RESOLUTION 2017-07

A RESOLUTION OF THE MAYOR AND COUNCIL OF THE TOWN OF FOUNTAIN HILLS, ARIZONA, APPROVING A DEVELOPMENT AGREEMENT BETWEEN THE TOWN AND PALISADES RESORTS, LLC.

BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE TOWN OF FOUNTAIN HILLS as follows:

SECTION 1. The Development Agreement between the Town of Fountain Hills and Palisades Resorts, LLC is hereby approved in substantially the form and substance attached hereto as Exhibit A and incorporated herein by reference.

SECTION 2. The Mayor, the Town Manager, the Town Clerk and the Town Attorney are hereby authorized and directed to execute all documents and take all steps necessary to carry out the purpose and intent of this Resolution.

PASSED AND ADOPTED by the Mayor and Council of the Town of Fountain Hills, Arizona, March 16, 2017.

FOR THE TOWN OF FOUNTAIN HILLS:

Linda M. Kavanagh, Mayor

ATTESTED TO:

Bevelyn J. Bender, Town Clerk

REVIEWED BY:

Grady E. Miller, Town Manager

APPROVED AS TO FORM:

Andrew J. McGuire, Town Attorney

EXHIBIT A
TO
RESOLUTION 2017-07

[Development Agreement]

See following pages.

WHEN RECORDED RETURN TO:

Town of Fountain Hills
ATTENTION: TOWN CLERK
16705 East Avenue of the Fountains
Fountain Hills, AZ 85268

==========

DEVELOPMENT AGREEMENT FOR

COPPERWYND RESORT EXPANSION

==========

TOWN OF FOUNTAIN HILLS, ARIZONA,
An Arizona municipal corporation

AND

PALISADES RESORTS, LLC
A Delaware limited liability company

DEVELOPMENT AGREEMENT BETWEEN THE TOWN OF FOUNTAIN HILLS AND PALISADES RESORTS, LLC (COPPERWYND RESORT EXPANSION)

This Development Agreement (the "Agreement") is entered into as of March 16, 2017 (the "Effective Date"), by PALISADES RESORTS, LLC, a Delaware limited liability company ("Palisades"), and the TOWN OF FOUNTAIN HILLS, an Arizona municipal corporation ("Town"), which are referred to collectively herein as the "Parties" or individually as a "Party."

RECITALS

A. Arizona Revised Statutes § 9-500.05 authorizes Town to enter into a development agreement with a landowner or other person having an interest in real property located in the Town.

B. Palisades owns that certain resort property located at 13225 N. Eagle Ridge Drive, Fountain Hills, Arizona, upon which it operates a resort with 32 guest rooms, a restaurant, tennis facilities and a fitness club (the "Existing Resort"). The Existing Resort consists of approximately 16.5 acres and is more particularly described in attached Exhibit A (the "Property").

C. Palisades acquired the Property in February 2015, and currently operates the Existing Resort on the Property.

D. Palisades intends to further develop and expand the Existing Resort on the Property to include up to a total of approximately 300 additional rooms to be operated as a branded hotel of a quality consistent with hotels bearing the Mobil Four-Star rating (the "New Hotel"), a pool pavilion, a casual dining restaurant, revisions to tennis courts, a spa expansion, and additional meeting and event space (collectively, the "Project"). The architectural design of the buildings and the quality of the construction will be consistent with the Town's standards and the Conceptual Site Plan, as described below.

E. The Town desires that the Existing Resort be expanded on the Property, and has determined that encouraging the expansion of the Existing Resort pursuant to this Agreement will result in significant planning, economic and other public purpose benefits to the Town and its residents by, among other things (i) the expansion of the Existing Resort in a manner consistent with the Town's General Plan, (ii) an increase in sales tax revenues to the Town arising from or relating to the expansion of the Existing Resort; and (iii) the creation of new jobs and otherwise enhancing the economic welfare of the residents of the Town.

F. In the furtherance of the contemplated expansion of the Existing Resort, the Parties desire for the Town to approve a rezoning of the Property from its current R-5 PUD zoning to Planned Area Development (the "PAD Rezoning"), pursuant to Chapter 23 of the Zoning Ordinance of the Town of Fountain Hills (the "Zoning Ordinance").

G. The Parties understand and acknowledge that the ultimate development of the Project on the Property is an undertaking of such magnitude that Palisades requires assurances from the Town that Palisades will have the ability to complete the development of the Project as contemplated by this Agreement. The Parties further understand and acknowledge that the

Town seeks assurances from Palisades that Palisades will complete the Project with the New Hotel on the Property in accordance with this Agreement, including the conceptual site plan attached hereto as Exhibit B-1 and incorporated herein by reference (the "Conceptual Site Plan"), in compliance with the PAD Rezoning for the Property, and in accordance with the Town's ordinances and codes.

H. The Parties understand and acknowledge that Palisades contemplates that the Project will be constructed in three phases pursuant to the Phasing Plan attached hereto as Exhibit B-2 and incorporated herein by reference (the "Phasing Plan"). Phase 1 detail, Phase 2 detail and Phase 3 detail are set forth in Exhibit B-3, Exhibit B-4 and Exhibit B-5, respectively, each of which is incorporated herein by reference. Additionally, conceptual elevation details for Phase 1, Phase 2 and Phase 3 are set forth in Exhibit B-6, Exhibit B-7 and Exhibit B-8, respectively, each of which is incorporated herein by reference.

I. The Parties understand and acknowledge that this Agreement is a "Development Agreement" within the meaning of and entered into pursuant to the terms of ARIZ. REV. STAT. § 9-500.05, in order to facilitate the property development of the Property by providing for, among other things (i) conditions, terms, restrictions and requirements for the Property by the Town and (ii) other matters related to the Project. The terms of this Agreement will constitute covenants running with the Property as more fully described herein.

AGREEMENT

NOW THEREFORE, in consideration of the foregoing introduction and recitals, the promises contained in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which the Parties hereby acknowledge, the Parties hereto agree as follows:

1. **Effective Date and Term**. This Agreement shall be effective only upon the execution by both Parties and upon approval of the PAD Rezoning by the Town Council of the Town of Fountain Hills (the "Town Council"). Notwithstanding the date upon which this Agreement is executed and the date the Town Council approves the PAD Rezoning, for the purposes of calculating the Term (as defined below) of this Agreement, the Effective Date set forth above shall be deemed the first day of this Agreement. Palisades, its successors and assigns, shall have the right to implement development on the Property in accordance with this Agreement for a period of 10 years from the Effective Date. However, unless terminated by the Town pursuant to Section 9 hereof prior to the expiration of such initial 10-year period, this Agreement may be extended for an additional period of 10 years in the Town Council's sole direction, at the end of which time (which shall, in the aggregate, be 20 years), this Agreement shall automatically terminate as to the Property without the necessity of any notice, agreement or recording by or between the Parties (the "Term"); provided, however, that provisions of this Agreement that specifically survive the termination of this Agreement shall remain in full force and effect, subject only to the termination provisions herein specifically related thereto; provided further, however, that if Palisades fails to materially fulfill any portion of its obligations as set forth in Section 8 below by the deadline for performance associated with each such obligation, this Agreement shall immediately terminate upon expiration of the applicable cure period without further act by the Town Council.

2. **PAD Rezoning; Conceptual Site Plan**.

2.1 PAD Rezoning. Pursuant to the PAD Rezoning, dated March 16, 2017, and for the duration of this Agreement, the Town shall be restricted from changing, restricting or limiting the rights of Palisades or its successors in interest and assigns to develop the Property in accordance with this Agreement and the PAD Rezoning. The Parties acknowledge and agree that approval of the PAD Rezoning by the Town Council shall be a condition precedent to the effectiveness of this Agreement and to the Parties' respective rights and obligations hereunder. Nothing in this Section 2.1 or in this Agreement shall affect the Town Council's absolute discretion to approve or deny the proposed PAD Rezoning or any future amendments thereto.

2.2 Conceptual Site Plan. The Town hereby approves the Conceptual Site Plan attached hereto as Exhibit B-1. Palisades acknowledges and agrees that such Conceptual Site Plan is intended to convey the overall land-use plan for the Project for the purposes of this Agreement. The Conceptual Site Plan includes, at a minimum: the layout, height, and percentage mix of uses for all buildings on the Project site; the locations and number of spaces, loading areas and basic site circulation of all Project parking areas; and architectural renderings showing general color pallets and conceptual building design.

2.3 Phasing Plan. Palisades intends to construct the Project in three phases, as shown on Exhibit B-2. Specifically, Palisades intends that Phase 1 shall include design and construction of approximately the first 128 additional rooms and approximately 9,800 square feet of convention space, as shown on Exhibit B-3; Phase 2 shall include design and construction of up to 60 additional rooms, as shown on Exhibit B-4; and Phase 3 shall include design and construction of up to 112 additional rooms, as shown on Exhibit B-5. Uses for the additional supporting areas to be added include a pool pavilion, a casual dining restaurant, possible tennis courts, a possible spa expansion, and additional meeting and event space. The Parties agree that such additional supporting areas shall be included in Phase 1, Phase 2 or Phase 3 substantially as depicted on Exhibit B-3, Exhibit B-4 and Exhibit B-5, respectively. Palisades shall seek approval of the Town Council for any "substantial alteration" of the phasing as appropriate to support the build-out of the additional guest rooms and as set forth in Exhibit B-3, Exhibit B-4 and Exhibit B-5, which approval of such substantial alterations may be withheld for any reason. For purposes of this Section 2.3, a "substantial alteration" means (A) a deviation of more than 20% of the number of guest rooms for any phase or (B) a change in phase or a change in size of more than 20% of total square feet for the convention space. The Parties agree that Palisades shall not be required to submit for approval of the Town Council any alteration to the phasing depicted herein that is not a substantial alteration, but such changes shall be reflected on revised exhibits to this Agreement. Any modifications to the phasing plan shall be attached hereto as substitute exhibits. The Town hereby approves: (A) the Phasing Plan attached hereto as Exhibit B-2, and (B) the phasing detail for Phase 1, Phase 2 and Phase 3, as set forth in Exhibit B-3, Exhibit B-4 and Exhibit B-5, respectively.

2.4 Consistency with Exhibits. The Town hereby approves the Conceptual Elevation Detail for Phase 1, Phase 2 and Phase 3, attached hereto as Exhibit B-6, Exhibit B-7 and Exhibit B-8 respectively. Palisades' development of the Project must be consistent with the conceptual elevations in Exhibit B-6, Exhibit B-7 and Exhibit B-8. Any substantial change to the elevation details in Exhibit B-6, Exhibit B-7 and Exhibit B-8 must have prior Town Council approval.

2.5 New Hotel Requirements. The New Hotel shall be of a quality equivalent to a rating of not less than four stars by the Mobil Travel Guide with a quality of materials and finishes consistent with the renderings included in Exhibit B-6, Exhibit B-7 and Exhibit B-8, including conference facilities, on-site food service, 24-hour room service, high-speed internet services and other amenities typically offered by hotels bearing the Mobil Four-Star rating (the "Hotel Quality Requirements"). Palisades has specifically committed to the Town that the New Hotel shall meet the Hotel Quality Requirements. If, at any time during the Term, the New Hotel ceases operation entirely or ceases operating under its then-current brand (such date is referred to herein as a "Cessation Date"), Palisades, its successors and assigns, shall (i) immediately notify the Town of such discontinued operation, (ii) immediately commence securing a replacement hotel meeting the Hotel Quality Requirements (the "Replacement Hotel"), and (iii) shall secure such Replacement Hotel and such Replacement Hotel operator shall open the Replacement Hotel (under the name of such hotel chain as shall be acceptable to the Town) for business within 90 days from the Cessation Date.

3. **Height Requirements**. The PAD Rezoning is intended to modify the requirements of Section 16.11 of the Zoning Ordinance to allow for a portion of the buildings in the Project, as depicted in greater detail in the Phase 1 Conceptual Elevation Detail in Exhibit B-6, the Phase 2 Conceptual Elevation Detail in Exhibit B-7, and the Phase 3 Conceptual Elevation Detail in Exhibit B-8, to exceed the height limitation set forth in Section 16.11, but in no event shall any portion of any of the buildings in the Project exceed 50' in height as measured from existing grade. Except as specifically modified in the PAD Rezoning, all height requirements of Section 16.11 of the Zoning Ordinance shall apply.

4. **Shared Parking**. Parking shall be provided on the basis of that certain Copperwynd Resort Expansion Parking Study date stamped March 5, 2017, by Kelly S. Fletcher of CivTech, Inc., as commissioned by Palisades (the "Parking Demand Study") and attached hereto as Exhibit C. The Parties acknowledge and agree that parking will be provided according to Section 18.11(B) of the Town's Zoning Ordinance on a Project-wide basis; provided that such requirements shall take into account shared parking throughout the Resort, as identified in the Parking Demand Study. Because trends in vehicle trips are changing rapidly and will likely continue to do so, the Parties further acknowledge and agree that Palisades shall have the right to commission, and submit for approval of the Town Council, revised parking studies for future phases of the Project; the Town Council may approve or deny such revised parking studies in its sole discretion. Palisades shall provide not less than 199 parking spaces for Phase 1 of the Project, 251 parking spaces for Phase 2 of the Project, and 347 parking spaces for Phase 3 of the Project (all figures cumulative), pursuant to the Parking Demand Study attached hereto as Exhibit C. The Town's approval of the modified parking requirements is conditioned upon Palisades implementing the interim parking improvements shown with each phase.

5. **Traffic**. Palisades engaged CivTech, Inc. to undertake a traffic impact analysis to assess (i) the Project's anticipated impacts on traffic circulation in the area surrounding the Project, and particularly Eagle Ridge Drive, and (ii) Palisades' proposed mitigation of those impacts (the "Traffic Study"), which Traffic Study shall be approved by the Town Engineer prior to any building permit for the Project and attached hereto as Exhibit D. Because trends in vehicle trips are changing rapidly and will likely continue to do so, the Parties further acknowledge and agree that Palisades shall have the right to commission, and submit for approval of the Town, revised traffic studies for future phases of the Project; the Town Council may approve or deny such revised traffic studies in its sole discretion. The Parties acknowledge and agree that the mitigation proposed in the Traffic Study for each phase of the Project is necessary and shall be completed according to the Traffic Study. Palisades agrees that its

mitigation shall include, prior to issuance of a certificate of occupancy for any Phase 2 improvements, (i) construction of turn pockets and traffic signal conduit as deemed necessary by the Town Engineer for the intersection of Palisades Boulevard and Eagle Ridge Drive, and (ii) contribution to the Town of Palisades' pro-rata share of the cost of the traffic signal for the intersection of Palisades Boulevard and Eagle Ridge Drive.

6. **Public Art Requirement**. Palisades shall provide the required contribution to the public art required for the Project as set forth in Subsection 19.05(I) of the Zoning Ordinance (the "Public Art Requirement"). If Palisades intends to provide publicly-accessible art on the Project site that conforms to the Public Art Requirement, such public art proposal must be submitted to the Town for confirmation of value by the Town.

7. **Conditions to Town's Obligations**. The Town shall be required to take actions contemplated by this Agreement only during such time as Palisades is fully performing its obligations as set forth in Sections 8.1 – 8.9 below.

8. **Palisades Responsibilities**. Palisades shall perform all of its duties as set forth in this Section 8 and according to the "Schedule of Performance" attached hereto as Exhibit E and incorporated herein by reference.

8.1 Zoning. Palisades agrees to develop the Project in accordance with the PAD Rezoning, dated March 16, 2017, and applicable to the Property.

8.2 Construction Documents. Palisades shall prepare and submit to the Town for review and approval the construction documents for the Project, in substantial conformity to (A) the approved PAD Rezoning, (B) the Conceptual Site Plan set forth in Exhibit B-1, (C) the Phasing Plan and Phasing Detail set forth in Exhibit B-2, Exhibit B-3, Exhibit B-4 and Exhibit B-5, (D) the Conceptual Elevation Detail for each phase set forth in Exhibit B-6, Exhibit B-7 and Exhibit B-8, (E) the Parking Demand Study set forth in Exhibit C, and (F) the Town ordinances and codes.

8.3 Building Permits. Palisades shall secure all grading, building and construction permits that may be required by the Town and any other governmental agency prior to starting any site grading or construction activities on the Property. The Town acknowledges and agrees that if Palisades' submittals for building permits meet the substantial conformity requirement set forth in Section 8.2 hereof and all Town codes, then the Development Services Director shall grant administrative zoning approval of the submittal, and the permits for the construction of the Project pursuant to the submittal will be issued in accordance with the Town's codes.

8.4 Construction on Property. Developer shall submit complete Construction Documents for the phases of the Project, receive building permits for vertical construction of the phases of the Project according to such construction documents and commence construction on the Project in accordance with the Schedule of Performance. For the purposes of this subsection, "commencement of construction" shall mean the mobilization of sufficient construction resources to the Property to complete the phases of the Project according to the Schedule of Performance and the Town's codes and ordinances.

8.5 Third Party Inspection. Palisades acknowledges and agrees and understands that the Town's resources may prevent plan review and inspection services to occur within the review time period desired by Palisades in connection with the Project, in which

case the Town shall retain an outside consultant to perform such tasks on the Town's behalf. In such event, Palisades agrees to pay the direct costs incurred by the Town resulting from its contract for the services of an outside firm to provide plan review and inspection in connection with the Project; provided that the Town shall perform all plan review and inspections related to fire safety and planning and zoning; the Fountain Hills Sanitary District will perform all plan review and inspections related to sanitary sewer; and EPCOR will perform all plan review and inspections related to the Project's potable water supply. If a third-party plan review and inspection firm is retained, Palisades shall only be responsible to pay the Town 10% of the Town's then-current building permit fee to cover the cost of the Town's planning and zoning/landscape plan review and inspection; the balance of the building permit fee is deemed paid when Palisades fulfills its obligations to pay the third-party plan review and inspection fees. Palisades shall pay the Town 100% of the cost of the plan review and inspection fees related to fire safety.

8.6 Phased Development. The Town acknowledges that Palisades plans to develop the Property in three phases generally set forth in Exhibit B-3, Exhibit B-4 and Exhibit B-5. The Town will review and approve the additional public infrastructure needs of each phase, beyond what currently exists on the Property (the "Public Infrastructure Improvements") as part of its approval of the site plan and construction documents of each phase, and as recommended based on applicable infrastructure studies commissioned in connection therewith (such studies, which shall include without limitation the Traffic Study, are referred to herein as the "Infrastructure Studies"). Palisades shall construct or cause to be constructed and installed any and all portions of the Public Infrastructure Improvements. The Town may require that Palisades construct portions of the Public Infrastructure Improvements not directly related to the phase being constructed by Palisades only if the Town Engineer reasonably concludes such Public Infrastructure Improvements are required to protect public health, safety or welfare.

8.7 Infrastructure Assurance. Palisades shall provide the Town with an irrevocable letter of credit in such form and amount as required by the Town Attorney to ensure that the installation of the Public Infrastructure Improvements necessary for development of the Property or other Public Infrastructure Improvements directly related to any building permit or permits will be completed (the "Public Infrastructure Assurances"). The Public Infrastructure Assurances will be required for a phase of the Project at the time permits are requested for any construction on that phase of the Project.

8.8 Dedication and Acceptance. Upon completion by Palisades of any Public Infrastructure Improvements, Palisades shall promptly (A) notify the Town in writing of the presumptive completion of such Public Infrastructure Improvement, and (B) dedicate to the Town, at no cost to the Town, such Infrastructure Improvements free and clear of all liens and encumbrances and in accordance with Town standards applicable to such dedication and acceptance. So long as such Public Infrastructure Improvements are constructed in accordance with Town standards, as verified by the inspection of the completed Public Infrastructure Improvements by the Town, all punch list items have been completed and the Public Infrastructure Improvements are free of any liens and encumbrances, the Town shall accept the Public Infrastructure Improvements. The Town shall notify Palisades, in writing, of the Town's acceptance of the Public Infrastructure Improvements. Acceptance of any Public Infrastructure Improvement is expressly conditioned upon Palisades providing a warranty for such Public Infrastructure Improvement consistent with the Town standards and as provided in Section 8.9 below. Subject to the limitation set forth in Section 8.9 below, after acceptance of any Public Infrastructure Improvements, the Town thereafter shall maintain, repair and operate such Public Infrastructure Improvements at its own cost, which obligation shall survive any termination of

this Agreement. Palisades, at no cost to the Town, shall dedicate, convey or obtain, as applicable, all rights-of-way, rights of entry, easements and/or other use rights, wherever located, as useful or necessary for the operation and maintenance of the Public Infrastructure Improvements as required by the Town.

8.9 Warranty. Palisades or its assignee shall give to the Town a one-year warranty for all Public Infrastructure Improvements or other such warranty as required by the Town Engineer, such warranty shall begin on the date that the Town accepts the Public Infrastructure Improvements as provided in this Section 8.9. Any material deficiencies in material or workmanship identified by Town staff during the one-year warranty period shall be brought to the attention of Palisades or its assignee that provided the warranty, which shall promptly remedy or cause to be remedied such deficiencies to the reasonable satisfaction of the Town. Continuing material deficiencies in a particular portion of the Public Infrastructure Improvements shall be sufficient grounds for the Town to require (A) an extension of the warranty for an additional one-year period, and (B) the proper repair of or the removal and reinstallation of, that portion of the Public Infrastructure Improvements that is subject to such continuing deficiencies. Regardless of whether the applicable warranty period has expired, Palisades agrees to repair any damage to the Public Infrastructure Improvements caused by Palisades' construction activities on the Property in respect of the Project. Nothing contained herein shall prevent the Town or Palisades from seeking recourse against any other third party for damage to the Public Infrastructure Improvements caused by such third party.

9. **Default**. If either Party fails to perform any obligation, and such Party fails to cure its nonperformance within 60 days after notice of nonperformance is given by the non-defaulting Party (the "Cure Period"), such Party will be in default. In the event of such default, the non-defaulting Party may terminate this Agreement and will have all remedies that are available to it at law or in equity including, without limitation, the remedy of specific performance. If the nature of the defaulting Party's nonperformance is such that it cannot reasonably be cured within 60 days, then the defaulting Party will have such additional periods of time as part of the Cure Period as may be reasonably necessary under the circumstances, provided the defaulting Party immediately commences to cure its nonperformance and thereafter diligently continues to completion the cure of its nonperformance. In no event shall any such Cure Period exceed 120 days.

10. **General**.

10.1 Notices and Requests. Any notice or other communication required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been duly given if: (A) delivered to the Party at the addresses set forth below; (B) deposited in the U.S. Mail, registered or certified, return receipt requested, to the address set forth below; or (C) given to a recognized and reputable overnight delivery service, to the address set forth below:

If to Town: Town of Fountain Hills
16705 East Avenue of the Fountains.
Fountain Hills, Arizona 85268
Attn: Town Manager

With a copy to: GUST ROSENFELD, P.L.C.
One East Washington, Suite 1600
Phoenix, Arizona 85004-2553
Attn: Andrew J. McGuire

If to Palisades: Palisades Resorts, LLC
13225 N. Eagle Ridge Drive
Fountain Hills, Arizona 85268
Attn: William D. Hinz II

With a copy to: ROSE LAW GROUP PC
7144 E. Stetson Drive, Suite 300
Scottsdale, Arizona 85251
Attn: Jordan R. Rose

or at such other address, and to the attention of such other person or officer, as any Party may designate in writing by notice duly given pursuant to this Section. Notices shall be deemed received: (A) when delivered to the Party; (B) three business days after being placed in the U.S. Mail, properly addressed, with sufficient postage; or (C) the following business day after being given to a recognized overnight delivery service, with the person giving the notice paying all required charges and instructing the delivery service to deliver on the following business day. If a copy of a notice is also given to a Party's counsel or other recipient, the provisions above governing the date on which a notice is deemed to have been received by a Party shall mean and refer to the date on which the Party, and not its counsel or other recipient to which a copy of the notice may be sent, is deemed to have received the notice.

10.2 Amendment. No amendment or waiver of any provision in this Agreement will be binding (A) on the Town unless and until it has been approved by the Town Council and has become effective or (B) on Palisades unless and until it has been executed by an authorized representative.

10.3 Headings; References. The headings herein are inserted only as a matter of convenience and for reference and in no way define, limit or describe the meaning of any provision or the scope or intent of this Agreement nor in any way affect the terms and provisions hereof.

10.4 Time of the Essence. Time is of the essence with regard to performance under the terms and provisions of this Agreement, and any amendment, modification or revision thereof, with respect to the actions and obligations of each person bound by the terms hereof.

10.5 Attorney's Fees. If either Party commences an action against the other to interpret or enforce any of the terms of this Agreement or because of the breach by the other Party of any of the terms hereof, the losing Party shall pay to the prevailing Party reasonable attorney's fees, costs and expenses, including expert witness fees, incurred in connection with the prosecution or defense of such action. For the purpose of this Agreement, the terms "attorney's fees, costs and expenses" shall mean the fees and expenses of counsel to the Parties hereto, which may include printing, duplicating and other expenses, air freight charges, and fees billed for law clerks, paralegals, librarians and others not admitted to the bar but performing services under the supervision of an attorney. The term "attorneys' fees, costs and expenses" shall also include, without limitation, all such fees and expenses incurred with respect to appeals, arbitrations and bankruptcy proceedings, and whether or not any action or

proceeding is brought with respect to the matter for which said fees and expenses were incurred.

10.6 Recordation. This Agreement shall be recorded in its entirety in the Maricopa County Recorder's Office not later than 10 days after it is fully executed by Palisades and the Town.

10.7 Choice of Law, Venue and Attorneys' Fees. The laws of the State of Arizona shall govern any dispute, controversy, claim or cause of action arising out of or related to this Agreement. The venue for any such dispute shall be Maricopa County, Arizona, and each Party waives the right to object to venue in Maricopa County for any reason. Neither Party shall be entitled to recover any of its attorneys' fees or other costs from the other Party incurred in any such dispute, controversy, claim, or cause of action, but each Party shall bear its own attorneys' fees and costs, whether the same is resolved through arbitration, litigation in a court, or otherwise.

10.8 Good Standing; Authority. Each Party represents and warrants that it is duly formed and validly existing under the laws of the State of Arizona with respect to Palisades, or a municipal corporation within Arizona with respect to the Town and that the individuals executing this Agreement on behalf of their respective Party are authorized and empowered to bind the Party on whose behalf each such individual is signing.

10.9 Assignment. The provisions of this Agreement are binding upon and shall inure to the benefit of the Parties, and all of their successors in interest and assigns. The rights and obligations of Palisades under this Agreement may be transferred or assigned, in whole or in part, by written instrument, to any subsequent owner of all or any portion of the Property, without consent from the Town. Notice of any transfer or assignment in accordance with this paragraph shall be provided to the Town within 10 days of such transfer or assignment. If any such transfer occurs within 90 days after the Effective Date, and following such transfer Palisades' successor or assign requests substantial modifications to this Agreement, Palisades agrees its successor or assign shall be responsible to pay the Town's legal fees related to the requested changes to this Agreement.

10.10 Third Parties. No term or provision of this Agreement is intended to, or shall be for the benefit of any person or entity not a Party hereto, and no such other person or entity shall have any right or cause of action hereunder.

10.11 No Partnership. None of the terms or provisions of this Agreement shall be deemed to create a partnership between or among the Parties hereto in their respective businesses or otherwise, nor shall it cause them to be considered joint ventures or members of any joint enterprise. Each Party hereto shall be considered a separate owner, and no Party hereto shall have the right to act as an agent for another Party hereto, unless expressly authorized to do so herein or by separate written instrument signed by the Party to be charged.

10.12 Waiver. No delay in exercising any right or remedy shall constitute a waiver thereof, and no waiver of any breach shall be construed as a waiver of any preceding or succeeding breach of the same or any other covenant, or condition of this Agreement. No waiver shall be effective unless it is in writing and is signed by the Party asserted to have granted such waiver.

10.13 Further Documentation. The Parties agree in good faith to execute such further or additional instruments and documents and to take such further acts as may be necessary or appropriate to fully carry out the intent and purpose of this Agreement.

10.14 Fair Interpretation. The Parties have been represented by counsel in the negotiation and drafting of this Agreement and this Agreement shall be construed according to the fair meaning of its language. The rule of construction that ambiguities shall be resolved against the Party who drafted a provision shall not be employed in interpreting this Agreement.

10.15 Counterparts. This Agreement may be executed in counterparts, each of which shall be an original but all of which shall constitute one and the same instrument.

10.16 Computation of Time. In computing any period of time under this Agreement, the date of the act or event from which the designated period of time begins to run shall not be included. The last date of the period so completed shall be included unless it is a Saturday, Sunday or legal holiday, in which event the period shall run until the end of the next day which is not a Saturday, Sunday or legal holiday. The time for performance of any obligation or taking any action under this Agreement shall be deemed to expire at 5:00 p.m. (local time, Phoenix, Arizona) on the last day of the applicable time period provided herein.

10.17 Conflict of Interest. Pursuant to ARIZ. REV. STAT. §§ 38-503 and 38-511, no member, official or employee of the Town shall have any personal interest, direct or indirect, in this Agreement, nor shall any such member, official or employee participate in any decision relating to this Agreement which affects his or her personal interest or the interest of any corporation, partnership or association in which he or she is, directly or indirectly, interested. This Agreement is subject to cancellation pursuant to the terms of ARIZ. REV. STAT. § 38-511.

10.18 Severability. Every provision of this Agreement is and will be construed to be a separate and independent covenant. If any provision in this Agreement or the application of the same is, to any extent, found to be invalid or unenforceable, the remainder of this Agreement or the application of that provision to circumstances other than those to which it is invalid or unenforceable will not be affected by that invalidity or unenforceability. Each provision in this Agreement will be valid and will be enforced to the extent permitted by law and the Parties will negotiate in good faith for such amendments of this Agreement as may be necessary to achieve its intent, notwithstanding such invalidity or unenforceability.

10.19 Covenant of Good Faith. In exercising their rights and in performing their obligations pursuant to this Agreement, the Parties will cooperate with one another in good faith to ensure the intent of this Agreement can be attained.

10.20 Estoppel Certificate. Upon Palisades' written request, the Town will execute, acknowledge and deliver to Palisades and all parties identified by Palisades, including without limitation assignees, transferees, tenants, purchasers, investors, lenders, and mortgagees, a written statement certifying (A) that this Agreement is unmodified and in full force and effect (or, if there have been modifications , that this Agreement is in full force and effect, as modified, and stating modifications) and (B) whether there are any existing breaches or defaults by Palisades then known to the Town under this Agreement, and if so, specifying the same. The Town will deliver the statement to Palisades or such requesting party within 15 days after request. The Town acknowledges that any such assignee, transferee, tenant, purchaser, investor, lender, or mortgagee may rely upon such statement as true and correct.

10.21 Runs with the Land. The covenants, conditions and restrictions in this Agreement create equitable servitudes upon every portion of the Property in favor of the Town. These covenants, conditions and restrictions run with the land and shall be prior, superior and non-subordinated to any and all encumbrances placed against the Property after this Agreement is recorded.

10.22 Exhibits. All exhibits attached hereto are incorporated herein by this reference as though fully set forth herein.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the date first written above.

TOWN:

THE TOWN OF FOUNTAIN HILLS, an Arizona municipal corporation

Linda M. Kavanagh, Mayor

ATTEST:

Bevelyn J. Bender, Town Clerk

ACKNOWLEDGEMENT

STATE OF ARIZONA)
) ss.
County of Maricopa)

On March 21, 2017, before me personally appeared Linda M. Kavanagh, the Mayor of the TOWN OF FOUNTAIN HILLS, an Arizona municipal corporation, whose identity was proven to me on the basis of satisfactory evidence to be the person who she claims to be, and acknowledged that she signed the above document on behalf of the Town of Fountain Hills.

JENNIFER LYONS
Notary Public, State of Arizona
Maricopa County
My Commission Expires
April 09, 2019

Notary Public

(Affix notary seal here)

[SIGNATURES CONTINUE ON FOLLOWING PAGE]

Palisades:

PALISADES RESORTS, LLC, a Delaware limited liability company

By: Crown Rock Ventures LLC, an Arizona limited liability company

By: _____
William D. Hinz II, Manager

ACKNOWLEDGEMENT

STATE OF ARIZONA)
) ss.
County of Maricopa)

On March 20, 2017, before me personally appeared William D. Hinz II, the Manager of Crown Rock Ventures, LLC, an Arizona limited liability company, as Manager of PALISADES RESORTS, LLC, a Delaware limited liability company, whose identity was proven to me on the basis of satisfactory evidence to be the person who he claims to be, and acknowledged that he signed the above document on behalf of Palisades Resorts, LLC.

_____
Notary Public

(Affix notary seal here)

SHAWN HUETTNER
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
February 15, 2020

EXHIBIT A
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Legal Description of the Property]

See following pages.

DESCRIPTION

PARCEL NO. 1

LOT 1 AND TRACT "A", COPPERWYND – FOUNTAIN HILLS, ACCORDING TO BOOK 460 OF MAPS, PAGE 8, RECORDS OF MARICOPA COUNTY, ARIZONA.

EXCEPT ALL OIL, GASES AND OTHER HYDROCARBON SUBSTANCES, COAL, STONE, METALS, FOSSILS AND FERTILIZERS OF EVERY NAME AND DESCRIPTION; TOGETHER WITH ALL URANIUM, THORIUM, OR ANY OTHER MATERIAL WHICH IS OR MAY BE DETERMINED TO BE PECULIARLY ESSENTIAL TO THE PRODUCTION OF FISSIONABLE MATERIALS, WHETHER OR NOT OF COMMERCIAL VALUE AS RESERVED BY DEED RECORDED IN DOCUMENT NO. 85–347787,

PARCEL NO. 2

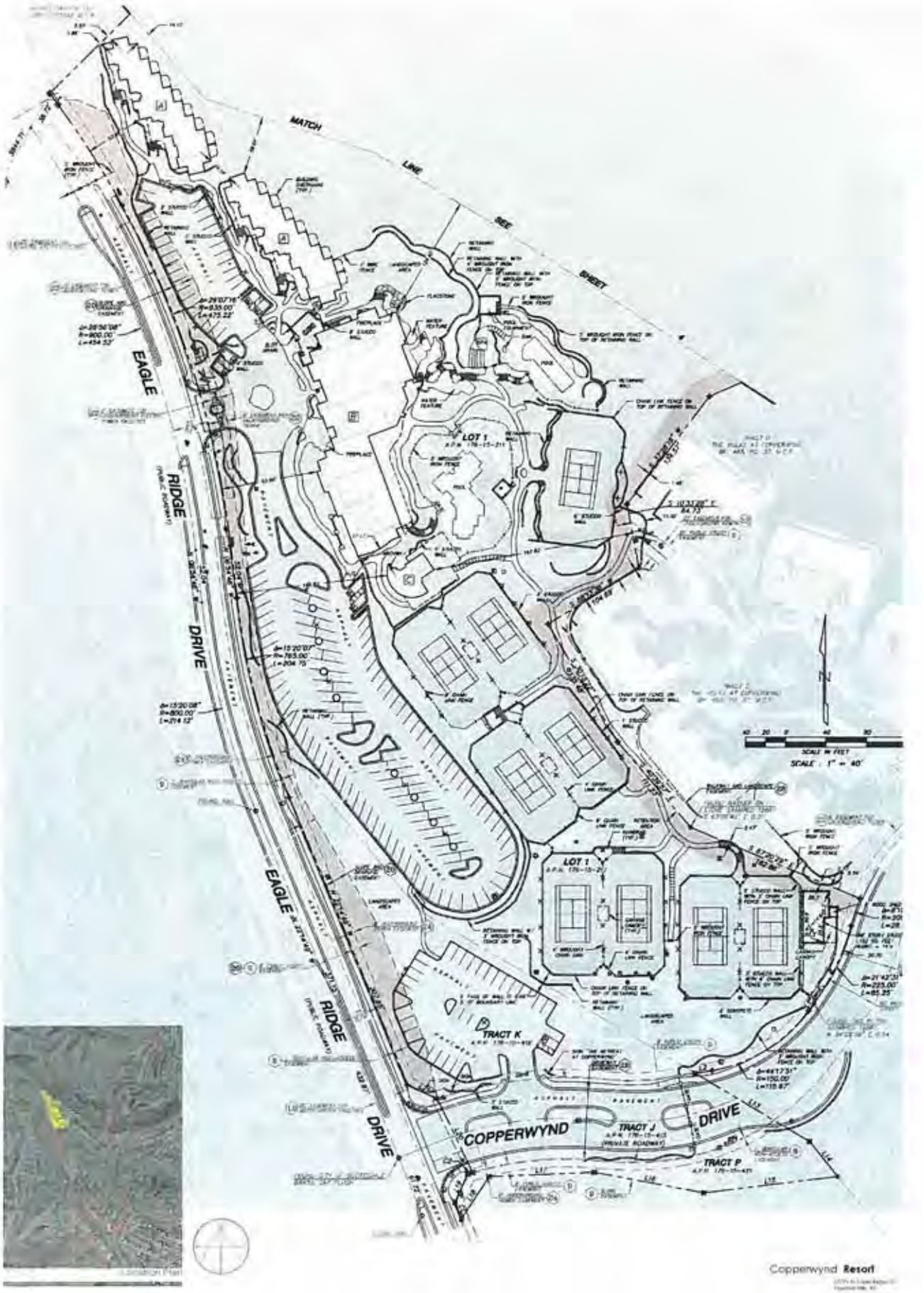
TRACTS J, K AND P, CORDILLERA AT COPPERWYND, ACCORDING TO BOOK 483 OF MAPS, PAGE 8, RECORDS OF MARICOPA COUNTY, ARIZONA, AND THEREAFTER AFFIDAVITS OF CORRECTION RECORDED IN DOCUMENT NO. 98–1112195, DOCUMENT NO. 2001–0906959 AND DOCUMENT NO, 2002–0695742.

EXCEPT ALL OIL, GASES AND OTHER HYDROCARBON SUBSTANCES, COAL, STONE, METALS, FOSSILS AND FERTILIZERS OF EVERY NAME AND DESCRIPTION; TOGETHER WITH ALL URANIUM, THORIUM, OR ANY OTHER MATERIAL WHICH IS OR MAY BE DETERMINED TO BE PECULIARLY ESSENTIAL TO THE PRODUCTION OF FISSIONABLE MATERIALS, WHETHER OR NOT OF COMMERCIAL VALUE AS RESERVED BY DEED RECORDED IN DOCUMENT NO. 85–347787.

PARCEL NO. 3

TRACT I, CORDILLERA AT COPPERWYND, ACCORDING TO BOOK 483 OF MAPS, PAGE 8, RECORDS OF MARICOPA COUNTY, ARIZONA, AND THEREAFTER AFFIDAVITS OF CORRECTION RECORDED IN DOCUMENT NO. 98–1112195, DOCUMENT NO. 2001–0906959 AND DOCUMENT NO. 2002–0695742.

EXCEPT ALL OIL, GASES AND OTHER HYDROCARBON SUBSTANCES, COAL, STONE, METALS, FOSSILS AND FERTILIZERS OF EVERY NAME AND DESCRIPTION; TOGETHER WITH ALL URANIUM, THORIUM, OR ANY OTHER MATERIAL WHICH IS OR MAY BE DETERMINED TO BE PECULIARLY ESSENTIAL TO THE PRODUCTION OF FISSIONABLE MATERIALS, WHETHER OR NOT OF COMMERCIAL VALUE AS RESERVED BY DEED RECORDED IN DOCUMENT NO. 85–347787.



Location Plan

Copperwynd **Resort**

COPPERWYND
RESORT & CLUB

Existing Conditions

Conceptual Planning Package

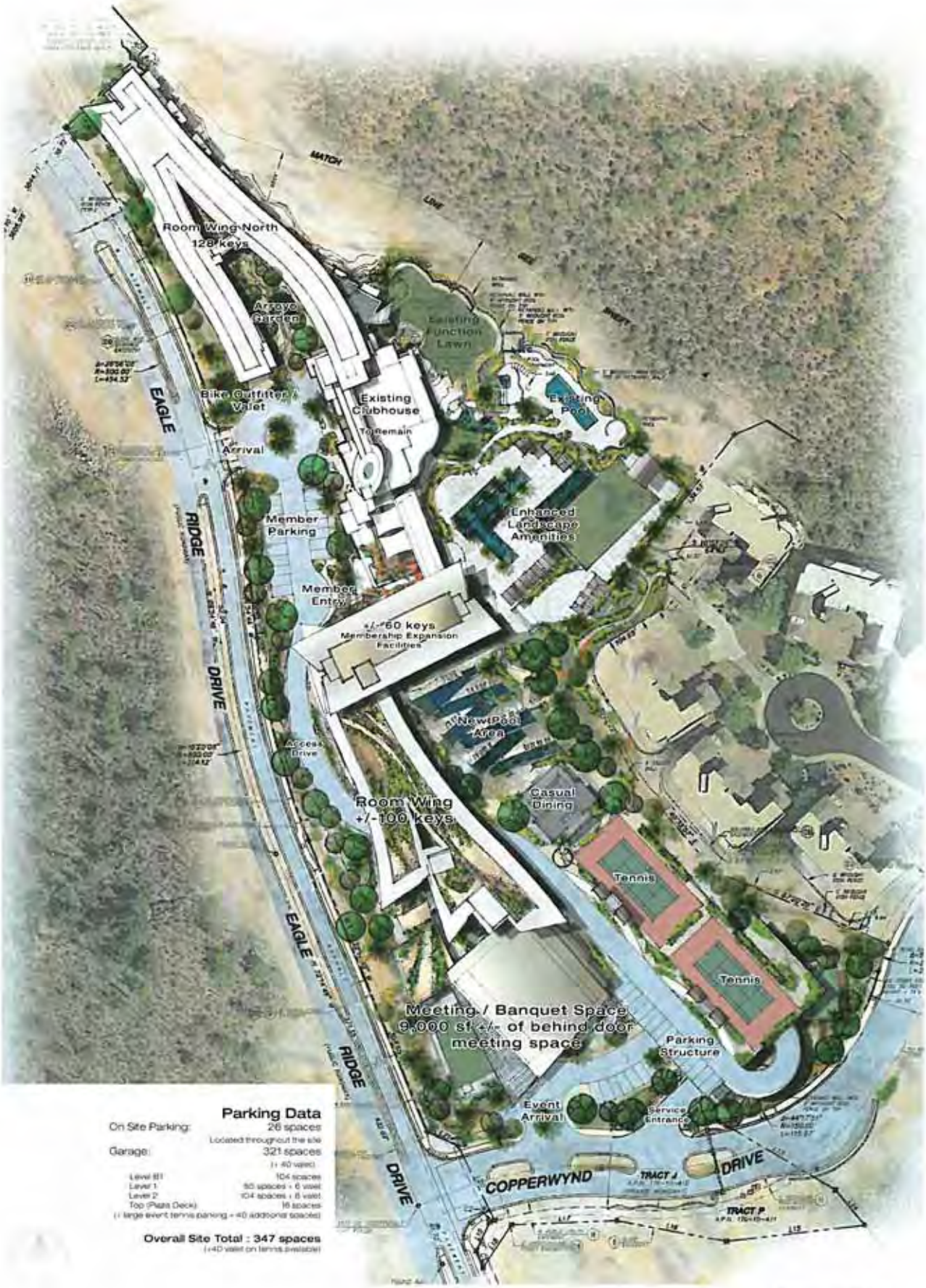
0 20 40 80 160

Allen

EXHIBIT B-1
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Conceptual Site Plan for the Property]

See following pages.



Parking Data

On Site Parking:	26 spaces
	Located throughout the site
Garage:	321 spaces
	(+ 40 valet)
Level B1	104 spaces
Level 1	80 spaces + 6 valet
Level 2	104 spaces + 8 valet
Top (Plaza Deck)	16 spaces

(+ large event tennis parking + 40 additional spaces)

Overall Site Total : 347 spaces
(+40 valet on tennis parking)

Copperwynd **Resort**

COPPERWYND
RESORT & CLUB

Overall Site Plan | Phases 1, 2 & 3

Conceptual Planning Package

0 20 40 80 140

EXHIBIT B-2
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phasing Plan for the Property]

See following pages.

Copperwynd Resort

COPPERWYND
RESORT & CLUB

Phasing Plan

Conceptual Planning Package

Allen Planning

EXHIBIT B-3
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phase 1 Detail for the Property]

See following pages.

Parking Yield: 199 spaces on Grade
+40 valet spaces
special event parking

Total Parking Provided: 239 spaces

Copperwynd **Resort**

COPPERWYND
RESORT & CLUB

Phase One Site Plan

Conceptual Planning Package

EXHIBIT B-4
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phase 2 Detail for the Property]

See following pages.

Parking Yield: 211 spaces on Grade
+40 valet spaces
special event parking

Total Parking Provided: 251 spaces

Copperwynd **Resort**

COPPERWYND
RESORT & CLUB

Phase Two Site Plan

Conceptual Planning Package

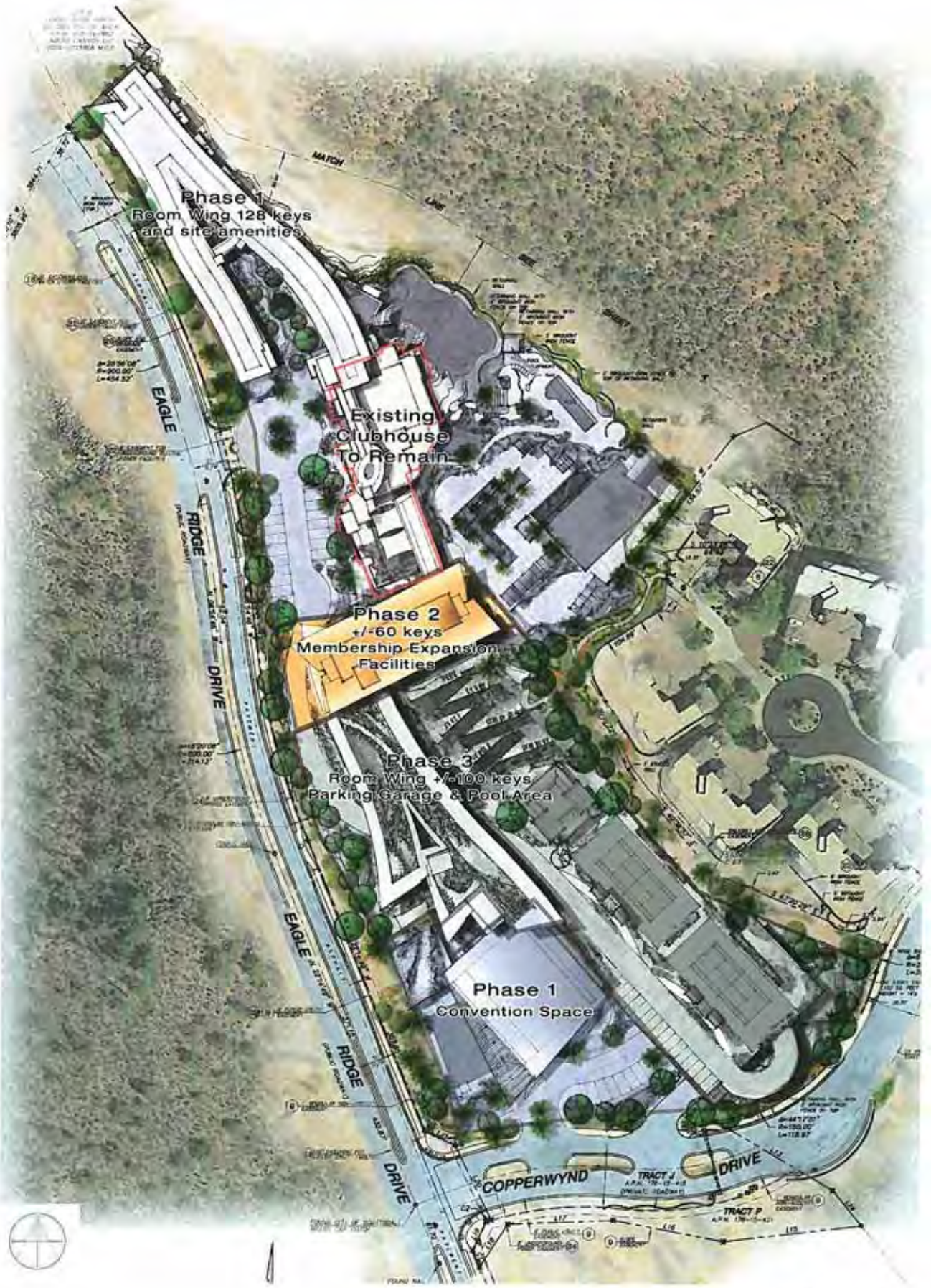
0 20 40 80 160

Alan Partners

EXHIBIT B-5
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phase 3 Detail for the Property]

See following pages.



Copperwynd Resort

COPPERWYND
RESORT & CLUB

Phasing Plan

Conceptual Planning Package

EXHIBIT B-6
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phase 1 Conceptual Elevation Detail]

See following pages.

Existing Hotel Wing **& Clubhouse**

Proposed Phase 1 Hotel Wing **& Clubhouse**

Hotel Arrival

Copperwynd **Resort**

COPPERWYND
RESORT & CLUB

Phase 1 Massing Imagery
Conceptual Planning Package

Allen Partners

Guest Wing Looking South

Arrival Looking North

Convention Space Arrival

East Elevation

West Elevation

East Facing Rooms

COPPERWYND
RESORT & CLUB

Phase 1 Massing Imagery
Conceptual Planning Package

Copperwynd **Resort**

Allen [illegible] Partners

EXHIBIT B-7
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phase 2 Conceptual Elevation Detail]

East Elevation

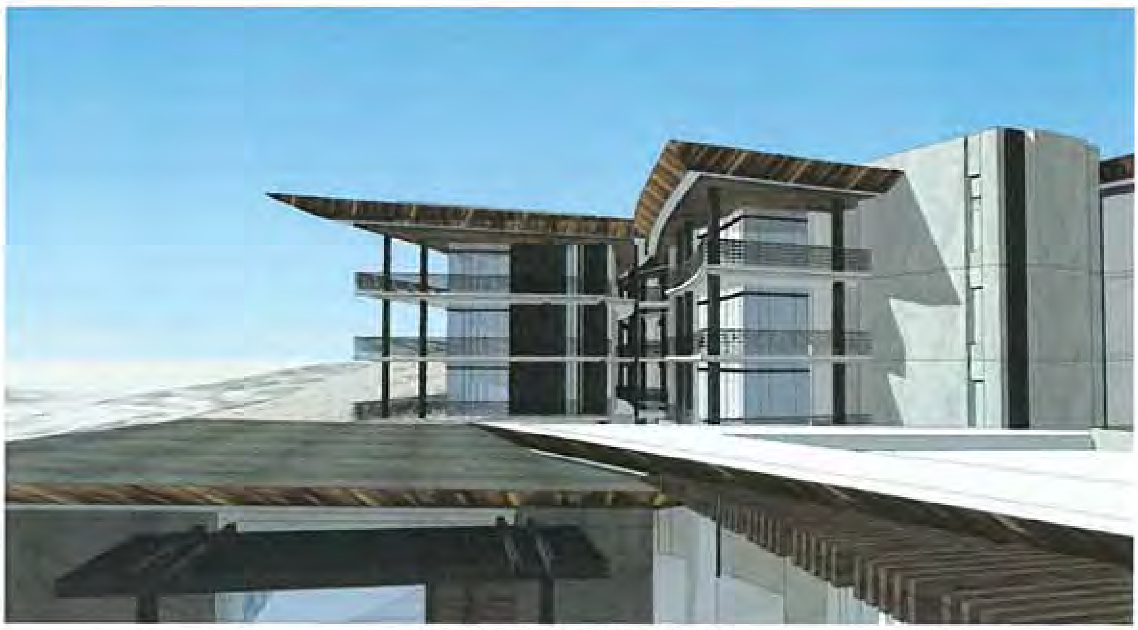
East Side from Lawn

West Elevation

EXHIBIT B-8
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Phase 3 Conceptual Elevation Detail]

Southwest Site Corner



Room Wing Above Conference

West Elevation

EXHIBIT C
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Parking Study]

See following pages.

COPPERWYND RESORT EXPANSION
PARKING STUDY
2nd Submittal

13225 N. Eagle Ridge Drive
Fountain Hills, Arizona

Prepared for:

Palisades Resorts, LLC
13225 N. Eagle Ridge Dr
Fountain Hills, AZ 85288

For Submittal to:
Town of Fountain Hills

Prepared By:

CivTech

CivTech, Inc.
10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
(480) 659-4250

Expires 12-31-2018

March 2017

CivTech Project No. 17-0210

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

CivTech has been retained to prepare a Parking Study for the CopperWynd Resort expansion in Fountain Hills, Arizona. A parking study has been prepared to analyze the needs of the CopperWynd Resort with the proposed redevelopment. Redevelopment is proposed in phases and will consist of a total of 300 rooms and 9,850 square feet of banquet/meeting space at full build-out (Phase 3). A restaurant and fitness/tennis club are currently on-site and will remain with the redevelopment.

The following conclusions and recommendations have been documented in this study:

- Renovations to the CopperWynd Resort is planned in phases. Phase one will include adding resort rooms to the northern part of the property resulting in a total of 128 rooms. As part of Phase 1, 9,850 square feet of ballroom and meeting space will be constructed. The restaurant space will remain the same at 2,563 square feet. Phase 2 will add 60 rooms for a total of 188 rooms. Full build-out/Phase 3 will result in a total of 300 resort rooms. The parking demand for the existing restaurant and fitness/tennis club is included in the existing parking counts, which are utilized in the shared parking model. Off-site patronage of the restaurant and club is not expected to increase with the hotel expansion.

- Per the existing parking counts that were collected, the existing ratio of spaces per room for hotel guest parking was 0.62 spaces per room (18 parking spaces/29 rooms=0.62). Therefore, the parking demand for the guest rooms can be estimated to be less than the Town of Fountain Hills requirement of 1 space per room when calculating parking spaces for guests only. The employee and banquet/meeting space is calculated separately in this analysis per the Town's ratios. Off-site patronage of the restaurant and club is not expected to increase with the hotel expansion. As a result, the existing hourly parking counts for the members/restaurant collected on a weekday and Saturday are utilized in the parking model.

Phase 1

- Per the shared parking analysis, the peak parking demand for Phase 1 is 200 spaces on a weekday and 228 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 199 parking spaces are provided during Phase 1 (including 40 on the tennis courts). The provided parking spaces will be sufficient for typical hotel operations. Per an extensive study that CivTech completed for a valley resort, parking can be increased by 15% when providing full valet service. Therefore, when full occupancy and a large event occur, full valet service must be implemented 24-hours in advance to handle the extra parking. During full valet service, designated parking spaces for club members should be separated from the valet operations.

Phase 2

- Per the shared parking analysis, the peak parking demand for Phase 2 is 233 spaces on a weekday and 261 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 251 parking spaces are provided during Phase 2 (including 40 on the tennis courts). The provided parking spaces will be sufficient for typical hotel operations and is only short 10 spaces on a weekend with full occupancy and a large event. When full occupancy and an event occur, partial valet service must be implemented 24-hours in advance to handle the extra parking. During valet service, designated parking spaces for club members should be separated from the valet operations.

Phase 3

- Per the shared parking analysis, the peak parking demand for Phase 3 is 311 spaces on a weekday and 326 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 347 parking spaces are provided for Phase 3 at full build-out. In addition, there is an option of 40 spaces on the tennis courts. The provided parking spaces at Phase 3 are sufficient to handle full operation of the resort.

Comparison Table

- A comparison table of parking provided at similar resorts is included in **Appendix F**. Per the table, of the eight comparison resorts in Arizona, the average parking supply ratio is 1.30 parking spaces per key. The proposed CopperWynd Resort will have a parking supply ratio of 1.55 spaces per key in Phase 1, 1.34 spaces per key in Phase 2, and 1.16 spaces per key (not including tennis courts) in Phase 3.

- It is important to note that the average meeting/banquet space of the comparison resorts is 34,400 square feet, whereas the CopperWynd Resort is proposed with only 9,850 square feet of meeting/banquet space. It can be concluded that the lower meeting/banquet space would result in a lower parking demand per room count. The resorts with reported parking problems have significantly more meeting/banquet space and a low ratio of parking per KSF of meeting space (14.1 and 5.7). The CopperWynd Resort will consist of parking per KSF of meeting/banquet space ratios of 20.2, 25.5, 35.2 in Phase 1, Phase 2, and Phase 3 respectively. Per the *Fountain Hills Conference Resort & Spa Parking Study*, 25 parking spaces per KSF of meeting/banquet space is recommended. The CopperWynd Resort provides this ratio in Phase 2 and Phase 3. Full valet can be implemented if necessary during Phase 1 to accommodate large events.

INTRODUCTION

CivTech has been retained to prepare a Parking Study for the CopperWynd Resort expansion in Fountain Hills, Arizona. A location map is provided in **Figure 1**.

A parking study has been prepared to analyze the needs of the CopperWynd Resort with the proposed redevelopment. Redevelopment is proposed in phases and will consist of a total of 300 rooms and 9,850 square feet of banquet/meeting space at full build-out. A fitness and tennis club is currently on-site and will remain with the redevelopment.

EXISTING CONDITIONS

EXISTING LAND USE

The CopperWynd Resort is located at 13225 N. Eagle Ridge Road situated in the McDowell Mountains in Fountain Hills, Arizona. The existing resort and club comprises 32 resort rooms, a restaurant and a spa/fitness/tennis club. The club currently has approximately 300 members. Some of the members walk from the surrounding neighborhood. A site plan of the existing resort is included in **Appendix B**.

EXISTING PARKING

The existing site provides 193 parking spaces. An existing parking count was conducted by CivTech on Thursday February 2 and Saturday February 4. The parking count was separated into three areas (A, B & C). The upper lot, A, is mostly hotel parking. The middle lot, B, is where most of the club members and restaurant patrons park and the lower lot, C, is for employees. A member meeting was conducted at 9:00 AM on Thursday February 2, thus increasing the typical member parking demand during the morning.

Member attendance on Thursday February 2 was provided by the resort and is summarized in **Table 1**.

Table 1: Club Member Attendance

Thursday 2/2/17	Drivers	Walkers	Total
Morning (special members meeting)	33	11	44
Midday	11	6	17
Evening	6	0	6

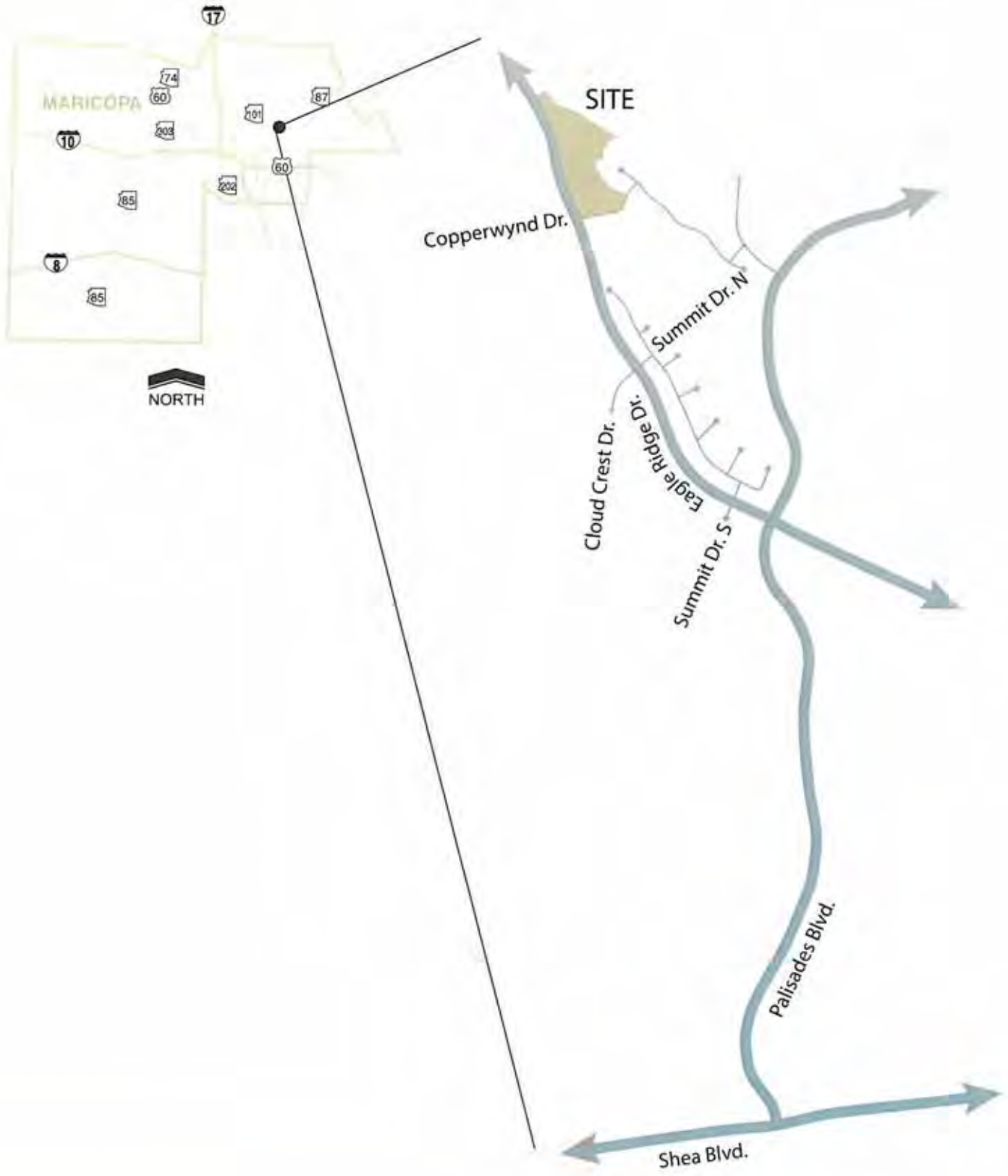


Figure 1: Vicinity Map

Source: CivTech 2017

Table 2 summarizes the occupancy rates that was obtained from the hotel on the day of the parking counts

Table 2: Existing Parking Counts

Date	Rooms	Guests	Occupancy
2/1/17	29	51	83%
2/2/17	29	54	83%
2/3/17	20	38	57%
2/4/17	17	29	49%

Per the data, the average room occupancy is 1.8 persons per room.

The parking counts are included in **Appendix C** and summarized in **Table 3.**

Table 3: Existing Parking Counts

Scenario	Thursday February 2, 2017	Saturday February 4, 2017
Upper Parking Lot A (Mostly Hotel)	18 spaces at 2:00 PM	28 spaces at 7:00 PM
Middle Parking Lot B (Club/Restaurant)	31 spaces at 2:00 PM	43 spaces at 7:00 PM
Lower Parking Lot C (Employee)	27 spaces at 2:00 PM	11 spaces at 7:00 PM
Total Resort & Club Peak Parking Demand	**76 spaces at 2:00 PM**	**82 spaces at 7:00 PM**

As indicated in **Table 3**, the maximum parking demand for the combination of resort, restaurant, and club on a weekday was 76 spaces at 2:00 PM. On Saturday, the maximum parking demand for the combination of resort, restaurant, and club was 82 spaces at 7:00 PM. Based on parking in the middle lot, B, the approximate peak parking demand for restaurant/club members on a weekday was 44 spaces and occurred at 9:00 AM during a member meeting. On Saturday, the approximate peak parking demand for restaurant/club members was 52 spaces at 10:00 AM per the count in the middle lot, B. Per the hotel, most members and restaurant patrons park in Lot B.

Lot A had a larger parking demand on a Saturday evening most likely due to restaurant patrons. In order to account for this existing restaurant parking, the total of Lot A & Lot B was utilized minus the estimated hotel parking. The hotel parking on Saturday was estimated to be 14 parking spaces per the 6:00 AM count in Lot A.

The resulting Club/Restaurant hourly parking demand utilized in the study are summarized in **Table 4** for a weekday and in **Table 5** on a Saturday.

Table 4: Existing Hourly Parking Demand – Thursday February 2, 2017

Beginning Hour	Hotel Guest	Member/Restaurant	Employee	Total
6:00 AM	18	8	1	27
7:00 AM	16	20	2	38
8:00 AM	15	33	10	58
9:00 AM	13	44	15	72
10:00 AM	9	36	23	68
11:00 AM	11	35	26	72
12:00 PM	11	35	26	72
1:00 PM	11	24	23	58
2:00 PM	18	31	27	76
3:00 PM	14	25	28	67
4:00 PM	10	27	24	61
5:00 PM	9	25	21	55
6:00 PM	10	34	16	60
7:00 PM	15	36	10	61
8:00 PM	18	17	8	43
9:00 PM	14	14	6	34

Table 5: Existing Hourly Parking Demand – Saturday February 4, 2017

Beginning Hour	Hotel Guest	Member/Restaurant	Employee	Total
6:00 AM	14	2	1	17
7:00 AM	14	8	4	26
8:00 AM	10	17	6	33
9:00 AM	8	49	11	68
10:00 AM	10	52	13	75
11:00 AM	8	40	18	66
12:00 PM	11	20	17	48
1:00 PM	9	25	18	52
2:00 PM	11	28	21	60
3:00 PM	6	28	23	57
4:00 PM	7	26	16	49
5:00 PM	10	19	18	47
6:00 PM	14	49	15	78
7:00 PM	14	57	11	82
8:00 PM	14	43	12	69
9:00 PM	14	41	6	61

PROPOSED HOTEL PROGRAMMING

PROPOSED SITE PLAN AND LAND USE

Renovations to the CopperWynd Resort is planned in phases. Phase one will include adding resort rooms to the northern part of the property resulting in a total of 128 rooms. As part of Phase 1, 9,850 square feet of ballroom and meeting space will be constructed. The restaurant space will remain the same at 2,563 square feet. Phase 2 will add 60 rooms for a total of 188 rooms. Full build-out/Phase 3 will result in a total of 300 resort rooms. The parking demand for the existing restaurant and club is included in the existing parking counts, which will be utilized in the shared parking model. Off-site patronage of the restaurant and club is not expected to increase with the hotel expansion.

Table 6 summarizes the proposed hotel programming.

Table 6: Proposed Hotel Programming

Land Use	Scenario		
	Phase 1	Phase 2	Phase 3 (Full Build-out)
Total Resort Rooms	128 rooms	188 rooms	300 rooms
Meeting/Banquet Space	9,850 SF	9,850 SF	9,850 SF
Restaurant (accounted for in existing parking counts)	2,563 SF	2,563 SF	2,563 SF
Spa, Fitness & Tennis Club (~300 members)	Remains as existing with ~300 members	Remains as existing with ~300 members	Remains as existing with ~300 members

PROPOSED PARKING PROVIDED

The current plan is to complete the expansion in three phases. A parking garage is proposed with Full Build-out. **Table 7** summarizes the proposed parking per each phase.

Table 7: Proposed Parking Provided

Scenario	Number of Provided Parking Spaces			
	Surface	Optional Valet on Tennis Courts	Garage	Total
Phase 1	159	40	0	**159 plus 40 on tennis courts for large event**
Phase 2	211	40	0	**211 plus 40 on tennis courts for large event**
Phase 3	26	40	321	**347 plus 40 on tennis courts for large event**

PROPOSED PARKING MODEL

TOWN OF FOUNTAIN HILLS REQUIREMENTS PER ZONING ORDINANCE

Base parking requirements were calculated per the Town of Fountain Hill's Zoning Ordinance (Chapter 7) for the proposed hotel programming and is summarized in **Table 5**. Per the base requirements, the proposed expansion at full build-out requires 548 parking spaces. The requirements are included in **Appendix D**.

Table 8: Town of Fountain Hills Base Requirements per Ordinance- Phase 3

Land Use	Size	Required Ratio	Required Spaces
Guest Rooms	300 rooms	1 space per 1 room	**300.00**
Employees	99 emp[1]	1 space per 2 emp	**49.5**
Private golf clubs, swimming, and tennis clubs	300 members	1 space per 5 members	**60.00**
Restaurant	2,653 SF	1 space per 50 SF	**51.26**
Conference/Meeting	9,850 SF	1 space per 4 persons	**98.50**
		Total	**560.00**

1. 0.33 emp/room was assumed as recommended in *ULI Shared Parking, 2nd Edition.*
2. Per ULI Shared Parking, 2nd Edition, a 90th percentile event has a density of 40 persons per 1,000 SF.

The 'Shared Parking' in Chapter 18 of the *Town of Fountain Hills Zoning Ordinance* is designed for the Town Center Commercial Zoning district, and not relevant for the different uses of a hotel/resort. For instance, percentages for member club & meeting rooms/ballrooms are not included in the Town's shared parking model.

For this analysis, the *ULI Shared Parking, 2nd Edition* and *ITE Parking Generation* were utilized for hourly percentages in a Shared Parking Model for the resort, which is discussed in a later section.

PARKING REDUCTIONS

Per the existing parking counts that were collected, the existing ratio of spaces per room for hotel guest parking was 0.62 spaces per room (18 parking spaces/29 rooms=0.62). Therefore, the parking demand for the guest rooms can be estimated to be less than the Town of Fountain Hills requirement of 1 space per room when calculating parking spaces for guests only.

The employee and banquet/meeting space is calculated separately in this analysis per the Town's ratios.

As discussed earlier, off-site patronage of the restaurant and club is not expected to increase with the hotel expansion. As a result, the existing hourly parking counts for the club members/restaurant collected on a weekday and Saturday are utilized in the parking model.

The mode split is the percentage of persons arriving at a destination in different modes of transportation. A portion of hotel and event guests and employees will arrive by taxi, shuttle, or ride share companies and need to be accounted for in the parking model. With the resort expansion, a hotel airport shuttle and a shuttle to surrounding attractions will be advertised and provided to the hotel guests.

The reductions are summarized in **Table 9, Table 10, and Table 11** for Phase 1, Phase 2, and Phase 3 respectively.

Table 9: Reduction in Peak Parking Demand – Phase 1 (128 Rooms)

Use	Base Demand	% Utilization/ Occupancy[4]	% Using Personal/Rental Vehicles (Modal Split)[5]	Vehicle Occupancy Rate[6]	Peak Parking Demand
128 Guest Rooms	230.4 guests[1]	100%	66%	1.9	80.03
Town of Fountain Hills Ratios					
Employees	42.24 emp[2]	1 space per 2 employees			21.12
Ballrooms & Meeting Space	394.00 attandees[3]	1 space per 4 persons			98.5
Existing Parking Counts					
Restaurant & Club	Existing Data				Weekday: 44 Weekend: 57
				TOTAL	**Weekday: 244** **Weekend: 257**

1. Per existing data, the hotel currently has 1.8 persons per room.
2. 0.33 emp/room was assumed as recommended in *ULI Shared Parking, 2nd Edition.*
3. Per *ULI Shared Parking, 2nd Edition*, a 90th percentile event has a density of 40 persons per 1,000 SF.
4. Utilization accounts for hotel occupancy, which is assumed as 100% for this parking model.
5. % Using personal vehicles accounts for Modal Split (The percentage is those guests arriving by personal/rental vehicles. The other guests arrive via other transportation such as taxi, ride sharing companies, or shuttle.)
6. Vehicle occupancy rate accounts for carpooling (including guests in separate rooms sharing a personal/rented vehicle)

The resulting ratio for guest parking is 0.625 (80.03 spaces/128 rooms=0.625), which corresponds to the existing data for the hotel. The other hotel uses, including employees, are calculated separately.

Table 10: Reduction in Peak Parking Demand – Phase 2 (188 Rooms)

Use	Base Demand	% Utilization/ Occupancy[4]	% Using Personal/Rental Vehicles (Modal Split)[5]	Vehicle Occupancy Rate[6]	Peak Parking Demand
188 Guest Rooms	338.4 guests[1]	100%	66%	1.9	117.55
Town of Fountain Hills Ratios					
Employees	62.4 emp[2]	1 space per 2 employees			31.02
Ballrooms & Meeting Space	394.00 attandees[3]	1 space per 4 persons			98.5
Existing Parking Counts					
Restaurant & Club	Existing Data				Weekday: 44 Weekend: 57
				TOTAL	**Weekday: 292** **Weekend: 305**

1. Per existing data, the hotel currently has 1.8 persons per room.
2. 0.33 emp/room was assumed as recommended in *ULI Shared Parking, 2nd Edition.*
3. Per *ULI Shared Parking, 2nd Edition*, a 90th percentile event has a density of 40 persons per 1,000 SF.
4. Utilization accounts for hotel occupancy, which is assumed as 100% for this parking model.
5. % Using personal vehicles accounts for Modal Split (The percentage is those guests arriving by personal/rental vehicles. The other guests arrive via other transportation such as taxi, ride sharing companies, or shuttle.)
6. Vehicle occupancy rate accounts for carpooling (including guests in separate rooms sharing a personal/rented vehicle)

The resulting ratio for guest parking is 0.625 (117.55 spaces/188 rooms=0.625), which corresponds to the existing data for the hotel. The other hotel uses, including employees, are calculated separately.

Table 11: Reduction in Peak Parking Demand – Phase 3 (300 Rooms)

Use	Base Demand	% Utilization/ Occupancy[4]	% Using Personal/Rental Vehicles (Modal Split)[5]	Vehicle Occupancy Rate[6]	Peak Parking Demand
300 Guest Rooms	540 guests[1]	100%	66%	1.9	187.58
Town of Fountain Hills Ratios					
Employees	99 emp[2]	1 space per 2 employees			49.5
Ballrooms & Meeting Space	394.00 attandees[3]	1 space per 4 persons			98.5
Existing Parking Counts					
Restaurant & Club	Existing Data				Weekday: 44 Weekend: 57
				TOTAL	**Weekday: 380 Weekend: 393**

1. Per existing data, the hotel currently has 1.8 persons per room..
2. 0.33 emp/room was assumed as recommended in *ULI Shared Parking, 2nd Edition.*
3. Per *ULI Shared Parking, 2nd Edition*, a 90th percentile event has a density of 40 persons per 1,000 SF.
4. Utilization accounts for hotel occupancy, which is assumed as 100% for this parking model.
5. % Using personal vehicles accounts for Modal Split (The percentage is those guests arriving by personal/rental vehicles. The other guests arrive via other transportation such as taxi, ride sharing companies, or shuttle.)
6. Vehicle occupancy rate accounts for carpooling (including guests in separate rooms sharing a personal/rented vehicle)

The resulting ratio for guest parking is 0.625 (187.58 spaces/300 rooms=0.625), which corresponds to the existing data for the hotel. The other hotel uses, including employees, are calculated separately.

SHARED PARKING ANALYSIS

Shared parking is defined as a parking space that can be used for two or more individual land uses without conflict. For instance, the individual land uses will have peaks at different times of the day and therefore can share parking spaces. To determine the total number of shared parking spaces required between different land uses, a shared parking model may be developed. Hourly percentages for each individual land use are utilized to estimate the overall peak parking demand accumulated for each hour of the day. The existing club member and restaurant hourly parking demand is also included in the shared parking analysis.

The 'Shared Parking' in Chapter 18 of the *Town of Fountain Hills Zoning Ordinance* is designed for the Town Center Commercial Zoning district, and not relevant for the different uses of a hotel/resort. For instance, percentages for member club & meeting rooms/ballrooms are not included in the Town's shared parking model.

For this analysis, the *ULI Shared Parking, 2nd Edition* and *ITE Parking Generation* was utilized for hourly percentages. *ULI Shared Parking, 2nd Edition* has specific methodology for Hotels, and specific hourly percentages for separate hotel uses are provided in Table 2-5 & 2-6.

The shared parking model worksheets are included in **Appendix E.** **Table 12** summarizes the results of the shared parking analysis for each phase.

Table 12: Shared Parking Analysis Results

Scenario	Peak Parking Demand per Shared Parking Analysis	
	Weekday	**Weekend**
	Without Full Valet	**Without Full Valet**
Phase 1		
Hotel & Meeting/Banquet	*166 at 6 PM*	*171 at 7 PM*
Existing Restaurant & Club	*34 at 6 PM*	*57 at 7 PM*
Phase 1 Total	**200 at 6 PM**	**228 at 7 PM**
Phase 2		
Hotel & Meeting/Banquet	*189 at 9 AM*	*204 at 7 PM*
Existing Restaurant & Club	*44 at 9 AM[1]*	*57 at 7 PM*
Phase 2 Total	**233 at 9 AM**	**261 at 7 PM**
Phase 3/Full Build-out		
Hotel & Meeting/Banquet	*267 at 9 AM*	*285 at 9 PM*
Existing Restaurant & Club	*44 at 9 AM[1]*	*41 at 9 PM*
Phase 3 Total	**311 at 9 AM**	**326 at 9 PM**

1. A special member meeting occurred on the day of the count increasing the typical morning demand of the member parking.

Phase 1

Per the shared parking analysis, the peak parking demand for Phase 1 is 200 spaces on a weekday and 228 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 199 parking spaces are provided during Phase 1 (including 40 on the tennis courts). The provided parking spaces will be sufficient for typical hotel operations.

Per an extensive study that CivTech completed for a valley resort, parking can be increased by 15% when providing full valet service. Therefore, when full occupancy

and a large event occur, full valet service must be implemented 24-hours in advance to handle the extra parking. During full valet service, designated parking spaces for club members should be separated from the valet operations.

Phase 2

Per the shared parking analysis, the peak parking demand for Phase 2 is 233 spaces on a weekday and 261 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 251 parking spaces are provided during Phase 2 (including 40 on the tennis courts). The provided parking spaces will be sufficient for typical hotel operations and is only short 10 spaces on a weekend with full occupancy and a large event. When full occupancy and an event occur, partial valet service must be implemented 24-hours in advance to handle the extra parking. During valet service, designated parking spaces for club members should be separated from the valet operations.

Phase 3

Per the shared parking analysis, the peak parking demand for Phase 3 is 311 spaces on a weekday and 326 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 347 parking spaces are provided for Phase 3 at full build-out. In addition, there is also the option of 40 spaces on the tennis courts. The provided parking spaces at Phase 3 are sufficient to handle full operation of the resort.

COMPARISON TO OTHER RESORTS

A comparison table of parking provided at similar resorts is included in **Appendix F**. The table is comprised of information that CivTech previously obtained along with comparable resorts from the *Fountain Hills Conference Resort & Spa Parking Study* prepared for Fountain Hills by the CK Group, Inc. Per the table, of the eight comparison resorts in Arizona, the average parking supply ratio is 1.30 parking spaces per key. The proposed CopperWynd Resort will have a parking supply ratio of 1.55 spaces per key in Phase 1, 1.34 spaces per key in Phase 2, and 1.16 spaces per key (not including tennis courts) in Phase 3.

It is important to note that the average meeting/banquet space of the comparison resorts is 34,400 square feet, whereas the CopperWynd Resort is proposed with only 9,850 square feet of meeting/banquet space. It can be concluded that the lower meeting/banquet space would result in a lower parking demand per room count. The resorts with reported parking problems have significantly more meeting/banquet space and a low ratio of parking per KSF of meeting space (14.1 and 5.7). The CopperWynd Resort will consist of parking per KSF of meeting/banquet space ratios of 20.2, 25.5, 35.2 in Phase 1, Phase 2, and Phase 3 respectively. Per the *Fountain Hills Conference Resort & Spa Parking Study*, 25 parking spaces per KSF of meeting/banquet space is recommended. The CopperWynd Resort provides this ratio in Phase 2 and Phase 3. Full valet can be implemented if necessary during Phase 1 to accommodate large events.

HOTEL PARKING PER ITE PARKING GENERATION

The parking demand for the hotel was also estimated utilizing *ITE Parking Generation, 4th Edition*. *Parking Generation* contains data collected by various transportation professionals for a wide range of different land uses. The data summarized in the report include average rates and equations that have been established correlating the relationship between an independent variable that describes the development size and parking demand for each categorized land use.

According to *ITE Parking Generation*, the description for Land Use Code 310, Hotel, is "hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants; cocktail lounges; meeting and banquet rooms or convention facilities; limited recreational facilities (pool, fitness center); and/or other retail and service shops." *ITE Parking Generation* also contains a land use category for a resort, however, the number of data points is small. **Table 13** summarizes the ITE rate for a Hotel (land use code 310). The trip generation worksheet is included in **Appendix G**.

Table 13: ITE Weekday Peak Period Parking Generation-Hotel

Land Use	Size	Weekday Peak Period Parking Demand 85th Percentile (1.08 vehicles per occupied room)	Provided Parking
Hotel (Land Use Code 310)	Phase 1 128 Occupied Rooms	139 parking spaces	199 parking spaces
Hotel (Land Use Code 310)	Phase 2 188 Occupied Rooms	204 parking spaces	251 parking spaces
Hotel (Land Use Code 310)	Phase 3 300 Occupied Rooms	324 parking spaces	347 parking spaces

Utilizing *ITE Parking Generation*, the 85th percentile weekday peak parking demand for Phase 1, Phase 2 and Phase 3 is 139 spaces, 204 spaces, and 324 spaces respectively. The proposed CopperWynd Resort is providing more spaces than estimated by the 'Hotel' land use in *ITE Parking Generation*. This is expected since member parking must also be considered.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been documented in this study:

- Renovations to the CopperWynd Resort is planned in phases. Phase one will include adding resort rooms to the northern part of the property resulting in a total of 128 rooms. As part of Phase 1, 9,850 square feet of ballroom and meeting space will be constructed. The restaurant space will remain the same at 2,563 square feet. Phase 2 will add 60 rooms for a total of 188 rooms. Full build-out/Phase 3 will result in a total of 300 resort rooms. The parking demand for the existing restaurant and fitness/tennis club is included in the existing parking counts, which are utilized in the shared parking model. Off-site patronage of the restaurant and club is not expected to increase with the hotel expansion.

- Per the existing parking counts that were collected, the existing ratio of spaces per room for hotel guest parking was 0.62 spaces per room (18 parking spaces/29 rooms=0.62). Therefore, the parking demand for the guest rooms can be estimated to be less than the Town of Fountain Hills requirement of 1 space per room when calculating parking spaces for guests only. The employee and banquet/meeting space is calculated separately in this analysis per the Town's ratios. Off-site patronage of the restaurant and club is not expected to increase with the hotel expansion. As a result, the existing hourly parking counts for the members/restaurant collected on a weekday and Saturday are utilized in the parking model.

Phase 1

- Per the shared parking analysis, the peak parking demand for Phase 1 is 200 spaces on a weekday and 228 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 199 parking spaces are provided during Phase 1 (including 40 on the tennis courts). The provided parking spaces will be sufficient for typical hotel operations. Per an extensive study that CivTech completed for a valley resort, parking can be increased by 15% when providing full valet service. Therefore, when full occupancy and a large event occur, full valet service must be implemented 24-hours in advance to handle the extra parking. During full valet service, designated parking spaces for club members should be separated from the valet operations.

Phase 2

- Per the shared parking analysis, the peak parking demand for Phase 2 is 233 spaces on a weekday and 261 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 251 parking spaces are provided during Phase 2 (including 40 on the tennis courts). The provided parking spaces will be sufficient for typical hotel operations and is only short 10 spaces on a weekend with full occupancy and a large event. When full occupancy and an event occur, partial valet service must be implemented 24-hours in advance to handle the extra parking. During valet service, designated parking spaces for club members should be separated from the valet operations.

Phase 3

- Per the shared parking analysis, the peak parking demand for Phase 3 is 311 spaces on a weekday and 326 spaces on a Saturday. This parking demand is based on 100% occupancy and a full event. 347 parking spaces are provided for Phase 3 at full build-out. In addition, there is an option of 40 spaces on the tennis courts. The provided parking spaces at Phase 3 are sufficient to handle full operation of the resort.

Comparison Table

- A comparison table of parking provided at similar resorts is included in **Appendix F**. Per the table, of the eight comparison resorts in Arizona, the average parking supply ratio is 1.30 parking spaces per key. The proposed CopperWynd Resort will have a parking supply ratio of 1.55 spaces per key in Phase 1, 1.34 spaces per key in Phase 2, and 1.16 spaces per key (not including tennis courts) in Phase 3.

- It is important to note that the average meeting/banquet space of the comparison resorts is 34,400 square feet, whereas the CopperWynd Resort is proposed with only 9,850 square feet of meeting/banquet space. It can be concluded that the lower meeting/banquet space would result in a lower parking demand per room count. The resorts with reported parking problems have significantly more meeting/banquet space and a low ratio of parking per KSF of meeting space (14.1 and 5.7). The CopperWynd Resort will consist of parking per KSF of meeting/banquet space ratios of 20.2, 25.5, 35.2 in Phase 1, Phase 2, and Phase 3 respectively. Per the *Fountain Hills Conference Resort & Spa Parking Study*, 25 parking spaces per KSF of meeting/banquet space is recommended. The CopperWynd Resort provides this ratio in Phase 2 and Phase 3. Full valet can be implemented if necessary during Phase 1 to accommodate large events.

LIST OF REFERENCES

Parking Generation, 4rd Edition, Institute of Transportation Engineers, Washington, D.C., 2010.

Smith, Mary S. *Shared Parking, Second Edition*, Washington, D.C.: ULI-the Urban Land Institute and the International Council of Shopping Centers, 2005.

Town of Fountain Hills Zoning Ordinance Chapter 7

TECHNICAL APPENDICES

APPENDIX A: REVIEW COMMENTS (RESERVED)

APPENDIX B: SITE PLAN

APPENDIX C: EXISTING PARKING COUNTS

APPENDIX D: TOWN OF FOUNTAIN HILLS ZONING ORDINANCE CHAPTER 7

APPENDIX E: SHARED PARKING MODEL

APPENDIX F: COMPARISON TABLE OF SIMILAR RESORTS

APPENDIX G: HOTEL PARKING PER ITE PARKING GENERATION

APPENDIX A

REVIEW COMMENTS (RESERVED)

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
1.	Please clarify why there are 193 existing parking spaces (per paragraph 4, page 2) yet only 199 spaces are being proposed for Phase 1 (Table 4: Proposed Parking Provided), which is increasing the rooms and conference area, thus increasing demand considerably.	Per the recent weekday parking count conducted on February 2, the peak parking demand was 76, and the occupany rate was 83%. Therefore, the resort is currently overparked. While parking demand will be increased, there is an existing surplus of parking spaces.
2.	Please include Chapter 18 of the Town Zoning Ordinance in Appendix D, since this is where shared parking is addressed.	The 'Shared Parking' in Chapter 18 of the Town Zoning Ordinance is designed for the Town Center Commerical Zoning district, and not relevant for the different uses of a hotel/resort. For instance, percentages for member club & meeting rooms/ballrooms, are not included in the Town's shared parking model. Moreover, it does not account for internal capture among the hotel uses. The *ULI Shared Parking, 2nd Edition* has specific methodology for Hotels, and specific hourly percentages for separate hotel uses are provided in Table 2-5 & 2-6. *ITE Parking Generation* also has hourly percentages.
3.	Please amend Table 5: Town of Fountain Hills Base Requirements using shared parking requirements in Section 18.11.C of the Zoning Ordinance.	Refer to response for **Item 2** above.
4.	100% valet service is not realistic, given the limited space and how long it would take to move veryone's cars around to get a particular car out. Additionally, not every patron may want to use valet. Please provide supporting references for the valet parking reduction of 15% that is being requested.	Due to the increased parking provided, 100% valet service is no longer required during Phase 3. A 100% occupancy and 100% event utilization scenario on the weekend can be accomodated during Phase 3. During Phase 1, full valet may be required on the weekends for a 100% Occupancy and 100% Event utilization scenario and Phase 2 would require a partial valet. Valet is not required for typical operations. CivTech previously conducted a study at a valley resort that resulted in the conclusion that full valet can increase parking by 15%. There are hotels in the valley that have full valet operations. Downtown hotels often operate with full valet only.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
5.	I'd like to see more details of the "Shared Parking" ULI methodology they used-the information is sparse. Perhaps the ITE Parking Generation 4th Edition could be of assistance, too - in particular 330-Resort Hotel.	The complete Shared Parking Analysis table is included in the Appendix. There is a section on Hotels (page 82) in the Urban Land Institute Shared Parking that specifies the methodology for hotels. Table 2-5 & 2-6 of the *Urban Land Insitute Shared Parking* and *ITE Parking Generation* contain recommended time-of-day factors that are specific to hotels that were utilized for the shared parking model. The data for *ITE Parking Generation* Land Use Code 330 is only based on 5 studies and is therefore not reliable. It should only be used in the absence of other information. The *ITE Parking Generation* Hotel land use rates provide general parking demand rates that are all encompassing meaning that hotel guests, employees, meeting rooms, spa and restaurant space are all considered under one rate. Parking demand can vary greatly depending on restaurant/bar characteristics, meeting space, etc. (According to *ITE Parking Generation*, the Average Rate for Land Use 310 (Hotel), which includes hotels with conference space, yields a weekday parking demand of 267 spaces based on a 300 room hotel. This is less than the 303 weekday spaces estimated by our parking model.) When the different uses of a hotel/resort are known, it is best practice to calculate them separately.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
6.	Please provide a survery of several local, similar resorts for parking ratios/calculations and any "problem" these sites may have (providing this information was mentioned a few times by the applicant in our meetings).	A table summarizing a comparison of resort data that CivTech had already compiled along with data from a previous study (Fountain Hills Conference Resort & Spa for Fountain Hills by the CK Group, Inc) has been added to the parking study. It should be noted that the resorts with reported parking problems generally have a low parking ratio of parking per KSF of meeting space. Per the parking study prepared for the Fountain Hills Conference Resort & Spa , parking recommended for meeting/ballroom space is 25 spaces/KSF. Per ULI Shared Parking, 2nd Edition, 30 spaces/KSF is recommended, which is provided in Phase 3 of CopperWynd (35.2 spaces per KSF). The two resorts with reported parking problems have low parking per KSF of meeting space, 14.1 and 5.7. Moreover, CopperWynd will have a minimal amount amount of meeting/ballroom space (9,850 SF) compared to other resorts in the comparison table.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
7.	Please provide supporting references for the reduction in parking needs by utilizing ride-share services (Uber, Lyft; taxis, shuttles), since this is part of the request for the reductions (see paragraph 2, page 6).	The drive-in rate assumed in the analysis was 60%, meaning that 60% of hotel guests were assumed arrive by personal/rented car, and the other 40% would be taxi, hotel shuttle or ride share companies. ***Due to the Town's concern, it's been increased to 66% in the parking model, which coorelates to recommendations in the*** **Urban Land Institute, 2nd Edition.** It was initially lower due to the Hotel providing an airport and local shuttle. The parking model currently utilizes 1.8 guests per room (data obtained from hotel), 66% drive-in (assumed), and a 1.9 persons per vehicle carpool rate (guests between rooms sharing rental car). This results in 0.625 spaces per room for guest parking. Our existing count revealed that on Thursday Feb 2, 2017, 18 spaces were occupied at 6:00 AM in Lot A (hotel guests) and the peak of day was also 18 in Lot A. Per the hotel, 29 rooms were occupied on Feb 1 and Feb 2. This results in a rate of 0.62 spaces per room for guest parking only, which correlates to the assumptions for guest parking. Other hotel uses and employees are considered separately. Therefore, the assumptions are reasonable.
8.	Table 8 has reference "3" for "% using personal vehicles", but no note is provided.	Footnotes have been added.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
9.	While the restaurant and spa are existing, it should be safe to assume the patronage of these amenties would increase and not maintain current rates. Thus, parking spaces for these uses neeed to be accounted for in the calculations. (see page 5, paragraph 1)	The existing member and restaurant parking counts are included in a column in the shared parking model and are listed per hour as collected in the field. Per the hotel, improvements are being made for the future hotel guests. They do not expect to increase patronage from off-site to the restaurant and spa. The member number is also not planned to increase. The existing peak demand of the restaurant/members was estimated to be 57 parking spaces at 7:00 PM on Saturday. This was assumed by adding Lot A & Lot B together and subtracting the assumed hotel spaces derived from the 6:00 AM count. The assumed hotel guest parking was 14 on Thursday and 18 on Saturday, resulting in 36 leftover for restaurant/members on weekday and 57 on weekend. Lot C is employee parking.
10.	Page 2, paragraph 4 it states twice that parking in the "middle lot" is used for restaurant patrons. Please fix the redundancy.	Fixed.
11.	Please provide parking for each phase not for Phase 1 and Build-out only, i.e., please show how Phase II parking will be addressed.	Phase 2 was initially provided in a separate addendum, since the provided parking was finalized at a later date. The new submittal includes all three phases in one document. Previously, full-build out represented Phase 3.
12.	Please show the conference center at 9,850 SF or change references in the parking study - 1,000 SF difference is about 11% increase which is a considerable amount.	Not sure where in the parking study this note refers to. After our review, all our references and calculations use 9,850 SF.
13.	The presentation of the phasing in the renderings is confusing. Please provided clearer images.	We've included the most recent renderings from the architect within the Appendix of the Parking Study.
	Notes from Parking Study Mark-up:	
14.	Cover page: Change Road to Drive	Correction made.
15.	100% valet service is not practiced.	Refer to response for **Item 4** above.

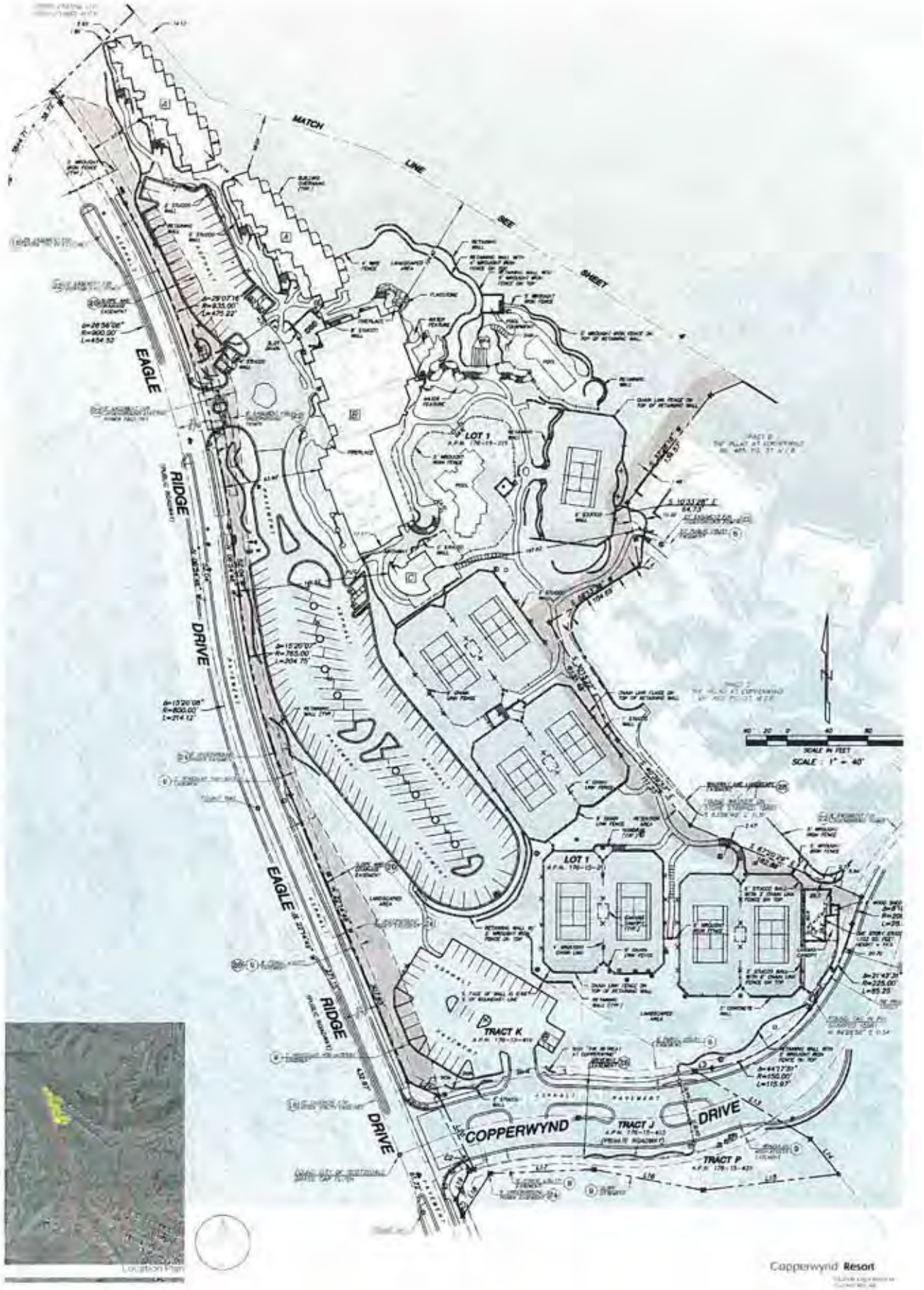
Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
16.	Expand tables in report to show Phases 2 & 3 also.	Phase 2 was initially provided in a separate addendum, since the provided parking was finalized at a later date. The new submittal includes all three phases in one document. Previously, full-build out represented Phase 3.
17.	% Using Personal Vehicles: There is no public transporation located nearby. These seem high.	Refer to response for **Item 7** above.

APPENDIX B

SITE PLAN



Location Plan

Copperwynd Resort

COPPERWYND
RESORT & CLUB

Existing Conditions

Concept Planning Package | **Full Phase Plans**

Allen Gibbs Houlik

Parking Yield: 211 spaces on Grade
+40 valet spaces
special event parking

Total Parking Provided: 251 spaces

Copperwynd **Resort**

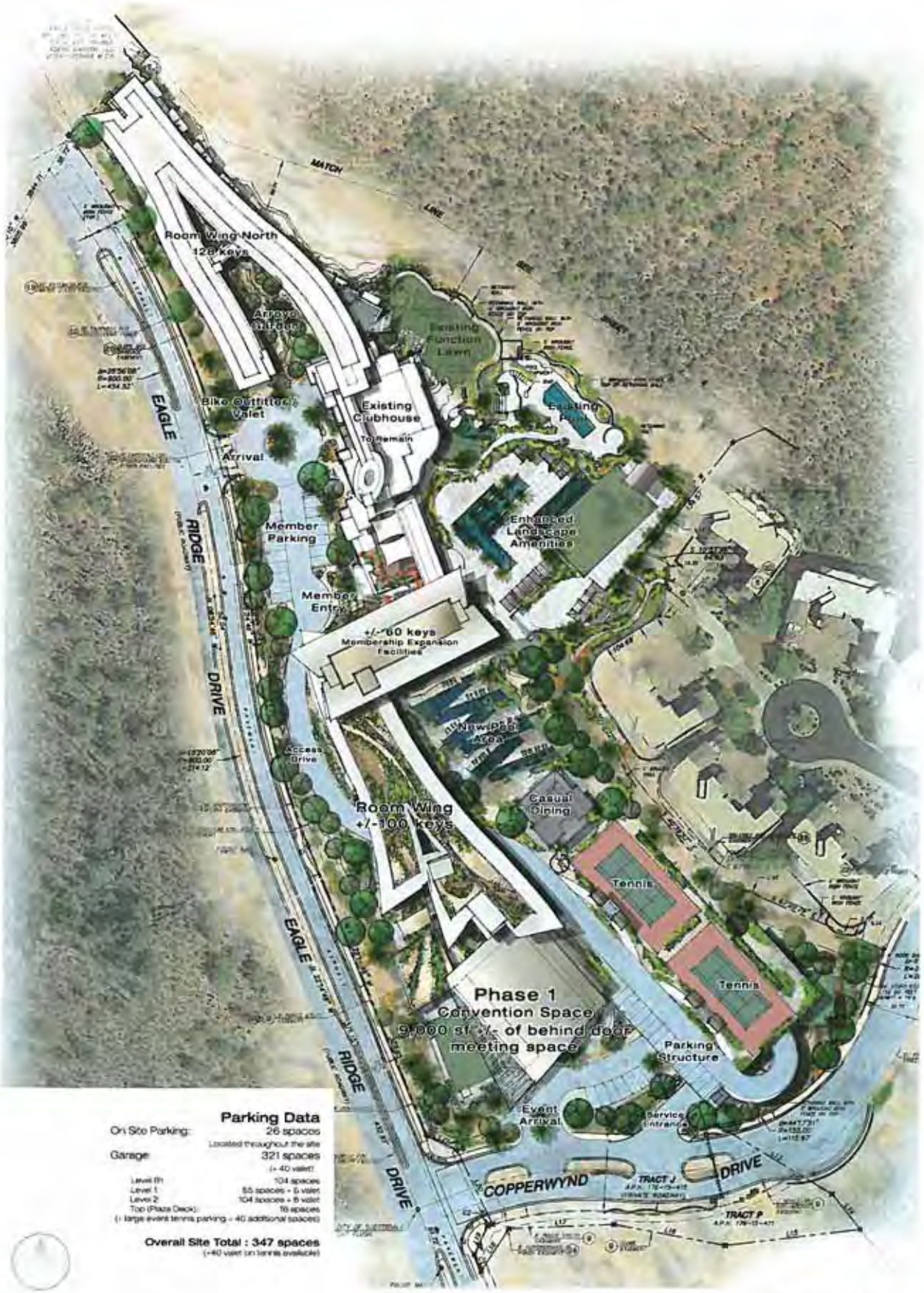
COPPERWYND
RESORT & CLUB

Phase Two Site Plan

Conceptual Planning Package

0 20 40 80 160

Allen Philips Partners



Copperwynd Resort

COPPERWYND
RESORT & CLUB

Overall Site Plan | Phases 1, 2 & 3

Conceptual Planning Package

Allen Planners

APPENDIX C

EXISTING PARKING COUNTS

Parking Lot Counts

Project # 17-210
CopperWynd Resort
February 2, 2017

	A			B			C			
	Normal	ADA	Total	Normal	ADA	Total	Normal	ADA	Total	
Time	30	4	34	123	2	125	33	1	34	GRAND TOTAL
6:00 AM	17	1	18	8		8	1		1	27
6:30 AM	16	1	17	13		13	1		1	31
7:00 AM	14	2	16	20		20	2		2	38
7:30 AM	14	1	15	15		15	3		3	33
8:00 AM	14	1	15	33		33	10		10	58
8:30 AM	11	3	14	41		41	12		12	67
9:00 AM	10	3	13	44		44	15		15	72
9:30 AM	12	3	15	38	1	39	20		20	74
10:00 AM	6	3	9	35	1	36	23		23	68
10:30 AM	7	2	9	31	2	33	24		24	66
11:00 AM	9	2	11	35		35	26		26	72
11:30 AM	7	2	9	37		37	26		26	72
12:00 PM	9	2	11	35		35	26		26	72
12:30 PM	8	1	9	29		29	26		26	64
1:00 PM	10	1	11	24		24	23		23	58
1:30 PM	13	1	14	25	2	27	26		26	67
2:00 PM	17	1	18	29	2	31	27		27	76
2:30 PM	13	2	15	28	2	30	29		29	74
3:00 PM	12	2	14	24	1	25	28		28	67
3:30 PM	10		10	23	1	24	21		21	55
4:00 PM	10		10	27		27	24		24	61
4:30 PM	10		10	31		31	23		23	64
5:00 PM	9		9	24	1	25	21		21	55
5:30 PM	9		9	30		30	21		21	60
6:00 PM	9	1	10	34		34	16		16	60
6:30 PM	13	1	14	38		38	10		10	62
7:00 PM	14	1	15	36		36	10		10	61
7:30 PM	14	1	15	28		28	9		9	52
8:00 PM	17	1	18	17		17	8		8	43
8:30 PM	17		17	15		15	7		7	39
9:00 PM	14		14	14		14	6		6	34

Parking Lot Counts

Project # 17-210
CopperWynd Resort
February 4, 2017

	A			B			C			
	Normal	ADA	Total	Normal	ADA	Total	Normal	ADA	Total	
Time	30	4	34	123	2	125	33	1	34	GRAND TOTAL
6:00 AM	14		14	2		2	1		1	17
6:30 AM	14		14	3		3	1		1	18
7:00 AM	13	1	14	8		8	4		4	26
7:30 AM	13	1	14	12		12	6		6	32
8:00 AM	10		10	17		17	6		6	33
8:30 AM	9		9	41		41	7		7	57
9:00 AM	8		8	48	1	49	11		11	68
9:30 AM	10		10	50	1	51	12		12	73
10:00 AM	10		10	50	2	52	13		13	75
10:30 AM	11		11	44	1	45	16		16	72
11:00 AM	8		8	40		40	18		18	66
11:30 AM	6		6	35	1	36	16		16	58
12:00 PM	11		11	19	1	20	17		17	48
12:30 PM	8	1	9	24	1	25	17		17	51
1:00 PM	8	1	9	23	2	25	18		18	52
1:30 PM	8	2	10	30	2	32	19		19	61
2:00 PM	9	2	11	26	2	28	21		21	60
2:30 PM	10		10	28	1	29	22		22	61
3:00 PM	6		6	28		28	23		23	57
3:30 PM	6		6	17		17	21		21	44
4:00 PM	7		7	26		26	16		16	49
4:30 PM	9		9	21		21	18		18	48
5:00 PM	10		10	19		19	18		18	47
5:30 PM	9		9	19		19	17		17	45
6:00 PM	17	4	21	42		42	15		15	78
6:30 PM	21	4	25	35	1	36	11		11	72
7:00 PM	24	4	28	42	1	43	11		11	82
7:30 PM	25	4	29	36	1	37	12		12	78
8:00 PM	23	4	27	29	1	30	12		12	69
8:30 PM	22	4	26	32	1	33	8		8	67
9:00 PM	20	4	24	30	1	31	6		6	61

APPENDIX D

TOWN OF FOUNTAIN HILLS ZONING ORDINANCE

CHAPTER 7

CivTech

Chapter 7

PARKING AND LOADING REQUIREMENTS

Sections:

11. One parking space for persons with disabilities shall be required for any development having 25 or more parking spaces. Thereafter, not less than two percent (2%) of the parking spaces within a development shall be built and maintained as parking spaces for persons with disabilities.

C. **The Use of Tandem Parking Spaces:** To meet the off-street parking requirements of this Chapter is not permitted in any zoning district.

Section 7.04 Schedule of Required Off-Street Spaces

A. **Off-Street Parking Spaces:** Shall be provided for each specified use in accordance with the schedule below.

B. **Definitions:** In calculating the total number of required parking spaces, "usable area" as used herein shall mean the area capable of being devoted to the specified use (does not include such spaces as kitchens, rostrums, hallways, etc), and the term "seat" shall also include each thirty (30) inches of bench seating when individual seats are not provided.

C. **Mixed Use Developments:** In the event of mixed-use developments, the total requirement for off-street parking spaces is the sum of the requirements of the various uses computed separately.

D. **Fractional Amount:** In calculating the total number of required off-street parking spaces, fractional amounts shall be rounded upward to the next whole parking space.

E. **Unlisted Uses:** Minimum parking requirements for a specific use not listed in this Section shall be determined by the Community Development Director with appeal to the Planning and Zoning Commission.

F. **Parking in Areas Zoned "Commercial Common":** Uses located on lots less than 20,000 square feet in areas with a zoning designation of "Commercial Common" are not required to meet the minimum parking schedule herein listed. The off-street parking provided in the common parking areas shall be deemed sufficient to meet the off-street parking demands for the uses on the lots under 20,000 square feet. Uses on lots 20,000 square feet or more in size, that are located in an area zoned "Commercial Common", shall meet at least the minimum off-street parking demand on the lot where the use is located, in accordance with the schedule herein provided in this ordinance.

G. Schedule.

1. Residential Use:

a. One-or two-family residence: .....2 per dwelling unit

b. Multiple dwellings:
Efficiency units..... 1½ per dwelling unit
One-bedroom units..... 1½ per dwelling unit
Two or more bedroom units..... 2 per dwelling unit

Multiple dwellings shall also provide guest parking at a rate of .25 parking spaces per dwelling unit.

c.	Rooming houses, fraternities, bed, sororities, resident clubs, lodges	1 per sleeping room or 1 per whichever is greater
d.	Mobile home parks and per subdivision	2 per mobile home site, plus 1 2 employees; 1 per 400 square feet of recreation hall or club house area
e.	Model Homes	1 for each person stationed on site, plus two spaces
f.	Truck Rental Spaces	1 per truck with a minimum of 4 spaces

2. Commercial sales and service:

a.	Restaurants, bars, cocktail lounges	1 per 50 sq. feet of useable floor area
b.	Drive-in food or drink places with on-site consumption	1 per 50 sq. feet of useable floor area, plus 1 per 2-employees
c.	Mortuaries, funeral homes	1 space for each 75 sq. feet of G.F.A. of public assembly area

d.	Self-service laundries and dry cleaners	1 per 2 machines
e.	Open air businesses	1 per 500 sq. ft. of sales area for the first 2,000 plus 1 per additional 2,000 sq ft
f.	Auto sales lots	1 per each 300 sq. feet of office area and covered parking area, 2 for the first 10,000 sq. feet or portion thereof, and 1 for each additional 10,000 ft. or portion thereof; plus 1 per employee
g.	Gas service stations	1 per each 375 sq. feet of building
h.	Car wash:	1 per employee, plus reserve spaces equal to 5 times the wash capacity
i.	Motor vehicle and machinery area.	1 per 200 sq. feet of floor
j.	Planned shopping centers under unified control	Requirements for all uses elsewhere specified herein, plus 1 per 250 sq ft of gross leasable space
k.	Barbershops, beauty shops	2 per service chair
l.	Furniture and appliance stores, household equipment	1 per 800 sq. feet floor area
m.	Supermarkets, drugstores	1 per 250 sq. feet of gross leasable space
n.	Hotels, motels	1 per guest room or suite, plus 1 per 2 employees

o.	Bus depots	1 per 150 sq. feet of waiting room space
p.	Skating rinks, dance halls, dance studios	1 per 3 persons of maximum capacity permitted by fire regulations
q.	Bowling alleys	4 per bowling lane, plus 1 per seat in gallery, plus 1 per 2 employees
r.	Billiard parlors	1 per 2 billiard tables, plus 1 per 2 employees
s.	Gymnasiums, health studios	1 per 400 sq. feet. of usable floor area, plus 1 per 2 employees
t.	Private golf clubs, swimming, and tennis clubs	1 per every 5 member families or individuals
u.	Theaters, auditoriums, gymnasiums and similar places of public assembly	1 per 4-person occupancy capacity

3. Offices and Clinic Uses:

a.	Offices, banks, savings and gross or loan agencies	1 per 250 sq. feet of floor area
b.	Medical and dental offices and clinics	1 per 100 sq. feet of waiting examination room or dental chair plus 1 per 2 employees
c.	Nursing homes, convalescent homes, and homes for the aged	1 per 4 beds

4. Schools and Institutions:

a.	Elementary and intermediate schools	1 per employee

b.	High schools	1 per 8 students, plus 1 per employee
c.	Junior colleges, colleges, students universities	1 per 3 enrolled full-time day plus 1 per 2 employees
d.	Trade schools, business college	1 per 150 sq. feet of gross floor area
e.	Hospitals	1 per 2 beds, plus 1 per employee
f.	Churches, community of centers, assembly halls, clubs, and libraries	1 space per each 75 sq. feet G.F.A. for the public

5. Manufacturing and industrial uses:

a.	Manufacturing	2 per every 3 employees
b.	Telemarketing, Data Processing Centers	1 per 50 square feet
c.	Other industrial uses	1 per 300 square feet
d.	Warehousing or wholesaling	1 per 800 square feet
e.	Mini-Storage	1 per 35 spaces; plus 1 for the manager
f.	Truck Rental Spaces	1 per truck with a minimum of 4 spaces

H. Off-Street Loading and Unloading Spaces:

1. Unless otherwise specified in this Ordinance, off-street loading and unloading spaces shall have a minimum width of twelve (12) feet, a minimum length of forty-five (45) feet and a minimum height of fourteen (14) feet, exclusive of access aisles and maneuvering space.

2. Off-street loading and unloading spaces with a minimum width of ten (10) feet and a minimum length of thirty (30) feet may be provided for all or part of the required number of off-street loading and unloading spaces if approved by the Planning & Zoning Commission through the conceptual site plan approval process.

3. Off-street loading and unloading spaces shall not be permitted in any required front yard, or in any required side yard, except in nonresidential districts. Off-street loading and unloading spaces may occupy all or any part of a required rear yard, except as otherwise provided herein, and may be partially or entirely enclosed within a building. All off-street loading and unloading loading spaces abutting residential zoning districts shall be screened from the residential zoning districts by a masonry wall not less than eight (8) feet in height.

4. Where a building or use in a nonresidential district abuts an alley, such alley may be used as maneuvering space for off-street loading and unloading spaces. No alley abutting any residential district may be so used.

5. Off-street loading and unloading spaces, aisles, and access drives shall be paved so as to provide a durable dust-proof surface and shall be so graded and drained so as to dispose of surface water without damage to private or public properties, street, or alleys.

5. Schedule of off-street loading and unloading space requirements: Unless otherwise provided in the Ordinance, every office, hotel, restaurant, department store, hospital, industrial plant, manufacturing establishment, retail establishment, storage warehouse or wholesale establishments, and all other structures devoted to similar mercantile or industrial pursuits, which has a aggregate gross floor area of five thousand (5,000) square feet or more shall provide off-street loading and unloading spaces in accordance with the following table:

APPENDIX E

SHARED PARKING MODEL

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: March 5, 2017
Scenario: Phase 1 (128 rooms north side and conference space)

SHARED PARKING MODEL-WEEKDAY

Land Use	Guest Rooms[1]		Employees[2]		Meeting/Banquet Rooms[3]		Existing Restaurant & Members[4]		Total Req'd Parking
Size	128 Keys		42 Emp		9,850 SF				
Parking Demand	80.03		21.12		98.50		44.00		243.65
Beginning Hour	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Total Shared Parking Demand
6:00 AM	100%	80	5%	1	0%	0		8	89
7:00 AM	96%	77	30%	6	0%	0		20	103
8:00 AM	90%	72	90%	19	30%	30		33	154
9:00 AM	87%	70	90%	19	60%	59		44	192
10:00 AM	82%	66	100%	21	60%	59		36	182
11:00 AM	77%	62	100%	21	60%	59		35	177
12:00 PM	77%	62	100%	21	65%	64		35	182
1:00 PM	75%	60	100%	21	65%	64		24	169
2:00 PM	73%	58	100%	21	65%	64		31	174
3:00 PM	70%	56	100%	21	65%	64		25	166
4:00 PM	71%	57	90%	19	65%	64		27	167
5:00 PM	70%	56	70%	15	100%	99		25	195
6:00 PM	74%	59	40%	8	100%	99		34	200
7:00 PM	75%	60	20%	4	100%	99		36	199
8:00 PM	79%	63	20%	4	100%	99		17	183
9:00 PM	85%	68	20%	4	100%	99		14	185
10:00 PM	87%	70	20%	4	50%	49			123
11:00 PM	97%	78	10%	2	0%	0			80
12:00 AM	100%	80	5%	1	0%	0			81
									200

1. Hourly percentages are from *ITE Parking Generation, 4th Edition* for ITE Code 310 (Hotel)
2. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Employees were utilized
3. Hourly percentages from *Urban Land Institute's Shared Parking, 2nd Edition* for Hotel Conference/Banquet were utilized
4. Obtained from Existing Parking Counts

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: March 5, 2017
Scenario: Phase 1 (128 rooms north side and conference space)

SHARED PARKING MODEL-WEEKEND

Land Use	Guest Rooms[1]		Employees[2]		Meeting/Banquet Rooms[3]		Existing Restaurant & Members[4]		Total Req'd Parking
Size	128 Keys		42 Emp		9,850 SF				
Parking Demand	80.03		21.12		98.50		57.00		256.65
Beginning Hour	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Total Shared Parking Demand
6:00 AM	100%	80	5%	1	0%	0		2	83
7:00 AM	96%	77	30%	6	0%	0		8	91
8:00 AM	90%	72	90%	19	30%	30		17	138
9:00 AM	87%	70	90%	19	60%	59		49	197
10:00 AM	82%	66	100%	21	60%	59		52	198
11:00 AM	77%	62	100%	21	60%	59		40	182
12:00 PM	77%	62	100%	21	65%	64		20	167
1:00 PM	75%	60	100%	21	65%	64		25	170
2:00 PM	73%	58	100%	21	65%	64		28	171
3:00 PM	70%	56	100%	21	65%	64		28	169
4:00 PM	71%	57	90%	19	65%	64		26	166
5:00 PM	70%	56	75%	16	100%	99		19	190
6:00 PM	74%	59	60%	13	100%	99		49	220
7:00 PM	75%	60	55%	12	100%	99		57	228
8:00 PM	79%	63	55%	12	100%	99		43	217
9:00 PM	85%	68	55%	12	100%	99		41	220
10:00 PM	87%	70	45%	10	50%	49			129
11:00 PM	97%	78	45%	10	0%	0			88
12:00 AM	100%	80	30%	6	0%	0			86
									228

1. Hourly percentages are from *ITE Parking Generation, 4th Edition* for ITE Code 310 (Hotel).
2. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Employees were utilized.
3. Hourly percentages from *Urban Land Institute's Shared Parking, 2nd Edition* for Hotel Conference/Banquet were utilized.
4. Obtained from Existing Parking Counts

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: March 5, 2017
Scenario: Phase 2

SHARED PARKING MODEL-WEEKDAY

Land Use	Guest Rooms[1]		Employees[2]		Meeting Rooms[3]		Existing Restaurant & Members[4]		Total Req'd Parking
Size	188 Keys		62 Emp		9,850 SF				
Parking Demand	117.55		31.02		98.50		44.00		291.07
Beginning Hour	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Total Shared Parking Demand
6:00 AM	100%	118	5%	2	0%	0		8	128
7:00 AM	96%	113	30%	9	0%	0		20	142
8:00 AM	90%	106	90%	28	30%	30		33	197
9:00 AM	87%	102	90%	28	60%	59		44	233
10:00 AM	82%	96	100%	31	60%	59		36	222
11:00 AM	77%	91	100%	31	60%	59		35	216
12:00 PM	77%	91	100%	31	65%	64		35	221
1:00 PM	75%	88	100%	31	65%	64		24	207
2:00 PM	73%	86	100%	31	65%	64		31	212
3:00 PM	70%	82	100%	31	65%	64		25	202
4:00 PM	71%	83	90%	28	65%	64		27	202
5:00 PM	70%	82	70%	22	100%	99		25	228
6:00 PM	74%	87	40%	12	100%	99		34	232
7:00 PM	75%	88	20%	6	100%	99		36	229
8:00 PM	79%	93	20%	6	100%	99		17	215
9:00 PM	85%	100	20%	6	100%	99		14	219
10:00 PM	87%	102	20%	6	50%	49			157
11:00 PM	97%	114	10%	3	0%	0			117
12:00 AM	100%	118	5%	2	0%	0			120
									233

1. Hourly percentages are from *ITE Parking Generation, 4th Edition* for ITE Code 310 (Hotel).
2. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Employees were utilized.
3. Hourly percentages from *Urban Land Institute's Shared Parking, 2nd Edition* for Hotel Conference/Banquet were utilized.
4. Obtained from Existing Parking Counts

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: March 5, 2017
Scenario: Phase 2

SHARED PARKING MODEL-WEEKEND

Land Use	Guest Rooms[1]		Employees[2]		Meeting Rooms[3]		Existing Restaurant & Members[4]		Total Req'd Parking
Size	188 Keys		62 Emp		9,850 SF				
Parking Demand	117.55		31.02		98.50		57.00		304.07
Beginning Hour	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Total Shared Parking Demand
6:00 AM	100%	118	5%	2	0%	0		2	122
7:00 AM	96%	113	30%	9	0%	0		8	130
8:00 AM	90%	106	90%	28	30%	30		17	181
9:00 AM	87%	102	90%	28	60%	59		49	238
10:00 AM	82%	96	100%	31	60%	59		52	238
11:00 AM	77%	91	100%	31	60%	59		40	221
12:00 PM	77%	91	100%	31	65%	64		20	206
1:00 PM	75%	88	100%	31	65%	64		25	208
2:00 PM	73%	86	100%	31	65%	64		28	209
3:00 PM	70%	82	100%	31	65%	64		28	205
4:00 PM	71%	83	90%	28	65%	64		26	201
5:00 PM	70%	82	75%	23	100%	99		19	223
6:00 PM	74%	87	60%	19	100%	99		49	254
7:00 PM	75%	88	55%	17	100%	99		57	261
8:00 PM	79%	93	55%	17	100%	99		43	252
9:00 PM	85%	100	55%	17	100%	99		41	257
10:00 PM	87%	102	45%	14	50%	49			165
11:00 PM	97%	114	45%	14	0%	0			128
12:00 AM	100%	118	30%	9	0%	0			127
									261

1. Hourly percentages are from *ITE Parking Generation, 4th Edition* for ITE Code 310 (Hotel).
2. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Employees were utilized.
3. Hourly percentages from *Urban Land Institute's Shared Parking, 2nd Edition* for Hotel Conference/Banquet were utilized.
4. Obtained from Existing Parking Counts

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: March 5, 2017
Scenario: Full Build

SHARED PARKING MODEL-WEEKDAY

Land Use	Guest Rooms[1]		Employees[2]		Meeting/Banquet Rooms[3]		Existing Restaurant & Members[4]		Total Req'd Parking
Size	300 Keys		99 Emp		9,850 SF				
Parking Demand	187.58		49.50		98.50		44.00		379.58
Beginning Hour	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Total Shared Parking Demand
6:00 AM	100%	188	5%	2	0%	0		8	198
7:00 AM	96%	180	30%	15	0%	0		20	215
8:00 AM	90%	169	90%	45	30%	30		33	277
9:00 AM	87%	163	90%	45	60%	59		44	311
10:00 AM	82%	154	100%	50	60%	59		36	299
11:00 AM	77%	144	100%	50	60%	59		35	288
12:00 PM	77%	144	100%	50	65%	64		35	293
1:00 PM	75%	141	100%	50	65%	64		24	279
2:00 PM	73%	137	100%	50	65%	64		31	282
3:00 PM	70%	131	100%	50	65%	64		25	270
4:00 PM	71%	133	90%	45	65%	64		27	269
5:00 PM	70%	131	70%	35	100%	99		25	290
6:00 PM	74%	139	40%	20	100%	99		34	292
7:00 PM	75%	141	20%	10	100%	99		36	286
8:00 PM	79%	148	20%	10	100%	99		17	274
9:00 PM	85%	159	20%	10	100%	99		14	282
10:00 PM	87%	163	20%	10	50%	49			222
11:00 PM	97%	182	10%	5	0%	0			187
12:00 AM	100%	188	5%	2	0%	0			190
									311

1. Hourly percentages are from ITE Parking Generation, 4th Edition for ITE Code 310 (Hotel).
2. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Employees were utilized.
3. Hourly percentages from *Urban Land Institute's Shared Parking, 2nd Edition* for Hotel Conference/Banquet were utilized.
4. Obtained from Existing Parking Counts

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: March 5, 2017
Scenario: Full Build

SHARED PARKING MODEL-WEEKEND

Land Use	Guest Rooms[1]		Employees[2]		Meeting/Banquet Rooms[3]		Existing Restaurant & Members[4]		Total Req'd Parking
Size	300 Keys		99 Emp		9,850 SF				
Parking Demand	187.58		49.50		98.50		57.00		392.58
Beginning Hour	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Percent of Peak Demand	No. of Parking Spaces	Total Shared Parking Demand
6:00 AM	100%	188	5%	2	0%	0		2	192
7:00 AM	96%	180	30%	15	0%	0		8	203
8:00 AM	90%	169	90%	45	30%	30		17	261
9:00 AM	87%	163	90%	45	60%	59		49	316
10:00 AM	82%	154	100%	50	60%	59		52	315
11:00 AM	77%	144	100%	50	60%	59		40	293
12:00 PM	77%	144	100%	50	65%	64		20	278
1:00 PM	75%	141	100%	50	65%	64		25	280
2:00 PM	73%	137	100%	50	65%	64		28	279
3:00 PM	70%	131	100%	50	65%	64		28	273
4:00 PM	71%	133	90%	45	65%	64		26	268
5:00 PM	70%	131	75%	37	100%	99		19	286
6:00 PM	74%	139	60%	30	100%	99		49	317
7:00 PM	75%	141	55%	27	100%	99		57	324
8:00 PM	79%	148	55%	27	100%	99		43	317
9:00 PM	85%	159	55%	27	100%	99		41	326
10:00 PM	87%	163	45%	22	50%	49			234
11:00 PM	97%	182	45%	22	0%	0			204
12:00 AM	100%	188	30%	15	0%	0			203
									326

1. Hourly percentages are from ITE Parking Generation, 4th Edition for ITE Code 310 (Hotel).
2. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Employees were utilized.
3. Hourly percentages from Urban Land Institute's Shared Parking, 2nd Edition for Hotel Conference/Banquet were utilized.
4. Obtained from Existing Parking Counts

APPENDIX F

COMPARISON TABLE TO SIMILAR RESORTS

Comparison of Parking Provided of Similar Resorts

Resort	Guest Units	Meeting Space (KSF)	Meeting Space per Room (SF/Room)	Rooms per KSF of Meeting Space	Parking Provided	Parking per KSF of Meeting Space	Spaces per Key
Scottsdale Plaza	404	40	99.0	10.1	403	10.1	1.00
Scottsdale Mondrian-Scottsdale[1]	200	5	25.0	40.0	200	40.0	1.00
Carefree Resort & Villas-Carefree	465	34	73.1	13.7	240	7.1	0.52
Doubletree Paradise Valley-Scottsdale[2]	378	30	79.4	12.6	559	18.6	1.48
Hilton Scottsdale Resort & Spa-Scottsdale[2][3]	187	23	123.0	8.1	325	14.1	1.74
Hyatt Regency Resort & Spa - Scottsdale	490	35	71.4	14.0	900	25.7	1.84
Westward Look Resort - Tucson[2]	244	20	82.0	12.2	470	23.5	1.93
JW Mariott Starr Pass Resort & Spa - Tucson[2][3]	575	88	153.0	6.5	500	5.7	0.87
Average	**367.9**	**34.4**	**88.2**	**14.7**	**449.6**	**18.1**	**1.30**
CopperWynd Phase 1	128	9.85	77.0	13.0	199	20.2	1.55
CopperWynd Phase 2	188	9.85	52.4	19.1	251	25.5	1.34
CopperWynd Phase 3	300	9.85	32.8	30.5	347	35.2	1.16

1. Existing counts revealed a demand of 0.49 spaces per room.

2. Overflow Parking is available.

3. Parking Problem has been reported, however meeting/ballroom space is greater than 20 KSF and is large compared to number of rooms. The parking per KSF of meeting space is signficantly less than the 30 spaces per KSF of meeting space recommended per ULI Shared Parking, 2nd Edition.

APPENDIX G

ITE PARKING GENERATION

Project: CopperWynd Resort (17-0210)
Location: 13225 N. Eagle Ridge Drive - Fountain Hills, Arizona
Date: 3/5/2017

ITE Parking Generation, 4th Edition

LAND USE: 310
Hotel

Average Peak Period Parking Demand vs. Occupied Rooms
On a: Weekday
Location: Suburban

Statistic	Peak Period Demand
Peak Period	12:00-1:00 PM; 7:00-10:00 PM; 11:00 - 5:00 AM
Number of Study Sites	20
Average Size of Study Sites	315 Occupied Rooms
Average Peak Period Parking Demand	0.89 vehicles per occupied room
Standard Deviation	0.31
Coefficient of Variation	35%
95% Confidence Interval	0.75-1.02 vehicles per occupied room
Range	0.61-1.94 vehicles per occupied room
85th Percentile	1.08 vehicles per occupied room
33rd Percentile	0.72 vehicles per occupied room

Average parking supply ratio: 1.3 spaces per room for suburban sites (12 study sites) and 1.0 space per room for urban sites (two study sites)

Hotel (cont'd)

Size (occupied rooms): 128
Average Peak Period Parking Demand: 114.00
85th Percentile Parking Demand: 139.00

Size (occupied rooms): 188
Average Peak Period Parking Demand: 168.00
85th Percentile Parking Demand: 204.00

Size (occupied rooms): 300
Average Peak Period Parking Demand: 267.00
85th Percentile Parking Demand: 324.00

EXHIBIT D
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Traffic Study]

See following pages.

CopperWynd Resort and Club Renovation

Traffic Impact Analysis

13225 N. Eagle Ridge Drive
Fountain Hills, Arizona

March 2017
Project No. 17-0212

Prepared For:

Palisades Resorts, LLC
13225 N. Eagle Ridge Dr.
Fountain Hills, AZ 85288

For Submittal to:

Town of Fountain Hills

Prepared By:

CivTech

10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
480-659-4250

COPPERWYND RESORT & CLUB EXPANSION
TRAFFIC IMPACT ANALYSIS

13225 N. Eagle Ridge Drive
Fountain Hills, Arizona

Prepared for:
Palisades Resorts, LLC
13225 N. Eagle Ridge Dr
Fountain Hills, AZ 85288

For Submittal to:
Town of Fountain Hills

Prepared By:

CivTech

CivTech, Inc.
10605 North Hayden Roadp
Suite 140
Scottsdale, Arizona 85260
(480) 659-4250

Expires 12-31-2018

March 2017

CivTech Project No. 17-0212

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

This report documents a traffic impact and mitigation analysis performed for the proposed improvements to the CopperWynd Resort and Club located on the northwest corner of Eagle Ridge Drive and Copperwynd Drive in Fountain Hills, Arizona. The following conclusions and recommendations have been documented in this study.

Site Plan and Access

- Renovations are proposed for the CopperWynd Resort and Club in Fountain Hills, Arizona. Redevelopment is proposed in phases and will consist of a total of 300 rooms and an addition of 9,850 square feet of meeting/banquet space at full build-out. A restaurant and fitness/tennis club is currently on-site and will remain with the redevelopment. A conceptual site plan is included in **Figure 4**.

- The site plan depicts maintaining the two (2) existing driveways as public entrances. The driveway on Eagle Ridge Drive is the main entrance and is expected to facilitate most of guest enter/exit trips. The secondary driveway to Copperwynd Drive is expected to be used for event days as well as potentially staff though a small amount of guests could be expected. The site plan also depicts an auxiliary driveway on Copperwynd Drive for deliveries.

Trip Generation

- The rates provided for the *ITE Trip Generation* "Hotel" land use category are inclusive of all the uses on-site in addition to guest rooms. Therefore, separate trip generation was not conducted for the added meeting/banquet space. The peak period for the meeting/banquet space would most likely occur on a Saturday and not during the weekday peak hours.

- The club membership will remain the same with the renovations, and the restaurant patrons from off-site are not expected to increase. The existing traffic count includes the trips from the club members and restaurant. Moreover, hotel restaurants and cocktail lounges are included in the "Hotel" rate.

- The trips associated with 32 of the analyzed 300 guest rooms are already accounted for in the existing traffic counts. This analysis calculates the expected increase in trips due to the 268 additional rooms.

- The proposed plan at full build-out is expected to generate an additional 180 trips (104 enter/76 exit) during the AM peak hour and an additional 198 trips (97 enter/101 exit) during the PM peak hour.

Level of Service Analysis

- All existing intersections are evaluated to operate at LOS D or better during the peak hours.

- The study intersections are projected to operate at LOS C or better during the peak hours of all horizon years with the exception of ***Palisades Boulevard and Shea Boulevard*** and ***Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard***. These two intersections are expected to operate at LOS E or F during one or more peak hour in 2023 and/or 2028.

Palisades Boulevard and Shea Boulevard

- The intersection of ***Palisades Boulevard and Shea Boulevard*** is anticipated to operate at LOS E during the 2028 PM peak hour. This is due to the relatively high eastbound left turn movement where dual turn lanes facilitate a projected PM peak hour volume of 1,035 vehicles. Further analysis reveals that if the maximum green interval for the movement was increased to similar to the maximum green interval of the eastbound through movement, the intersection could operate at LOS C during the 2028 PM peak hour. Actual growth may be less than projected as a 2.9 percent growth rate over a decade may be less likely given the limited area remaining for development in Fountain Hills. It is still recommended to ensure that the maximum green time is increased as future traffic volumes increase to ensure adequate operation.

Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard

- The intersection of ***Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard*** is anticipated to operate at LOS E or F in the 2023 and 2028 background and total conditions. This is mostly due to the relatively large through volume on Palisades Boulevard in relation to the increasing volume entering/exiting Eagle Ridge Drive. Signalization would mitigate the proposed delay associated with an all-way stop condition. The *Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014)* indicated that a the four-hour signal warrant is expected to be satisfied with the neighboring Adero Canyon development and trailhead at 17 percent of occupancy of planned townhomes and satisfying the eight-hour signal warrant at 29 percent occupancy.

- Depending on the timing of the build out of surrounding developments and growth of background traffic volumes, a traffic signal may be warranted at full build-out of Phase 2 or Phase 3. Per the Town of Fountain Hills, a northbound left-turn lane on Palisades Boulevard shall be installed along with traffic signal conduit and pull boxes to prepare for a future traffic signal. These improvements are recommended to be constructed prior to Phase 3 of the development.

- Per the *Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014)*, "CivTech is concerned that there may not be sufficient sight distance for drivers intending to turn right on red from the side streets to see approaching vehicles on Palisades Boulevard or for drivers intending to turn left from

Palisades Boulevard to see opposing vehicles. Therefore, if and when a traffic signal is installed, we recommend prohibiting right turns on red for the east- and westbound approaches and we recommend protected-only left turn phasing for the left turns in both directions from Palisades Boulevard."

- Due to the sight distance restrictions, it is recommended to prohibit right turns on red for the eastbound and westbound approaches and provide protected-only left turn phasing for the left turns in both directions from Palisades Boulevard. A formal assessment should be conducted during the traffic signal design process.

INTRODUCTION

Renovations are proposed for the CopperWynd Resort and Club in Fountain Hills, Arizona. Redevelopment is proposed in phases and will consist of a total of 300 rooms and an addition of 9,850 square feet of meeting/banquet space at full build-out. A restaurant and fitness/tennis club is currently on-site and will remain with the redevelopment. A location map is illustrated in **Figure 1**.

CivTech Inc. has been retained by Palisades Resorts, LLC to prepare a Traffic Impact Analysis (TIA) for the proposed CopperWynd Resort expansion.

PURPOSE OF REPORT AND STUDY OBJECTIVES

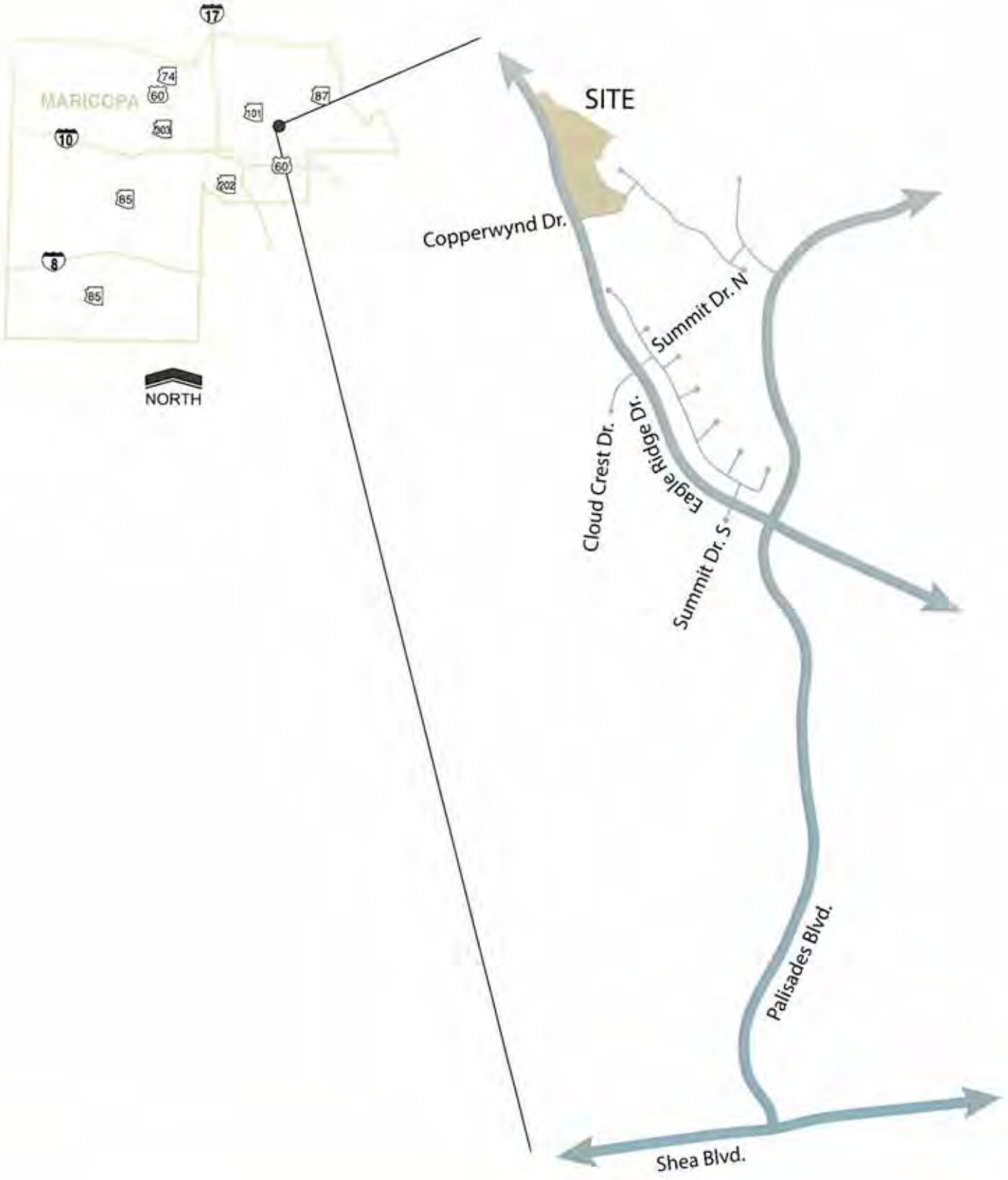
The purpose of this study is to analyze the impacts of the proposed expansion on the existing surrounding street system. The specific objectives of the study are:

- To determine whether the planned street system in the vicinity of the site is adequate to accommodate the increased traffic that results from the proposed expansion;
- To recommend additional street improvements or traffic control devices, where necessary, to mitigate the site-generated traffic; and,
- To evaluate the site access driveways.

STUDY AREA AND ANALYSIS YEARS

A preliminary trip generation indicated that the proposed expansion is anticipated to generate fewer than 500 trips during the weekday peak hour. The development is split into 3 phases. The analysis assumes 2018 as the opening year for Phase 1. Phase 2 and Phase 3 will be market driven and dependent on available funding. For analysis purposes, Phase 2 is considered in 2023 and Phase 3 in 2028. This TIA analyzes the AM peak hour and PM peak hour on a weekday at the following intersections:

- Eagle Ridge Drive & Copperwynd Drive
- Eagle Ridge Drive & Cloud Crest Trail/Summit Drive North
- Summit Drive South & Eagle Ridge Drive
- Palisades Blvd. & Eagle Ridge Drive/Palomino Blvd.
- Palisades Blvd. & Shea Blvd.



Source: CivTech 2017

Figure 1: Vicinity Map

EXISTING CONDITIONS

EXISTING AND SURROUNDING LAND USE

The CopperWynd Resort is located at 13225 N. Eagle Ridge Road situated in the McDowell Mountains in Fountain Hills, Arizona. The existing resort and club comprises 32 resort rooms, a restaurant and a spa/fitness/tennis club. The club currently has approximately 300 members. A portion of the members walk from the surrounding neighborhood. The membership will remain the same with the renovations and the restaurant patrons from off-site are not expected to increase.

The surrounding area is primarily residential. A residential condominium community, The Villas at Copperwynd, is located adjacent and northeast of the hotel, and the SunRidge Canyon Golf Club is northeast of the existing hotel. Construction is underway for the Adero Canyon development located to the northeast of the resort on Eagle Ridge Road.

ROADWAY NETWORK

The existing roadway network within the study area includes Eagle Ridge Drive, Copperwynd Drive, and Palisades Boulevard.

Eagle Ridge Drive is a collector street beginning at Palisades Boulevard to the east and currently ends west of CopperWynd Resort. Eagle Ridge Drive in the vicinity of the site is under the jurisdiction of the City of Scottsdale and is a two-lane roadway divided by a raised median. Each direction consists of 16 feet of pavement including a travel lane and bike lane. 'No parking' signs are posted, and the posted speed limit is 35 mph. Eagle Ridge Drive is being extended with the construction of the Adero Canyon development.

Copperwynd Drive is a private local street providing access from Eagle Ridge Drive to an existing employee lot for the resort, and it also provides private gated access to the existing 'The Villas at Copperwynd' condominium community. Adjacent to the site, Copperwynd Drive is owned by Palisades Resorts, LLC.

Palisades Boulevard is an arterial that loops around from Fountain Hills Boulevard to the east and heads south to Shea Boulevard. Palisades Boulevard is a four-lane roadway with two travel lanes and a bike lane in each direction divided by a raised median. The posted speed limit is 45 mph.

INTERSECTION CONFIGURATIONS AND TRAFFIC CONTROLS

The intersection of ***Eagle Ridge Drive and Copperwynd Drive*** is a T-intersection controlled by a stop sign with Copperwynd Drive stopping for Eagle Ridge Drive. The northbound approach consists a shared through/right-turn lane. The southbound approach has a dedicated left-turn lane (~110 feet of storage) and a through lane. The westbound approach consists of one shared lane.

The intersection of ***Eagle Ridge Drive and Cloud Crest Trail/Summit Drive North*** is a four-legged unsignalized intersection with stop control for the neighborhood streets. The

approaches on Eagle Ridge Drive consist of a dedicated left-turn lane (~115 feet of storage SB and ~125 feet of storage NB) and a shared through/right-turn lane. The neighborhood approaches consist of one shared lane.

The intersection of ***Eagle Ridge Drive and Summit Drive South*** is a four-legged unsignalized intersection with stop control for Summit Drive South. The south leg is a vacant cul-de-sac. The westbound approach on Eagle Ridge Drive consists of a shared through/right-turn lane, and the eastbound approach consists of a dedicated left-turn lane (~100 feet of storage) and through lane.

The intersection of ***Eagle Ridge Drive and Palisades Boulevard*** is a four-legged intersection controlled by an all-way stop. The northbound approach consists of a shared left-turn/through lane, a through lane, and a right-turn lane. The southbound approach consists of a left-turn lane, a through lane, and a shared through/right-turn lane. The eastbound and westbound approaches consist of a left-turn lane and a shared through/right-turn lane.

The intersection of ***Palisades Boulevard and Shea Boulevard*** is a four-legged signalized intersection. The northbound approach consists of a left-turn lane and a shared through/right-turn lane. The southbound approach consists of a left-turn lane, a through lane, and dual right-turn lanes (right-turn on arrow only). The eastbound approach consists of dual left-turn lanes, three through lanes, and a dedicated right-turn lane. The westbound approach consists of a left-turn lane, three through lanes, and a dedicated right-turn lane.

The existing lane configuration and traffic control is illustrated in **Figure 2**, and the existing stop control at each of the study intersections is summarized in **Table 1**.

Table 1: Existing Intersection Traffic Control

Study ID	Intersection	Traffic Control
1	Eagle Ridge Drive & Copperwynd Drive	One-way Stop (WB)
2	Eagle Ridge Drive & Cloud Crest Trail/Summit Drive North	Two-way Stop (EB/WB)
3	Summit Drive South & Eagle Ridge Drive	Two-way Stop (NB/SB)
4	Palisades Blvd. & Eagle Ridge Drive/Palomino Blvd.	All-way Stop
5	Palisades Blvd. & Shea Blvd.	Traffic Signal

TRAFFIC VOLUMES

CivTech engaged Field Data Services of Arizona, Inc. to record traffic volumes at the study intersections within the project vicinity. Peak hour volume turning movement counts were performed from 7:00-10:00 AM and 4:00-6:00 PM on Thursday, February 2, 2016. The peak 60 minute traffic volumes during the observed times is considered typical peak hour traffic volumes for purposes of this study. The existing turning movement volumes are depicted in **Figure 3** for the weekday morning and evening peak hours. The traffic volume data obtained for this study have been included in **Appendix B**.

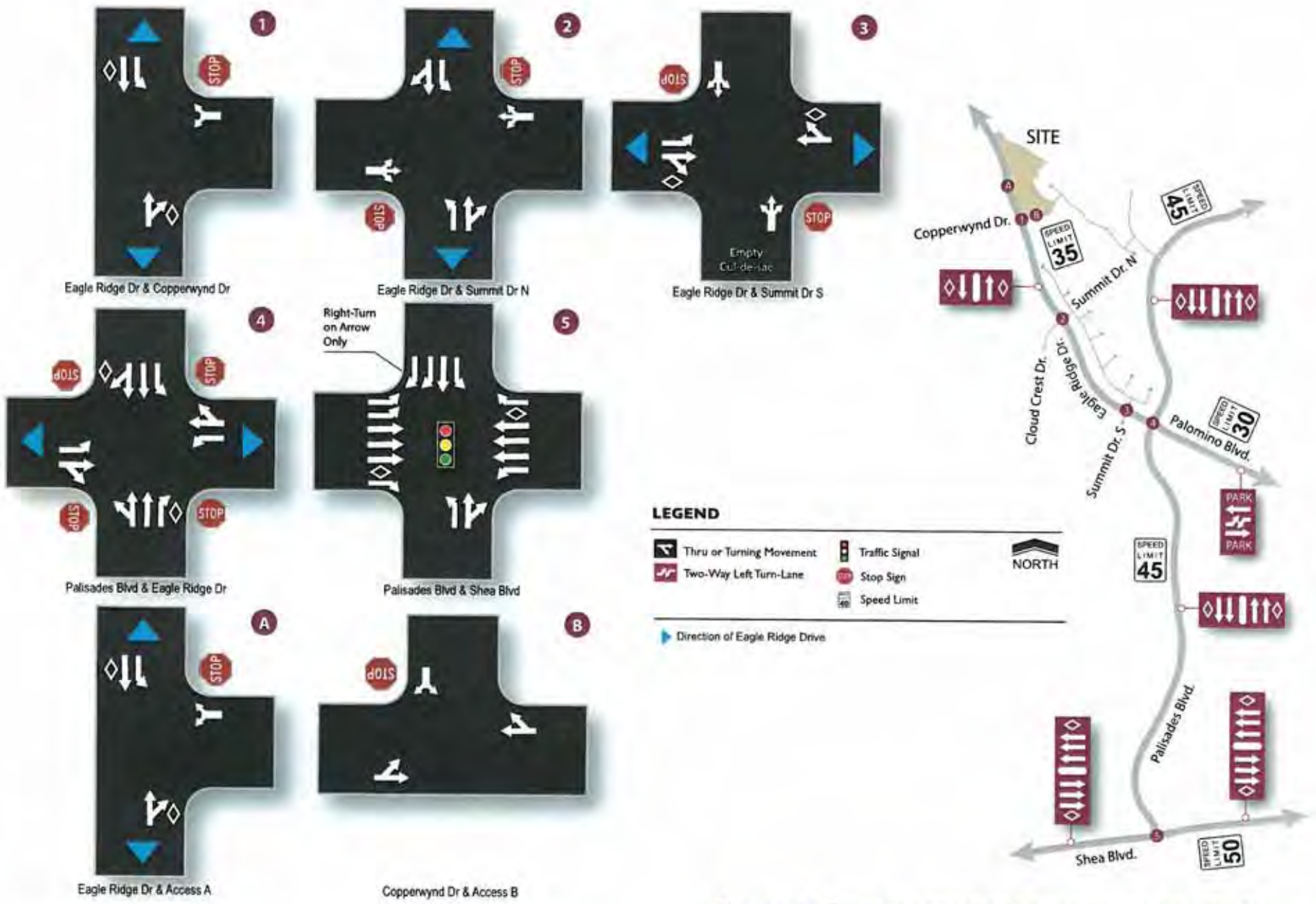


Figure 2: Existing Lane Configurations and Traffic Controls

Source: CivTech 2017

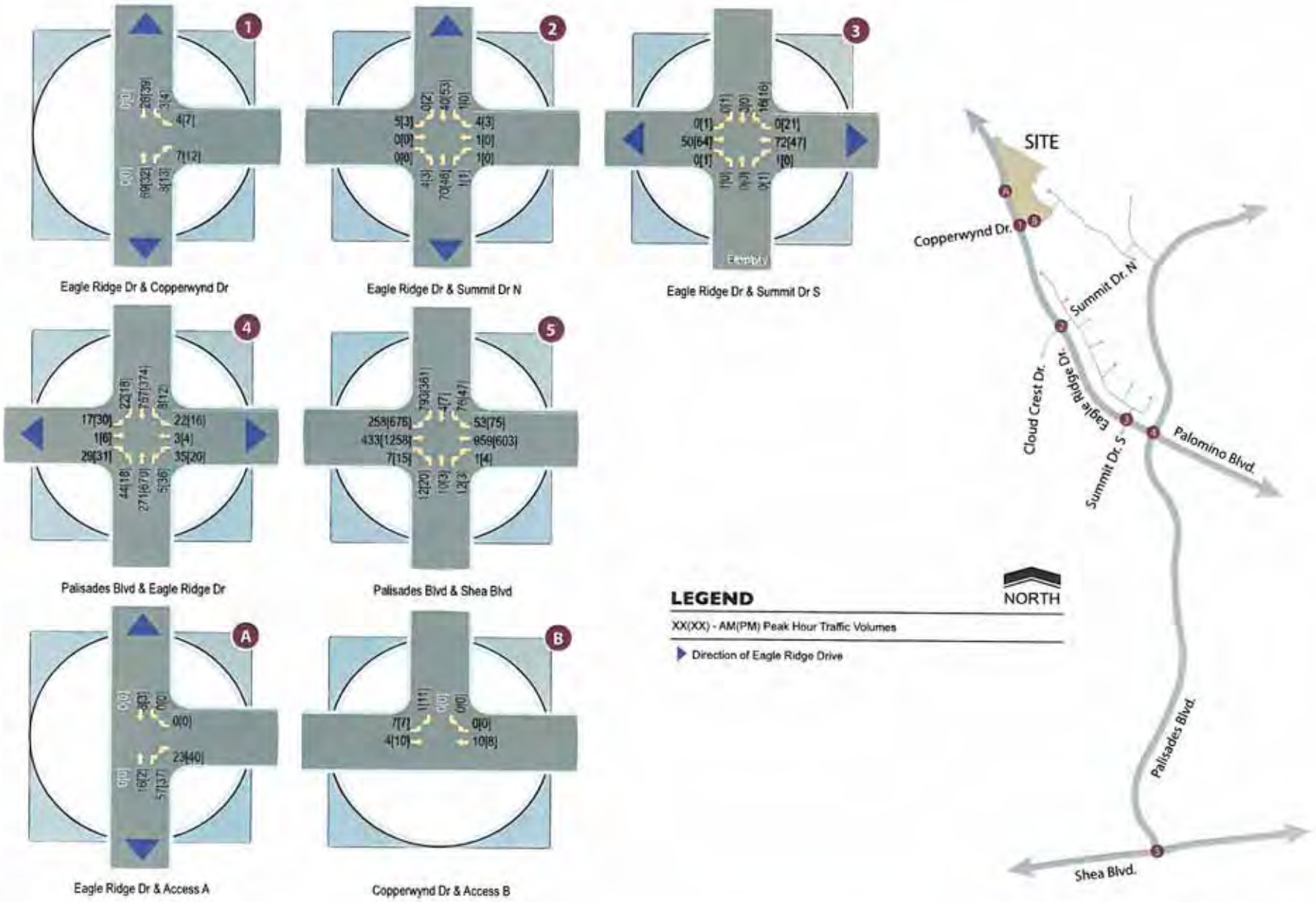


Figure 3: Existing Traffic Volumes

Source: CivTech 2017

EXISTING CAPACITY ANALYSIS

Peak hour capacity analyses have been conducted for the study intersections based on existing intersection configurations and traffic volumes. All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM), Special Report 209*, and Updated 2010 and using Synchro software, version 9.0 under the HCM 2010 methodology. The concept of level of service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The individual levels of service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions. Levels of service for intersections are defined in terms of delay ranges. **Table 2** lists the level of service criteria for signalized and unsignalized intersections, respectively.

Table 2: Level of Service Criteria

Level of Service	Control Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Source: Exhibit 18-4 and Exhibit 19-1, Highway Capacity Manual 2010

Results of the existing level of service analyses are shown in **Table 3** for the AM and PM peak hours. The existing conditions analysis worksheets have been included in **Appendix C**.

Table 3: Existing Peak Hour Levels-of-Service

ID	Intersection	Traffic Control	Movement/Approach	AM(PM) LOS Existing
1	Eagle Ridge Dr. & Copperwynd Dr.	1-Way Stop (EB)	WB Shared SB Left	A (A) A (A)
2	Eagle Ridge Dr. & Cloud Crest TR./Summit Drive North	2-Way Stop (EB/WB)	NB Left SB Left EB Shared WB Shared	A (A) A (A) A (A) A (A)
3	Summit Drive South & Eagle Ridge Dr.	2-Way Stop (NB/SB)	NB Shared SB Shared EB Left	A (A) A (A) A (A)
4	Palisades Blvd. & Eagle Ridge Dr./Palomino Blvd.	All-Way Stop	NB Approach SB Approach EB Approach WB Approach	B (D) D (B) B (B) B (B)
			Overall	**D (C)**
5	Palisades Blvd. & Shea Blvd.	Signal	NB Approach SB Approach EB Approach WB Approach	D (D) B (B) C (C) C (C)
			Overall	**C (C)**
A	Eagle Ridge Dr. & Driveway A	1-Way Stop (EB)	SB Left WB Shared	-- (--) A (A)
B	Eagle Ridge Dr. & Driveway B	1-Way Stop (SB)	SB Shared EB Shared	A (A) A (A)

All existing intersections are evaluated to operate at LOS D or better during the peak hours.

PROPOSED DEVELOPMENT

LAND USE AND INTENSITY

The renovation of the CopperWynd Resort and Club will include a total of 300 rooms and 9,850 square feet of meeting/banquet space at full build-out. The resort already includes 32 guestrooms (captured in existing traffic counts). Therefore, the remodel will create a net increase of approximately 268 guestrooms. The existing resort has a restaurant and a spa/fitness/tennis club. The club currently has approximately 300 members. A portion of the members walk from the surrounding neighborhood. The membership will remain the same with the renovations, and the restaurant patrons from off-site are not expected to increase. The existing traffic count includes the trips from the club members and restaurant. A conceptual site plan is included in **Figure 4**.

SITE ACCESS AND CIRCULATION

The site plan depicts maintaining the two (2) existing driveways as public entrances. The driveway on Eagle Ridge Drive is the main entrance and is expected to facilitate most of guest enter/exit trips. The secondary driveway to Copperwynd Drive is expected to be used for event days as well as potentially staff though a small amount of guests could be expected. The site plan also depicts an auxiliary driveway on Copperwynd Drive for deliveries.

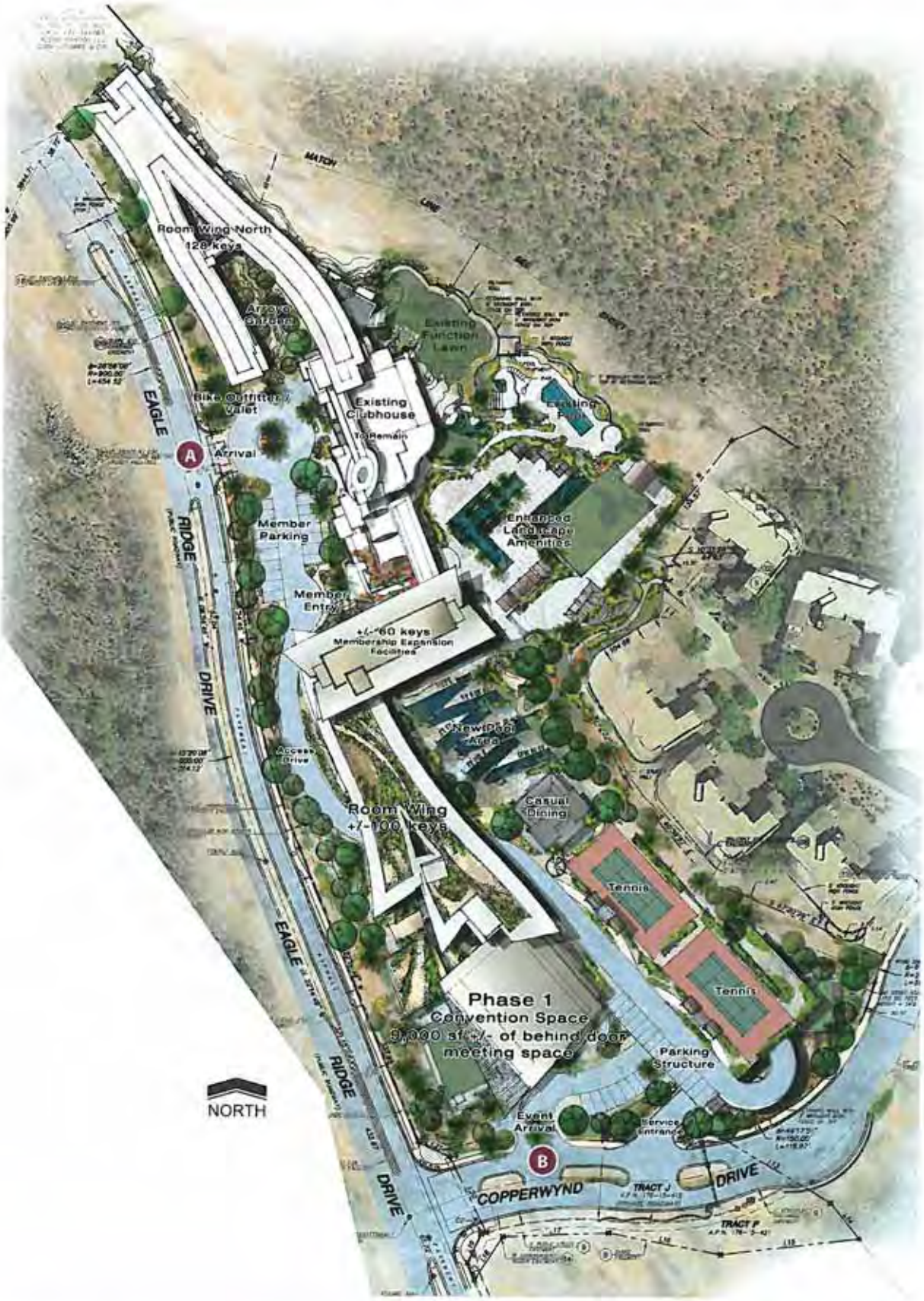


Figure 4: Site Plan and Access

Source: CivTech 2017

PHASING

The development is split into 3 phases. Phase 1 is assumed to open in 2018 with 128 total guestrooms. Sixty rooms will be added in Phase 2 and Phase 2 and Phase 3 will be market driven and dependent on available funding. For analysis purposes, Phase 2 is considered in 2023 and Phase 3 in 2028.

FUTURE TRAFFIC VOLUMES

TRIP GENERATION FOR PROPOSED EXPANSION

The potential trip generation for the proposed school was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition* and *Trip Generation Handbook, 3rd Edition*. The ITE *Trip Generation Manual* contains data collected by various transportation professionals for a wide range of different land uses. The data are summarized in the report and average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized land use. The report provides information for daily and peak hour trips.

The rates for LUC 310 (Hotel) are higher than those for LUC 330 (Resort Hotel) and therefore was utilized for a conservative analysis. ITE Land Use Category (LUC) 310 for a hotel has the following description: "Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops."

Most of the hotels surveyed were primarily location in suburban areas outside of central business districts.

The rates provided for the Hotel land use category are inclusive of all the uses on-site in addition to guest rooms. Therefore, separate trip generation was not conducted for the added meeting/banquet space. The peak period for the meeting/banquet space would most likely occur on a Saturday and not during the weekday peak hours.

The club membership will remain the same with the renovations, and the restaurant patrons from off-site are not expected to increase. The existing traffic count includes the trips from the club members and restaurant. Moreover, hotel restaurants and cocktail lounges are included in the Hotel rate.

The trips associated with 32 of the analyzed 300 guest rooms are already accounted for in the existing traffic counts. This analysis calculates the expected increase in trips due to the 268 additional rooms. **Table 4** summarizes the trip generation potential of the school. Detailed trip generation calculations are included in **Appendix D**.

Table 4: Trip Generation Summary

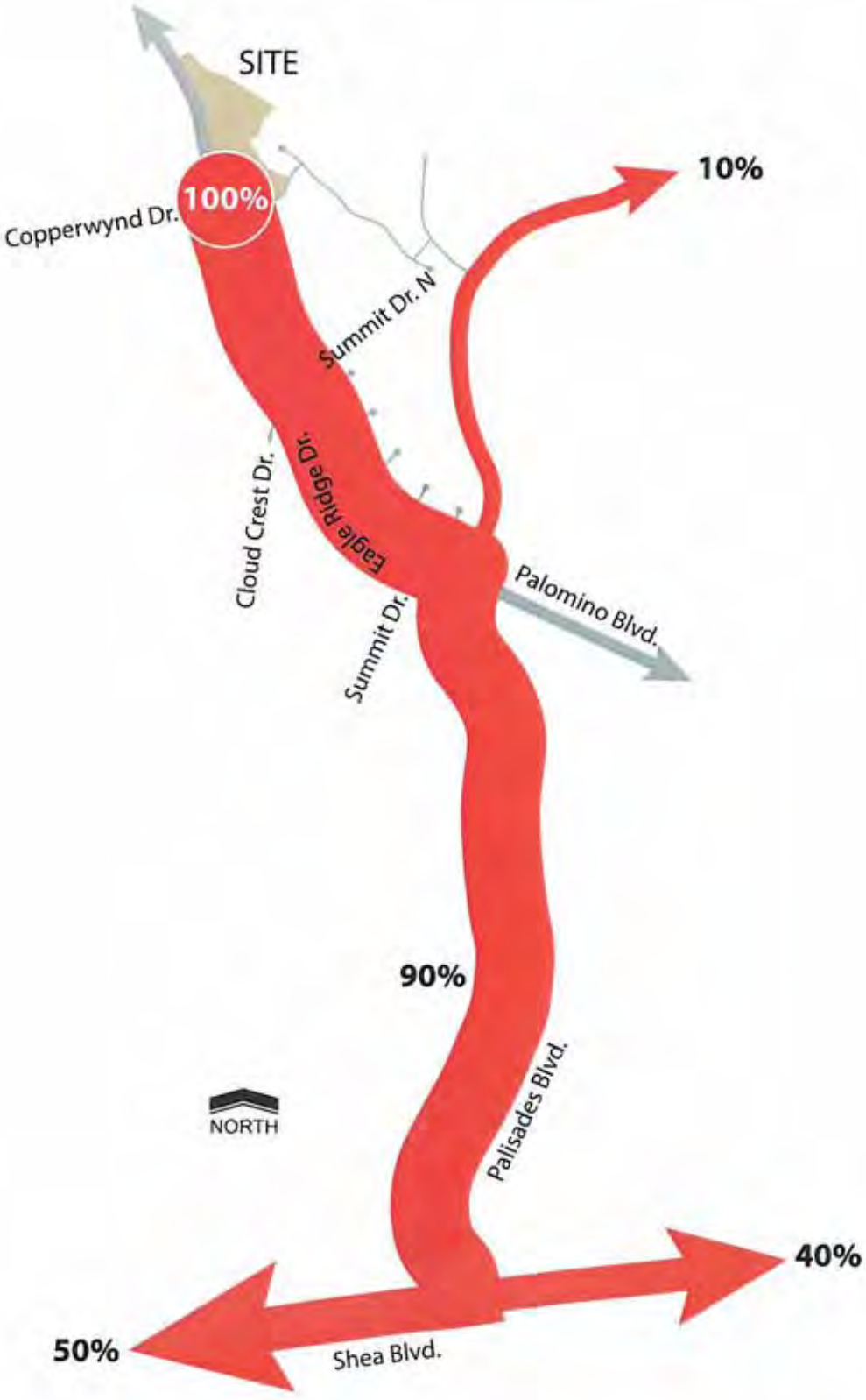
Land Use	ITE LUC	Occupied Rooms	Weekday Generated Trips					
			AM Peak Hour			PM Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Resort Hotel - Phase 1	310	96[1]	37	27	64	35	36	71
Resort Hotel - Phase 2	310	166[1]	64	47	111	60	63	123
Resort Hotel - Phase 3	310	268[1]	104	76	180	97	101	198

(1) Net increase in keyed guest rooms.

The proposed plan at full build-out is expected to generate an additional 180 trips (104 enter/76 exit) during the AM peak hour and an additional 198 trips (97 enter/101 exit) during the PM peak hour.

DISTRIBUTION AND TRIP ASSIGNMENT

A single trip distribution pattern was assumed for this study. It is expected that the proposed development would generate trips during the peak hours based predominantly on where guests are initially arriving from, such as an airport or residential areas further away from Fountain Hills. Most trips are expected to use Shea Boulevard, west towards Scottsdale or SR-87, southwest towards Loop 202 and the remaining on Palisades Boulevard to commercial areas in Fountain Hills. The trip distribution is shown in **Table 5** and depicted in **Figure 5**.



Source: CivTech 2017

Figure 5: Trip Distribution

Table 5: Trip Distribution by Percentage

Roadway	To/From	Distribution
Shea Boulevard	West	50%
Shea Boulevard (to/from SR-87)	East	40%
Palisades Boulevard	East	10%
TOTAL	**TOTAL**	**100%**

The percentages were applied to the site generated trips based on likely routes to project site traffic at the intersections within the study area. The projected Phase 1, Phase 2 and Phase 3 peak hour site traffic volumes are depicted in **Figure 6**, **Figure 7**, and **Figure 8**, respectively.

FUTURE BACKGROUND TRAFFIC

Additional traffic growth is expected to overall growth in the area. Future traffic volumes are commonly projected by applying a growth rate to existing traffic volumes. Historical ADT volumes on Shea Boulevard, retrievable on the City of Scottsdale's website indicated a decline in daily traffic volumes from 2012 to 2014. As such, this study refers to the methodology in the intersection needs assessment referenced above. The 2014 assessment considered a 2.9 percent annual growth rate, which is used in this study to be consistent. Actual growth may be less than projected as a 2.9 percent growth rate over a decade may be less likely given the limited area remaining for development in Fountain Hills. This rate equates to growth factors of 1.029, 1.187 and 1.370 for the 2018, 2023 and 2028 horizon years, respectively.

Adero Canyon is a development project adjacent to the northwest of the site on Eagle Ridge Drive. The development is currently under construction and is expected to add trips to the study area. The study *Palisades Boulevard and Eagle Ridge Drive Intersecting Needs Assessment*, sealed April 2014, projected traffic from the other/background development through the intersection of Eagle Ridge Drive and Palisades Boulevard. The assessment estimated a completion year of 2022. Those volumes were used and extrapolated to the remaining study intersections to add to existing traffic volumes in this the current study for the 2023 and 2028 horizon years. Selected excerpts from the assessment is included in **Appendix E**.

Future background traffic volumes at the study intersections are projected by applying the appropriate growth factor to the existing traffic volumes and, if applicable, adding the generated traffic volumes of the adjacent development. The 2018, 2023 and 2028 background traffic volumes are depicted in **Figure 9**, **Figure 10**, and **Figure 11**, respectively.

FUTURE TOTAL TRAFFIC

Anticipated total traffic volumes were computed by adding the site generated traffic to the projected background traffic volumes. The 2018, 2023 and 2028 total traffic volumes are depicted in **Figure 12**, **Figure 13**, and **Figure 14**, respectively.

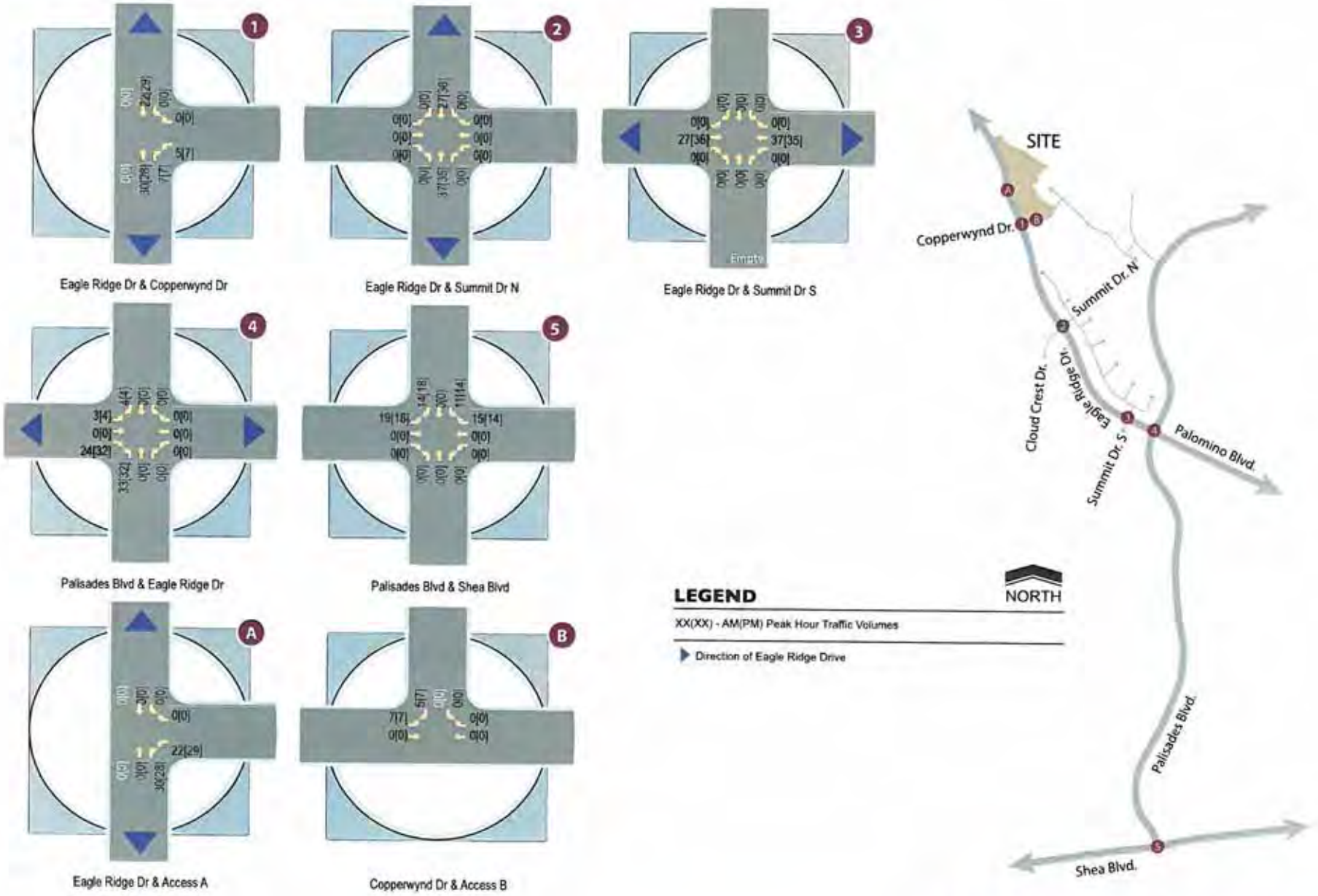


Figure 6: Site Phase I Traffic Volumes

Source: CivTech 2017

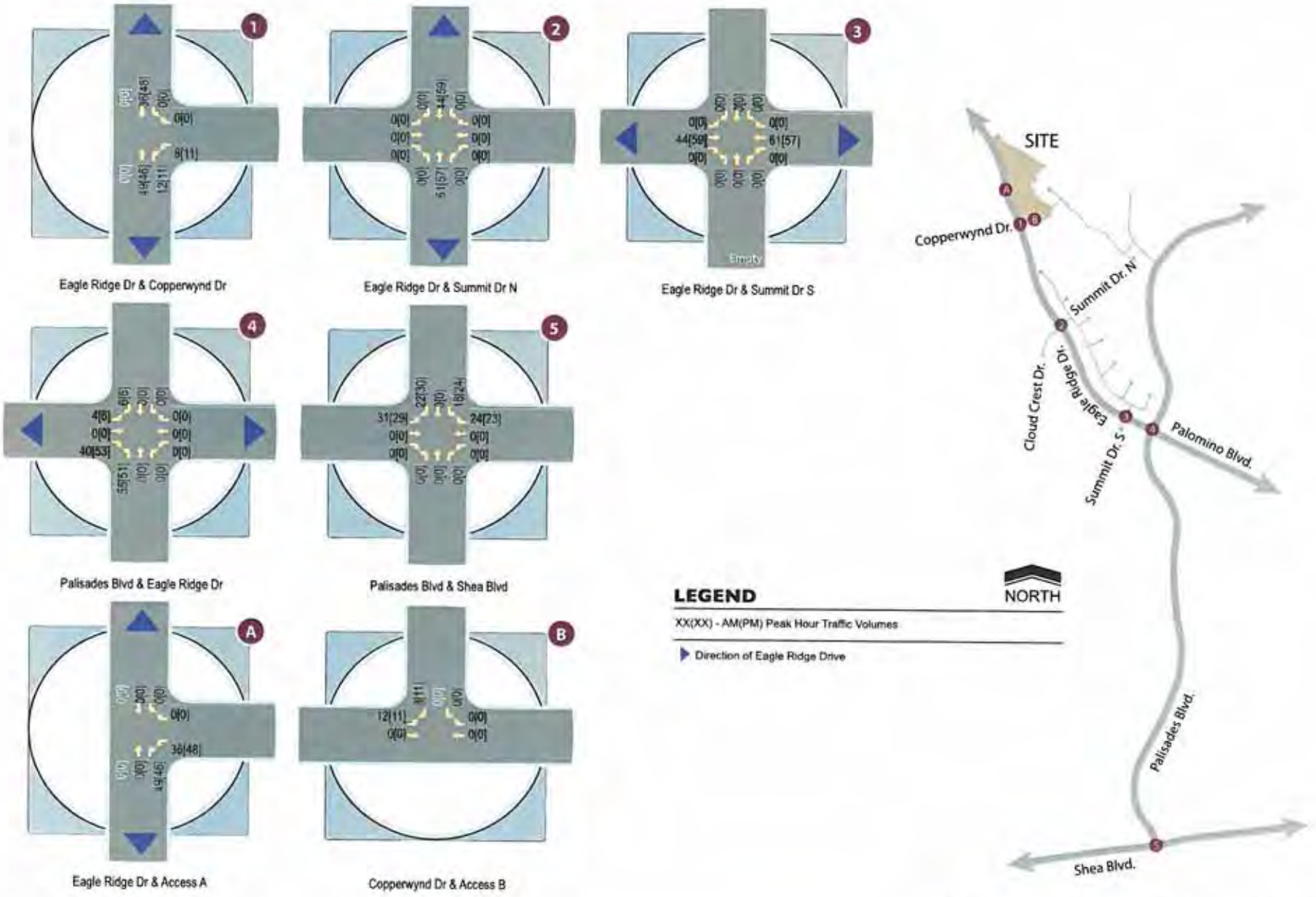


Figure 7: Site Phase 2 Traffic Volumes

Source: CivTech 2017

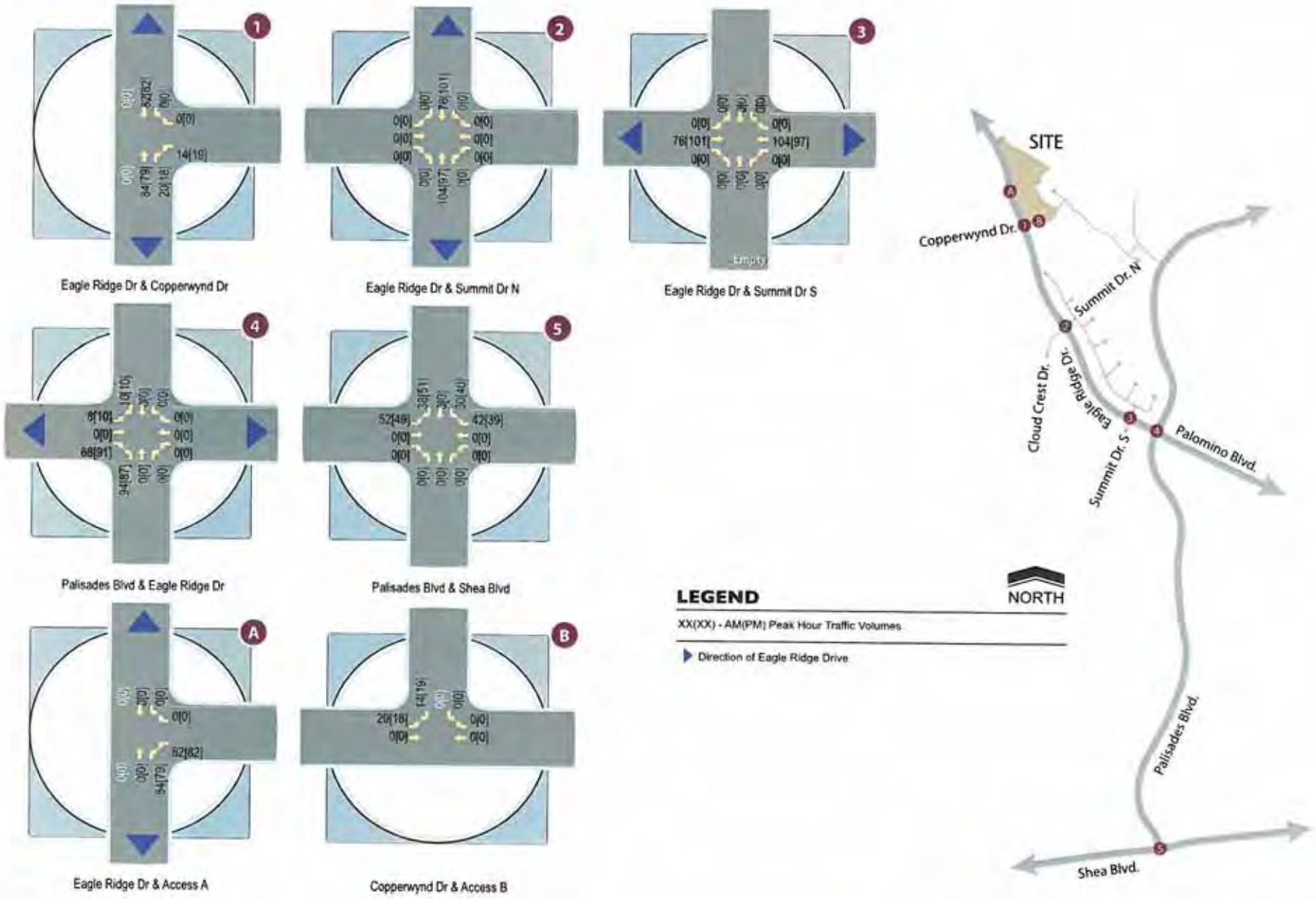


Figure 8: Site Phase 3 Traffic Volumes

Source: CivTech 2017

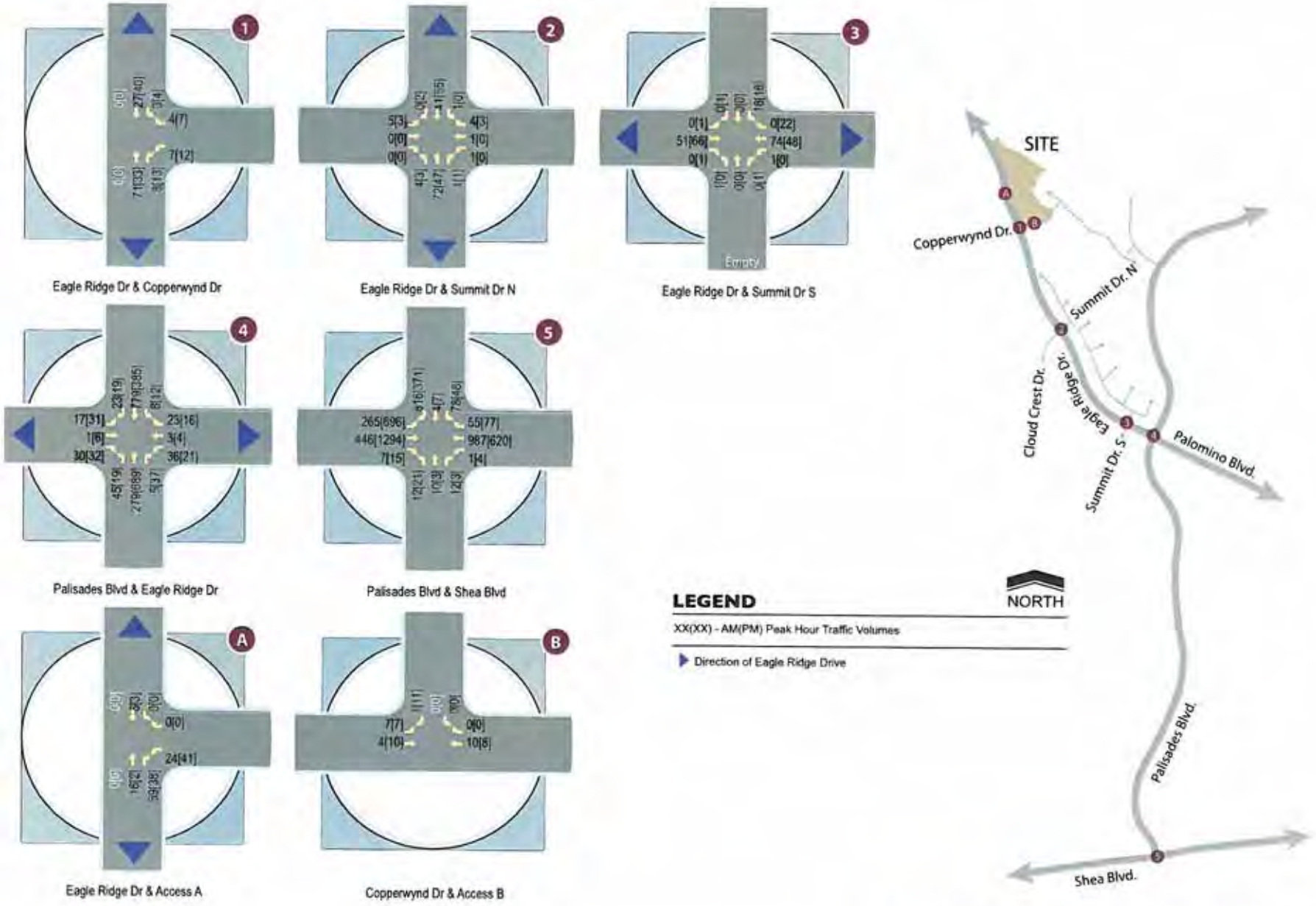


Figure 9: 2018 Background Traffic Volumes

Source: CivTech 2017

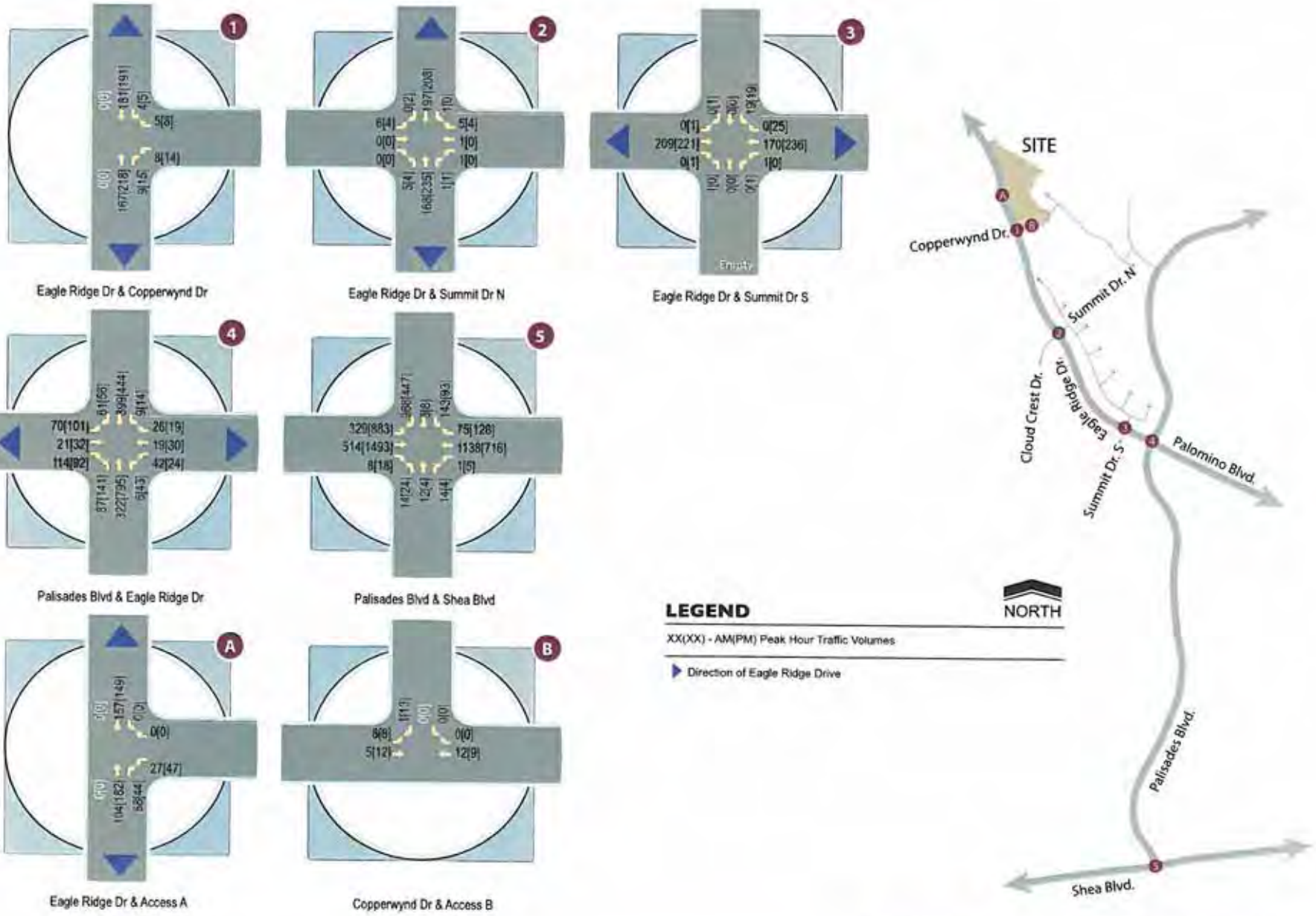


Figure 10: 2023 Background Traffic Volumes

Source: CivTech 2017

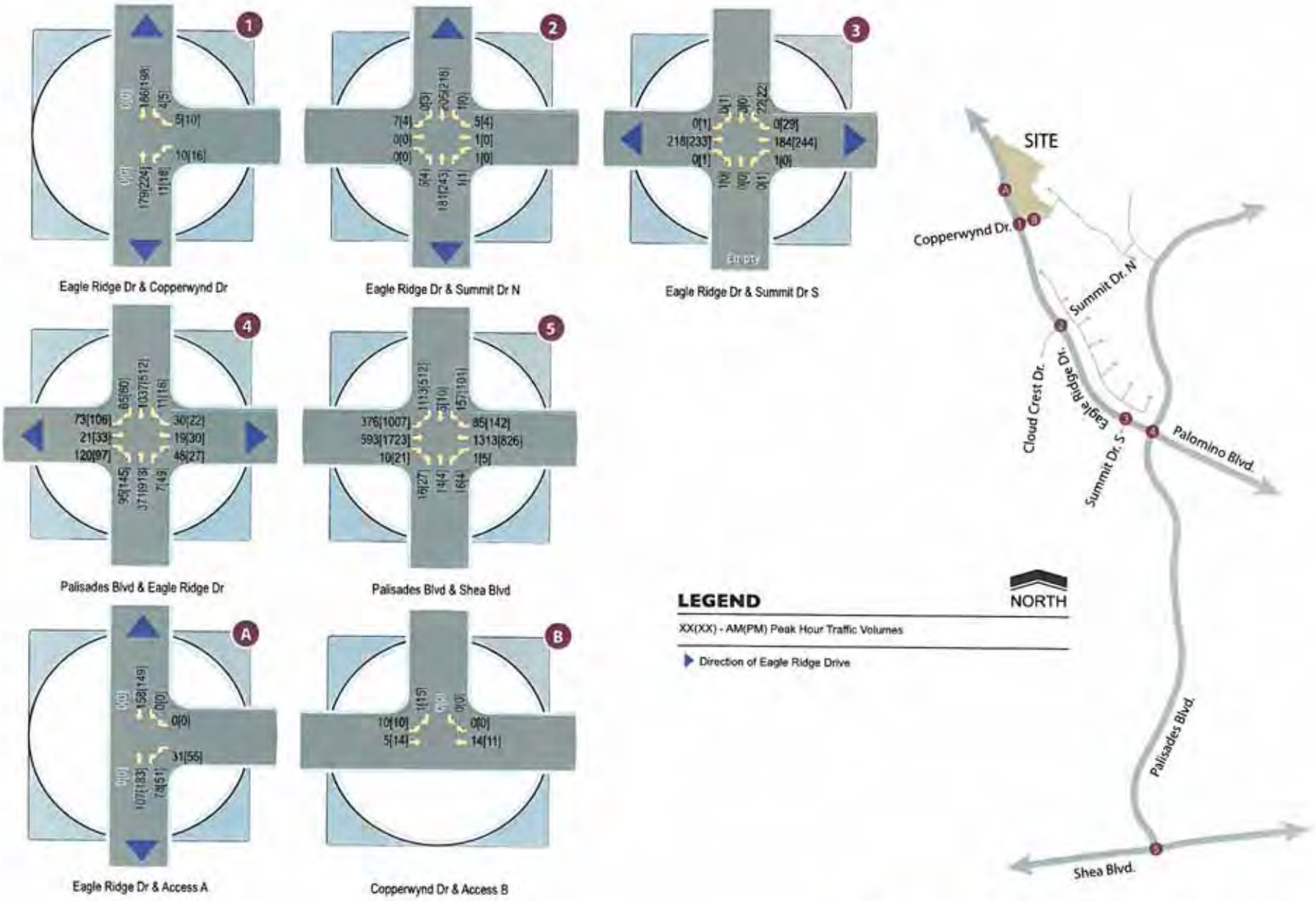


Figure 11: 2028 Background Traffic Volumes

Source: CivTech 2017

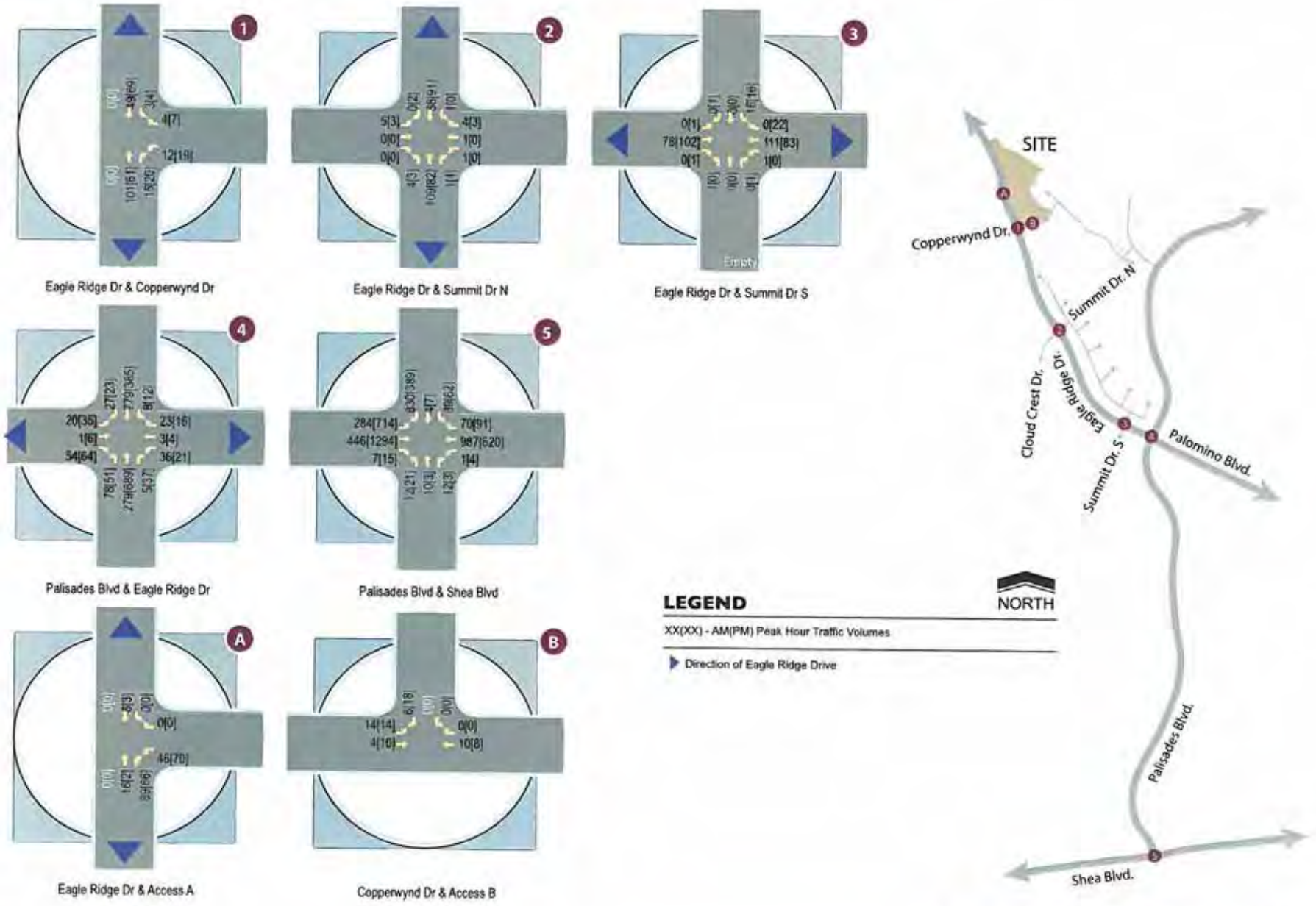


Figure 12: 2018 Total Traffic Volumes

Source: CivTech 2017

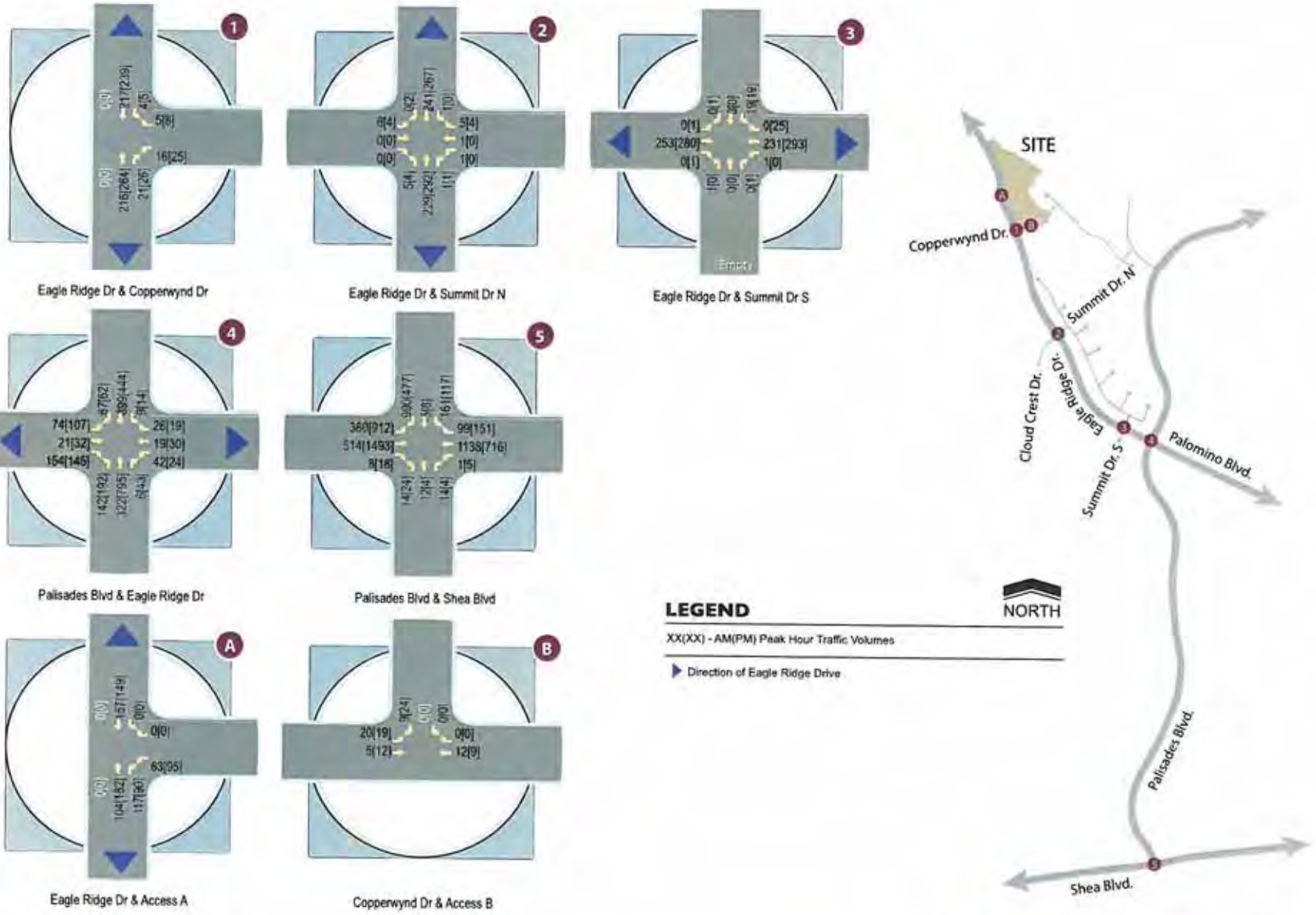


Figure 13: 2023 Total Traffic Volumes

Source: CivTech 2017

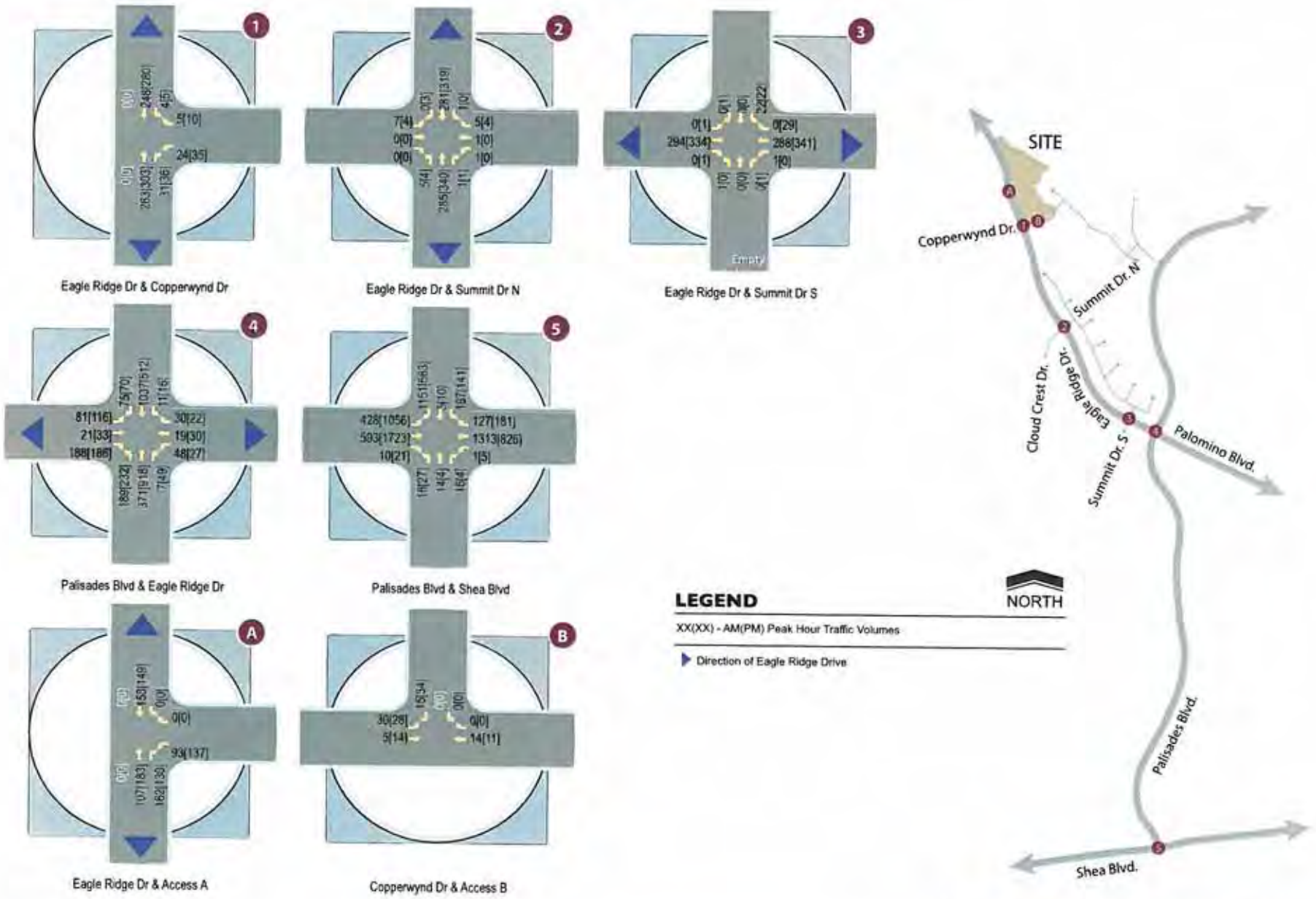


Figure 14: 2028 Total Traffic Volumes

Source: CivTech 2017

TRAFFIC AND IMPROVEMENT ANALYSIS

PEAK HOUR CAPACITY ANALYSIS

All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM), Special Report 209*, and Updated 2010 and using Synchro software under the HCM 2010 methodology.

Results of the intersection capacity analysis for the 2018, 2023 and 2028 study years are summarized in **Table 6**, **Table 7** and **Table 8**, respectively. Analysis worksheets for the future scenarios are in **Appendix F**, **Appendix G** and **Appendix H**, for years 2018, 2023 and 2028 respectively.

Table 6: 2018 Projected Peak Hour Levels of Service

ID	Intersection	Traffic Control	Movement/ Approach	AM(PM) LOS	
				Background	Total
1	Eagle Ridge Dr. & Copperwynd Dr.	1-Way Stop (EB)	WB Shared SB Left	A (A) A (A)	A (A) A (A)
2	Eagle Ridge Dr. & Cloud Crest TR./Summit Drive North	2-Way Stop (EB/WB)	NB Left SB Left EB Shared WB Shared	A (A) A (A) A (A) A (A)	A (A) A (A) A (A) A (A)
3	Summit Drive South & Eagle Ridge Dr.	2-Way Stop (NB/SB)	NB Shared SB Shared EB Left	A (A) A (A) A (A)	A (A) A (B) A (A)
4	Palisades Blvd. & Eagle Ridge Dr./Palomino Blvd.	All-Way Stop	NB Approach SB Approach EB Approach WB Approach	B (D) E (C) B (B) B (B)	B (D) E (C) B (B) B (B)
			Overall	**D (C)**	**D (C)**
5	Palisades Blvd. & Shea Blvd.	Signal	NB Approach SB Approach EB Approach WB Approach	D (D) B (B) C (C) C (C)	D (E) B (B) C (C) C (C)
			Overall	**C (C)**	**C (C)**
A	Eagle Ridge Dr. & Driveway A	1-Way Stop (EB)	SB Left WB Shared	– (–) A (A)	– (–) A (A)
B	Eagle Ridge Dr. & Driveway B	1-Way Stop (SB)	SB Shared EB Shared	A (A) A (A)	A (A) A (A)

Table 7: 2023 Projected Peak Hour Levels of Service

ID	Intersection	Traffic Control	Movement/ Approach	AM(PM) LOS	
				Background	Total
1	Eagle Ridge Dr. & Copperwynd Dr.	1-Way Stop (EB)	WB Shared	B (B)	B (B)
			SB Left	A (A)	A (A)
2	Eagle Ridge Dr. & Cloud Crest TR./Summit Drive North	2-Way Stop (EB/WB)	NB Left	A (A)	A (A)
			SB Left	A (A)	A (A)
			EB Shared	B (B)	B (B)
			WB Shared	B (A)	B (A)
3	Summit Drive South & Eagle Ridge Dr.	2-Way Stop (NB/SB)	NB Shared	B (A)	B (B)
			SB Shared	B (B)	B (B)
			EB Left	A (A)	A (A)
4	Palisades Blvd. & Eagle Ridge Dr./Palomino Blvd.	All-Way Stop	NB Approach	C (F)	D (F)
			SB Approach	F (D)	F (D)
			EB Approach	C (C)	C (C)
			WB Approach	B (B)	B (C)
			Overall	**E (E)**	**F (F)**
5	Palisades Blvd. & Shea Blvd.	Signal	NB Approach	D (D)	D (D)
			SB Approach	C (B)	C (B)
			EB Approach	C (E)	C (E)
			WB Approach	C (C)	C (C)
			Overall	**C (D)**	**C (D)**
A	Eagle Ridge Dr. & Driveway A	1-Way Stop (EB)	SB Left	-- (--)	-- (--)
			WB Shared	B (B)	B (B)
B	Eagle Ridge Dr. & Driveway B	1-Way Stop (SB)	SB Shared	A (A)	A (A)
			EB Shared	A (A)	A (A)

Table 8: 2028 Projected Peak Hour Levels of Service

ID	Intersection	Traffic Control	Movement/ Approach	AM(PM) LOS	
				Background	Total
1	Eagle Ridge Dr. & Copperwynd Dr.	1-Way Stop (EB)	WB Shared	B (B)	B (B)
			SB Left	A (A)	A (A)
2	Eagle Ridge Dr. & Cloud Crest TR./Summit Drive North	2-Way Stop (EB/WB)	NB Left	A (A)	A (A)
			SB Left	A (A)	A (A)
			EB Shared	B (B)	B (C)
			WB Shared	B (A)	B (B)
3	Summit Drive South & Eagle Ridge Dr.	2-Way Stop (NB/SB)	NB Shared	B (A)	B (B)
			SB Shared	B (B)	C (C)
			EB Left	A (A)	A (A)
4	Palisades Blvd. & Eagle Ridge Dr./Palomino Blvd.	All-Way Stop	NB Approach	C (F)	E (F)
			SB Approach	F (E)	F (F)
			EB Approach	C (C)	C (D)
			WB Approach	B (C)	C (C)
			Overall	**E (F)**	**F (F)**
5	Palisades Blvd. & Shea Blvd.	Signal	NB Approach	D (E)	D (E)
			SB Approach	C (B)	D (B)
			EB Approach	C (F)	C (F)
			WB Approach	C (C)	C (C)
			Overall	**C (E)**	**D (E)**
A	Eagle Ridge Dr. & Driveway A	1-Way Stop (EB)	SB Left	-- (--)	-- (--)
			WB Shared	B (B)	B (B)
B	Eagle Ridge Dr. & Driveway B	1-Way Stop (SB)	SB Shared	A (A)	A (A)
			EB Shared	A (A)	A (A)

Most study intersections are projected to operate at LOS C or better during the peak hours of all horizon years. Two of the intersections are expected to operate at LOS E or F during one or more peak hour in 2023 and/or 2028.

The intersection of ***Palisades Boulevard and Shea Boulevard*** is anticipated to operate at LOS E during the 2028 PM peak hour. This is due to the relatively high eastbound left turn movement where dual turn lanes facilitate a projected PM peak hour volume of 1,035 vehicles. Further analysis reveals that if the maximum green interval for the movement was increased to similar to the maximum green interval of the eastbound through movement, the intersection could operate at LOS C during the 2028 PM peak hour. Actual growth may be less than projected as a 2.9 percent growth rate over a decade may be less likely given the limited area remaining for development in Fountain Hills. It is still recommended to ensure that the maximum green time is increased as future traffic volumes increase to ensure adequate operation.

The intersection of ***Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard*** is anticipated to operate at LOS E or F in the 2023 and 2028 background and total conditions. This is mostly due to the relatively large through volume on Palisades Boulevard in relation to the increasing volume entering/exiting Eagle Ridge Drive. Signalization would mitigate the proposed delay associated with an all-way stop condition. The *Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014)* indicated that a the four-hour signal warrant is expected to be satisfied with the neighboring Adero Canyon development and trailhead at 17 percent of occupancy of planned townhomes and satisfying the eight-hour signal warrant at 29 percent occupancy.

Depending on the timing of the build out of surrounding developments and growth of background traffic volumes, a traffic signal may be warranted at full build-out of Phase 2 or Phase 3. Per the Town of Fountain Hills, a northbound left-turn lane on Palisades Boulevard shall be installed along with box and conduit to prepare for a future traffic signal. These improvements are recommended to be constructed prior to Phase 3 of the development.

Per the *Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014)*, "CivTech is concerned that there may not be sufficient sight distance for drivers intending to turn right on red from the side streets to see approaching vehicles on Palisades Boulevard or for drivers intending to turn left from Palisades Boulevard to see opposing vehicles. Therefore, if and when a traffic signal is installed, we recommend prohibiting right turns on red for the east- and westbound approaches and we recommend protected-only left turn phasing for the left turns in both directions from Palisades Boulevard."

Due to the sight distance restrictions, it is recommended to prohibit right turns on red for the eastbound and westbound approaches and provide protected-only left turn phasing for the left turns in both directions from Palisades Boulevard. A formal assessment should be conducted during the traffic signal design process.

Table 9 summarizes the level-of-service with a traffic signal at the ***Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard*** intersection.

Table 9: Projected Peak Hour Levels of Service with a Traffic Signal

ID	Intersection	Traffic Control[1]	Movement/ Approach	AM(PM) LOS[1]	
				2023	2028
4	Palisades Blvd. & Eagle Ridge Dr./Palomino Blvd.	Traffic Signal (NB left installed)	NB Approach	B (B)	C (B)
			SB Approach	C (B)	C (B)
			EB Approach	C (C)	C (B)
			WB Approach	C (B)	C (B)
			Overall	**19.3s: B (14.7s: B)**	**28.3s: C (16.1s: B)**
4	Palisades Blvd. & Eagle Ridge Dr./Palomino Blvd.	Traffic Signal (NB left and EB right installed)	NB Approach	B (B)	C (B)
			SB Approach	B (B)	C (B)
			EB Approach	C (C)	C (B)
			WB Approach	B (B)	C (B)
			Overall	**17.1s: B (14.0s: B)**	**23.8: C (14.4s: B)**

1. The level-of-service (LOS) was calculated with right turns on red prohibited for the eastbound and westbound approaches and protected-only left turn phasing in the northbound and southbound directions. For year 2023, a 60-second cycle was utilized. For year 2028, a 65-second cycle was utilized for the AM peak hou,r and a 60-second cycle was utilized for the PM peak hour.

With the installation of a traffic signal, the intersection of ***Palisades Boulevard and Eagle Ridge Drive*** will operate at a level-of-service "B" in year 2023 for both peak hours. For year 2028, the intersection is projected to operate an overall level-of-service "C" during the AM peak hour and "B" during the PM peak hour.

Two scenarios were analyzed to determine the impact of installing an eastbound right-turn lane on Eagle Ridge Drive at Palisades Boulevard. The overall level-of-service would remain the same. However, there would be a few seconds less of overall delay.

In year 2028, the eastbound through movement on Eagle Ridge Drive at Palisades Boulevard is projected to be only 21 vph in the AM peak hour and 33 vph in the PM peak hour. The eastbound right-turn volume is projected to be 188 vph in both the AM and PM peak hours. These volumes do not warrant a separate eastbound right-turn lane. Per the analysis, the overall delay would only improve by a few seconds.

In addition, right turns on red are recommended to be prohibited in the eastbound and westbound directions due to sight distance. Therefore, a separate right-turn lane is not deemed necessary on Eagle Ridge Drive at Palisades Boulevard.

The future lane configurations and traffic controls are depicted in **Figure 15**.

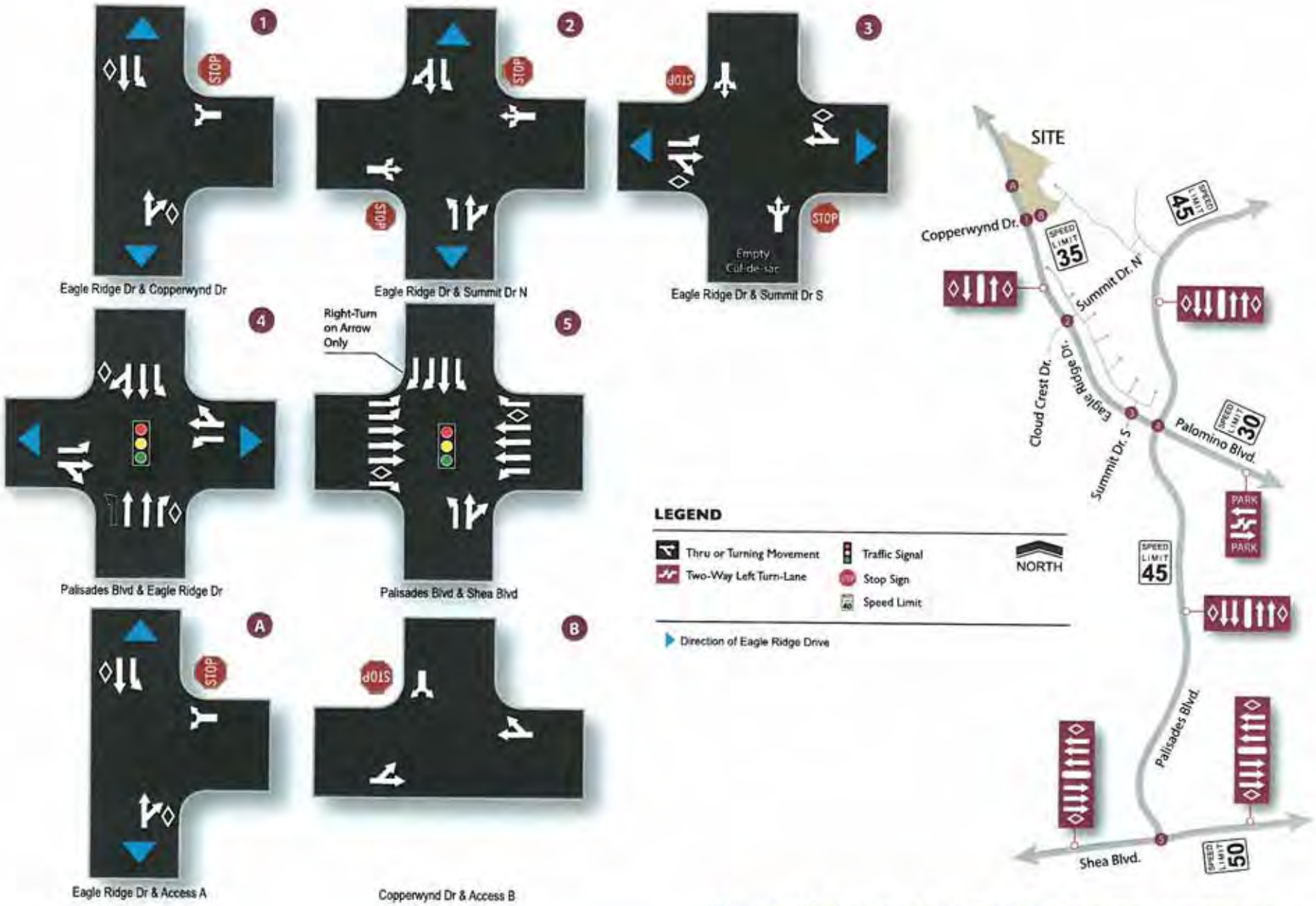


Figure 15: Future Lane Configurations and Traffic Controls

Source: CivTech 2017

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been documented in this study.

Site Plan and Access

- Renovations are proposed for the CopperWynd Resort and Club in Fountain Hills, Arizona. Redevelopment is proposed in phases and will consist of a total of 300 rooms and an addition of 9,850 square feet of meeting/banquet space at full build-out. A restaurant and fitness/tennis club is currently on-site and will remain with the redevelopment. A conceptual site plan is included in **Figure 4**.

- The site plan depicts maintaining the two (2) existing driveways as public entrances. The driveway on Eagle Ridge Drive is the main entrance and is expected to facilitate most of guest enter/exit trips. The secondary driveway to Copperwynd Drive is expected to be used for event days as well as potentially staff though a small amount of guests could be expected. The site plan also depicts an auxiliary driveway on Copperwynd Drive for deliveries.

Trip Generation

- The rates provided for the *ITE Trip Generation* "Hotel" land use category are inclusive of all the uses on-site in addition to guest rooms. Therefore, separate trip generation was not conducted for the added meeting/banquet space. The peak period for the meeting/banquet space would most likely occur on a Saturday and not during the weekday peak hours.

- The club membership will remain the same with the renovations, and the restaurant patrons from off-site are not expected to increase. The existing traffic count includes the trips from the club members and restaurant. Moreover, hotel restaurants and cocktail lounges are included in the "Hotel" rate.

- The trips associated with 32 of the analyzed 300 guest rooms are already accounted for in the existing traffic counts. This analysis calculates the expected increase in trips due to the 268 additional rooms.

- The proposed plan at full build-out is expected to generate an additional 180 trips (104 enter/76 exit) during the AM peak hour and an additional 198 trips (97 enter/101 exit) during the PM peak hour.

Level of Service Analysis

- All existing intersections are evaluated to operate at LOS D or better during the peak hours.

- The study intersections are projected to operate at LOS C or better during the peak hours of all horizon years with the exception of ***Palisades Boulevard and Shea Boulevard*** and ***Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard***. These two intersections are expected to operate at LOS E or F during one or more peak hour in 2023 and/or 2028.

Palisades Boulevard and Shea Boulevard

- The intersection of ***Palisades Boulevard and Shea Boulevard*** is anticipated to operate at LOS E during the 2028 PM peak hour. This is due to the relatively high eastbound left turn movement where dual turn lanes facilitate a projected PM peak hour volume of 1,035 vehicles. Further analysis reveals that if the maximum green interval for the movement was increased to similar to the maximum green interval of the eastbound through movement, the intersection could operate at LOS C during the 2028 PM peak hour. Actual growth may be less than projected as a 2.9 percent growth rate over a decade may be less likely given the limited area remaining for development in Fountain Hills. It is still recommended to ensure that the maximum green time is increased as future traffic volumes increase to ensure adequate operation.

Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard

- The intersection of ***Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard*** is anticipated to operate at LOS E or F in the 2023 and 2028 background and total conditions. This is mostly due to the relatively large through volume on Palisades Boulevard in relation to the increasing volume entering/exiting Eagle Ridge Drive. Signalization would mitigate the proposed delay associated with an all-way stop condition. The *Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014)* indicated that a the four-hour signal warrant is expected to be satisfied with the neighboring Adero Canyon development and trailhead at 17 percent of occupancy of planned townhomes and satisfying the eight-hour signal warrant at 29 percent occupancy.

- Depending on the timing of the build out of surrounding developments and growth of background traffic volumes, a traffic signal may be warranted at full build-out of Phase 2 or Phase 3. Per the Town of Fountain Hills, a northbound left-turn lane on Palisades Boulevard shall be installed along with box and conduit to prepare for a future traffic signal. These improvements are recommended to be constructed prior to Phase 3 of the development.

- Per the *Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014)*, "CivTech is concerned that there may not be sufficient sight distance for drivers intending to turn right on red from the side streets to see approaching vehicles on Palisades Boulevard or for drivers intending to turn left from Palisades Boulevard to see opposing vehicles. Therefore, if and when a traffic signal is installed, we recommend prohibiting right turns on red for the east- and westbound approaches and we recommend protected-only left turn phasing for the left turns in both directions from Palisades Boulevard."

- Due to the sight distance restrictions, it is recommended to prohibit right turns on red for the eastbound and westbound approaches and provide protected-only left turn phasing for the left turns in both directions from Palisades Boulevard. A formal assessment should be conducted during the traffic signal design process.

LIST OF REFERENCES

A Policy on Geometric Design of Highways and Streets. American Association of State Highway and Transportation Officials, Washington, D.C., 2011.

Highway Capacity Manual. Transportation Research Board, Washington, D.C., 2010.

Manual on Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

NPTS Urban Travel Patterns Report: December 1999.

Trip Generation Manual, 9th Edition. Institute of Transportation Engineers, Washington, D.C, 2012.

Trip Generation Handbook, 3rd Edition, Institute of Transportation Engineers, Washington, D.C., 2014.

TECHNICAL APPENDIX

APPENDIX A:	REVIEW COMMENTS RESPONSES (RESERVED)
APPENDIX B:	EXISTING TRAFFIC COUNTS
APPENDIX C:	EXISTING PEAK HOUR CAPACITY ANALYSIS
APPENDIX D:	TRIP GENERATION
APPENDIX E:	SELECTED EXCERPTS FROM PALISADES BOULEVARD AND EAGLE RIDGE DRIVE INTERSECTING NEEDS ASSESSMENT
APPENDIX F:	2018 PEAK HOUR ANALYSIS
APPENDIX G:	2023 PEAK HOUR ANALYSIS
APPENDIX H:	2028 PEAK HOUR ANALYSIS

APPENDIX A

REVIEW COMMENTS AND RESPONSES (RESERVED)

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
1.	Page 1 (&throughout the report)-Add to the trip generation, the traffic for the : Convention Center-8,850 SF, Community Members' increased usage of the increased/expanded facilities, function lawn events, and restaurant.	Per the hotel, ***The club membership will remain the same with the renovations***, and the restaurant patrons from off-site are not expected to increase. The existing traffic count includes the trips from the club members and restaurant. ***Due to Town concern, the trip generation is now calculated with rates for ITE LUC 310 (Hotel)***, which are higher than ITE LUC 330 (Resort Hotel). ITE Land Use Category (LUC) 310 for a hotel has the following description: "Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops." The rates provided for the "Hotel" land use category are inclusive of all the uses on-site in addition to guest rooms. Therefore, separate trip generation was not conducted for the added meeting/banquet space. The peak period for the meeting/banquet space would most likely occur on a Saturday and not during the weekday peak hours. The function lawn events are expected to be ancilliary to the indoor meeting/banquet space and not separate.
2.	Page 1 - A portion of Eagle Ridge Drive (ERD) lies within the City of Scottsdale. Also submit this report to Scottsdale & incorporate their review comments.	Documents have been submitted to the City of Scottsdale's planning department.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
3.	Page 2 - Delete the 2nd bullet point, and replace with verbiage to "Construct/participate in intersection improvements/signalization of the Palisades Blvd//Eagle Ridge Drive intersection."	This text has been added to report "Depending on the timing of the build out of surrounding developments and growth of background traffic volumes, a traffic signal may be warranted at full build-out of Phase 2 or Phase 3. Per the Town of Fountain Hills, a northbound left-turn lane on Palisades Boulevard shall be installed along with traffic signal conduit and pull boxes to prepare for a future traffic signal. These improvements are recommended to be constructed prior to Phase 3 of the development."
4.	Figure 2 (& throughout the report): Eagle Ridge Drive's direction switches in these diagrams. So, clarify/label street names in all diagrams/figures.	Labels added.
5.	Page 12, 3rd Para - "of the school.. " ????	Typo corrected.
6.	Table 4 - Add the traffic generators noted above.	Refer to **Item 1**.
7.	Page 14, "3rd Para-" growth factors of 1.01, 1.062, 1.116..."-Since the text indicates that a growth factor of 2.9% per year was used, how do these numbers relate?	Typo corrected. 2.9% per year was utilized in analysis.
8.	Figure 14: The site generates up to 41% of the largest side street movements (NB-WB LT and EB-SB RT movements) at the Palisades/ERD intersection. So, participate in intersection improvements/signalization improvements.	Refer to **Item 3**.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
9.	Evaluate the line of sight for EB-SB RT on red at the future traffic signal at Palisades/Eagle Ridge.	A field check of sight distance at this intersection was not conducted for this project. However, per the Palisades Boulevard and Eagle Ridge Drive Intersection Needs Assessment (CivTech April 16, 2014), "CivTech is concerned that there may not be sufficient sight distance for drivers intending to turn right on red from the side streets to see approaching vehicles on Palisades Boulevard or for drivers intending to turn left from Palisades Boulevard to see opposing vehicles. Therefore, if and when a traffic signal is installed, we recommend prohibiting right turns on red for the east- and westbound approaches and we recommend protected-only left turn phasing for the left turns in both directions from Palisades Boulevard." Due to the sight distance restrictions, it is recommended to prohibit right turns on red for the eastbound and westbound approaches and provide protected-only left turn phasing for the left turns in both directions from Palisades Boulevard. A formal assessment should be conducted during the Signal Design process.
10.	Table 7: Palisades/ERD: NB approach-add a left turn pocket, due to LOS C (F). All-way Stop, Overall - A traffic signal will be needed, due LOS E€. Provide an LOS analysis for a traffic signal.	Refer to **Item 3**. A LOS analysis with a traffic signal has been added to the TIA.
11	Page 26, last para-"...signalization is expected to occur at signalization is expected..."????	Typo corrected.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Town of Fountain Hills-February 22, 2017**

Item	Review Comment	(Code) & Response
12.	In lieu of participation in a future intersection improvement and traffic signalization project at Palisades/ERD, provide: Phase 1- Add a NB-WB LT pocket on Palisades at Eagle Ridge Dr. (eliminating the former WB-SB acceleration lane width.) Phase 1-Add a EB-SB RT pocket on Eagle Ridge Drive at Palisades (by narrowing the median and restriping the approach traffic lanes, without a striped bike lane). Phase 2 (or equivalent participation in the Town's future traffic signal project, whichever occurs first)-Construct traffic signal conduit and pull boxes at all approaches to the Palisades/ERD intersection.	Refer to **Item 3**. Adding turn lanes with the all-way stop condition would only minimally improve the LOS. The northbound and southbound through movments dictate the low level-of-service, which is mitiagated with a traffic signal. Two scenarios were analyzed to determine the impact of installing an eastbound right-turn lane with a Traffic Signal on Eagle Ridge Drive at Palisades Boulevard. The overall level-of-service would remain the same. However, there would be a few seconds less of overall delay. In year 2028, the eastbound through movement on Eagle Ridge Drive at Palisades Boulevard is projected to be only 21 vph in the AM peak hour and 33 vph in the PM peak hour. The eastbound right-turn volume is projected to be 188 vph in both the AM and PM peak hours. These volumes do not warrant a separate eastbound right-turn lane. Per the analysis, the overall delay would only improve by a few seconds. In addition, right turns on red are recommended to be prohibited in the eastbound and westbound directions due to sight distance. Therefore, a separate right-turn lane is not deemed necessary on Eagle Ridge Drive at Palisades Boulevard.
13.	Figure 15-Show the future Traffic Signal at Palisades/Eagle Ridge Drive	A Traffic Signal was shown with first submittal on the intersection detail. The map on the side doesn't show intersection control, but rather the intersection IDs.
14.	Page 28, 2nd bullet point - Copperwynd Drive is a private street belonging to ____(others?). Provide adequate evidence of your legal right to make this increase in traffic loading onto this street.	CopperWynd Drive is owned by the primary entity, Palisades Resorts, LLC.
15.	"A large portion of members walk..." large %? 25% in table.	The table isn't representative of all members, only those in attendance that day. The hotel commented that many walk. The word 'large' has been removed.

APPENDIX B

EXISTING TRAFFIC COUNTS

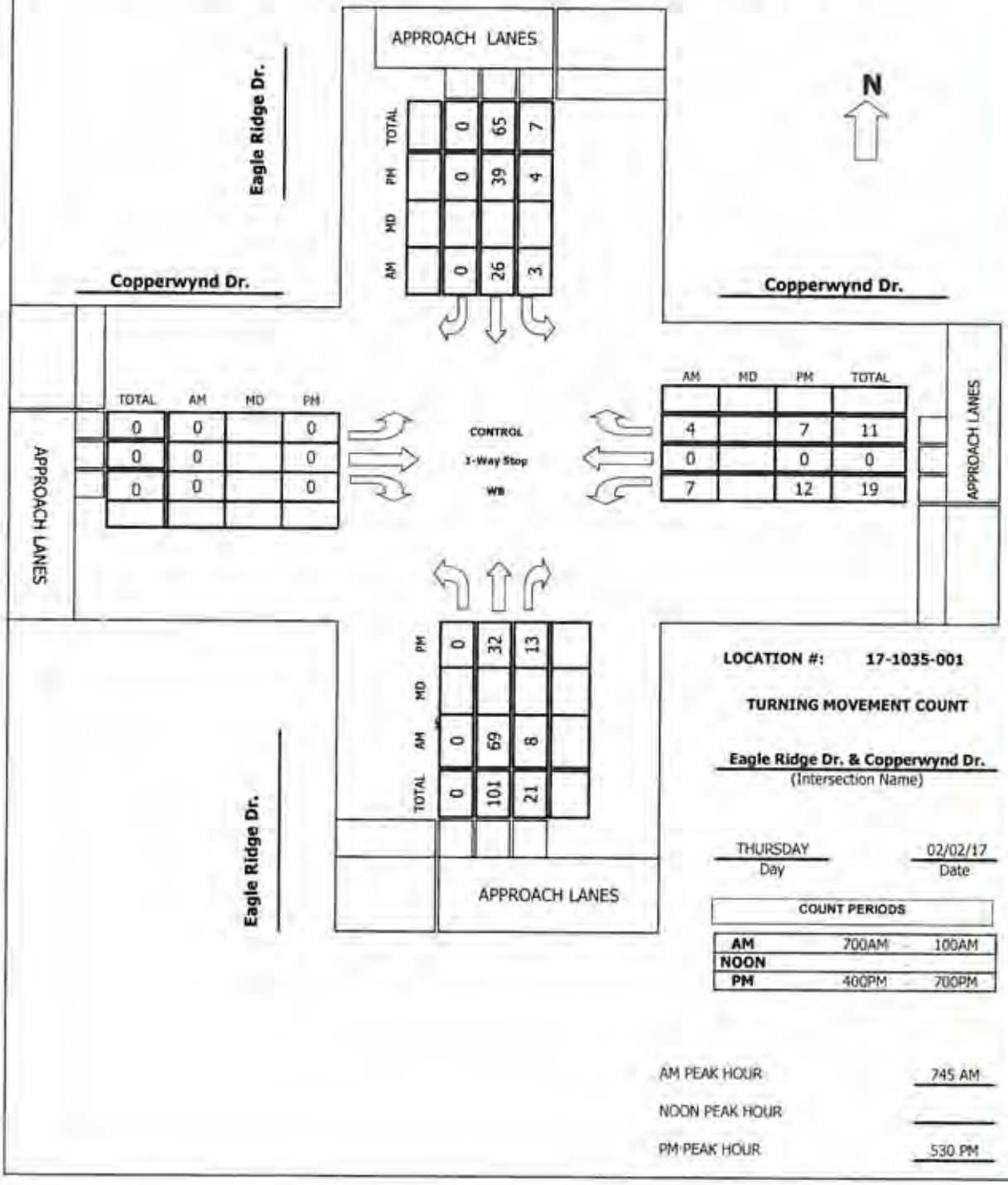
CivTech

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 17-1035-001

TMC SUMMARY OF Eagle Ridge Dr. & Copperwynd Dr.



LOCATION #: 17-1035-001

TURNING MOVEMENT COUNT

Eagle Ridge Dr. & Copperwynd Dr.
(Intersection Name)

THURSDAY (Day) 02/02/17 (Date)

COUNT PERIODS		
AM	700AM	100AM
NOON		
PM	400PM	700PM

AM PEAK HOUR 745 AM

NOON PEAK HOUR

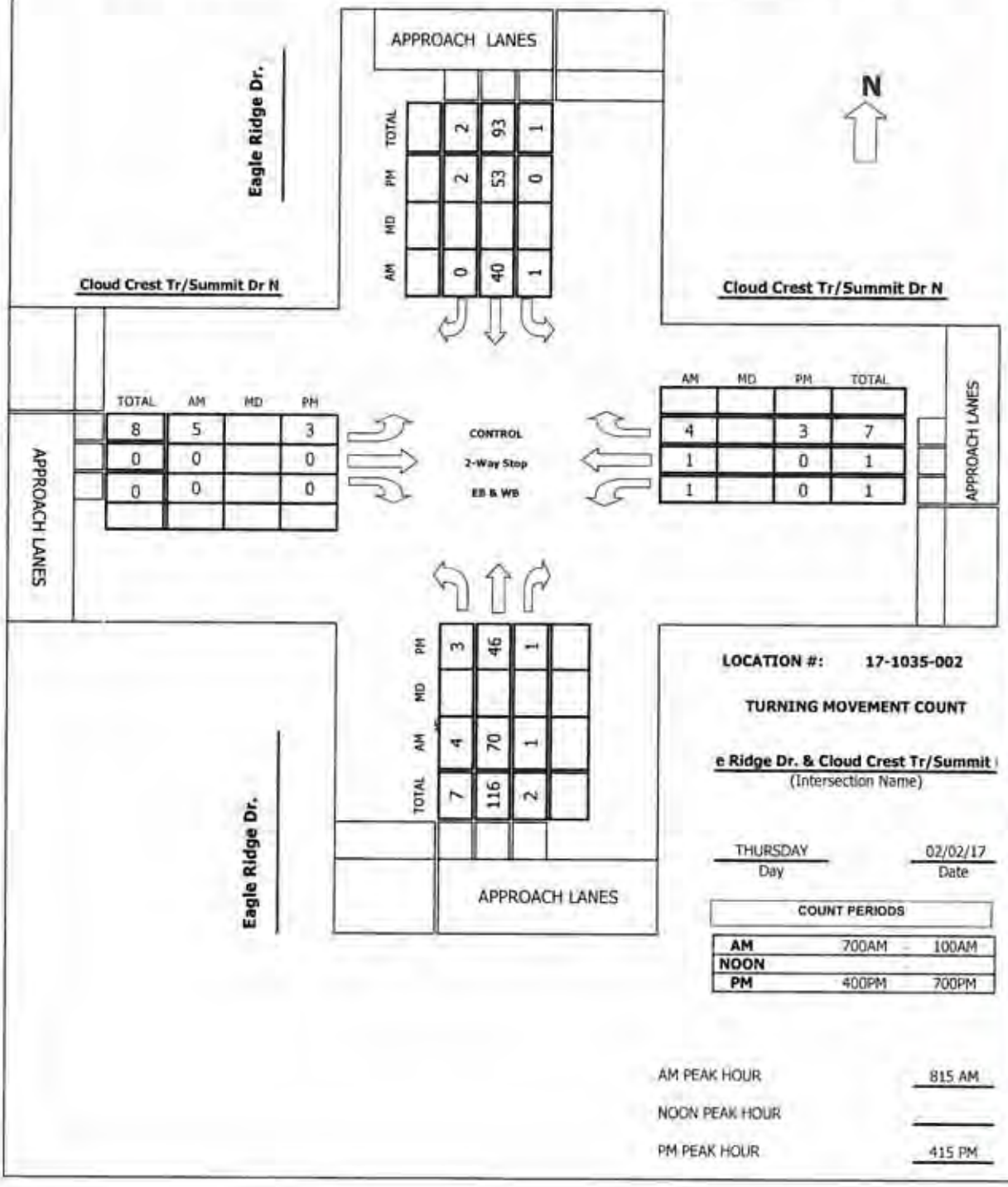
PM PEAK HOUR 530 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 17-1035-002

TMC SUMMARY OF Eagle Ridge Dr. & Cloud Crest Tr/Summit Dr N



LOCATION #: 17-1035-002

TURNING MOVEMENT COUNT

e Ridge Dr. & Cloud Crest Tr/Summit
(Intersection Name)

THURSDAY (Day) 02/02/17 (Date)

COUNT PERIODS		
AM	700AM	100AM
NOON		
PM	400PM	700PM

AM PEAK HOUR 815 AM

NOON PEAK HOUR

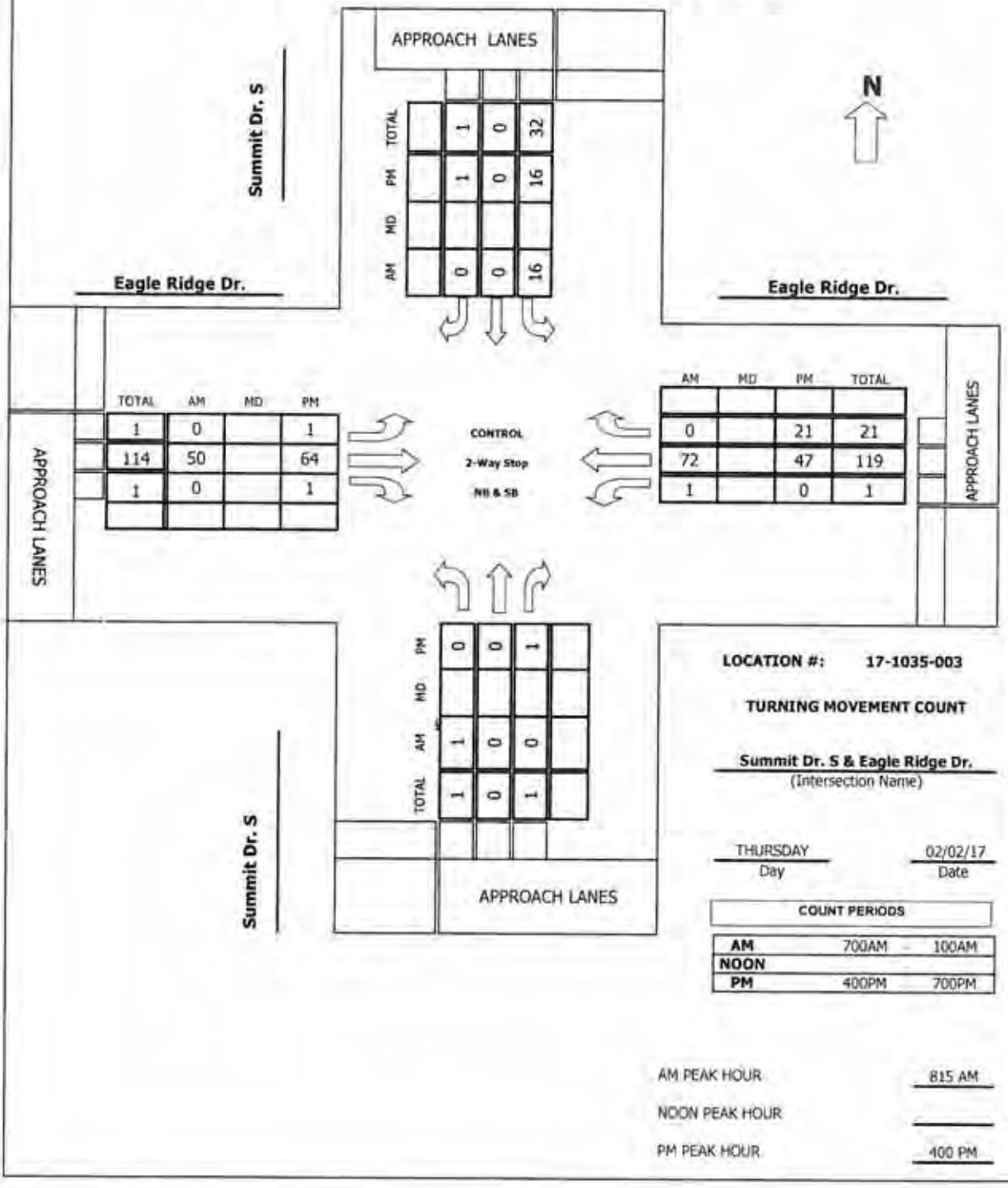
PM PEAK HOUR 415 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 17-1035-003

TMC SUMMARY OF Summit Dr. S & Eagle Ridge Dr.



LOCATION #: 17-1035-003

TURNING MOVEMENT COUNT

Summit Dr. S & Eagle Ridge Dr.
(Intersection Name)

THURSDAY (Day) 02/02/17 (Date)

COUNT PERIODS		
AM	700AM –	100AM
NOON		
PM	400PM –	700PM

AM PEAK HOUR 815 AM

NOON PEAK HOUR

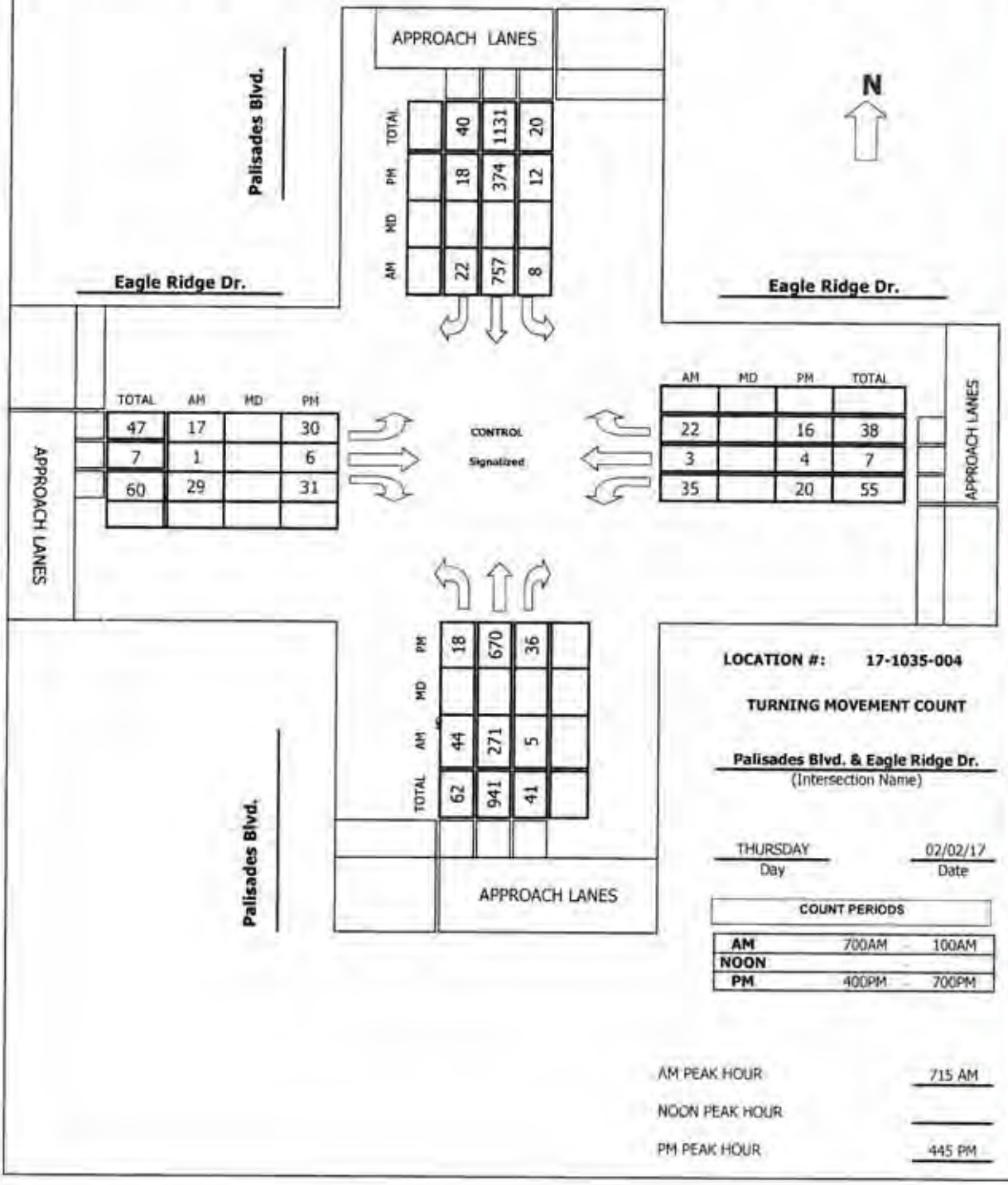
PM PEAK HOUR 400 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 17-1035-004

TMC SUMMARY OF Palisades Blvd. & Eagle Ridge Dr.



LOCATION #: 17-1035-004

TURNING MOVEMENT COUNT

Palisades Blvd. & Eagle Ridge Dr.
(Intersection Name)

THURSDAY (Day) 02/02/17 (Date)

COUNT PERIODS		
AM	700AM	100AM
NOON		
PM	400PM	700PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

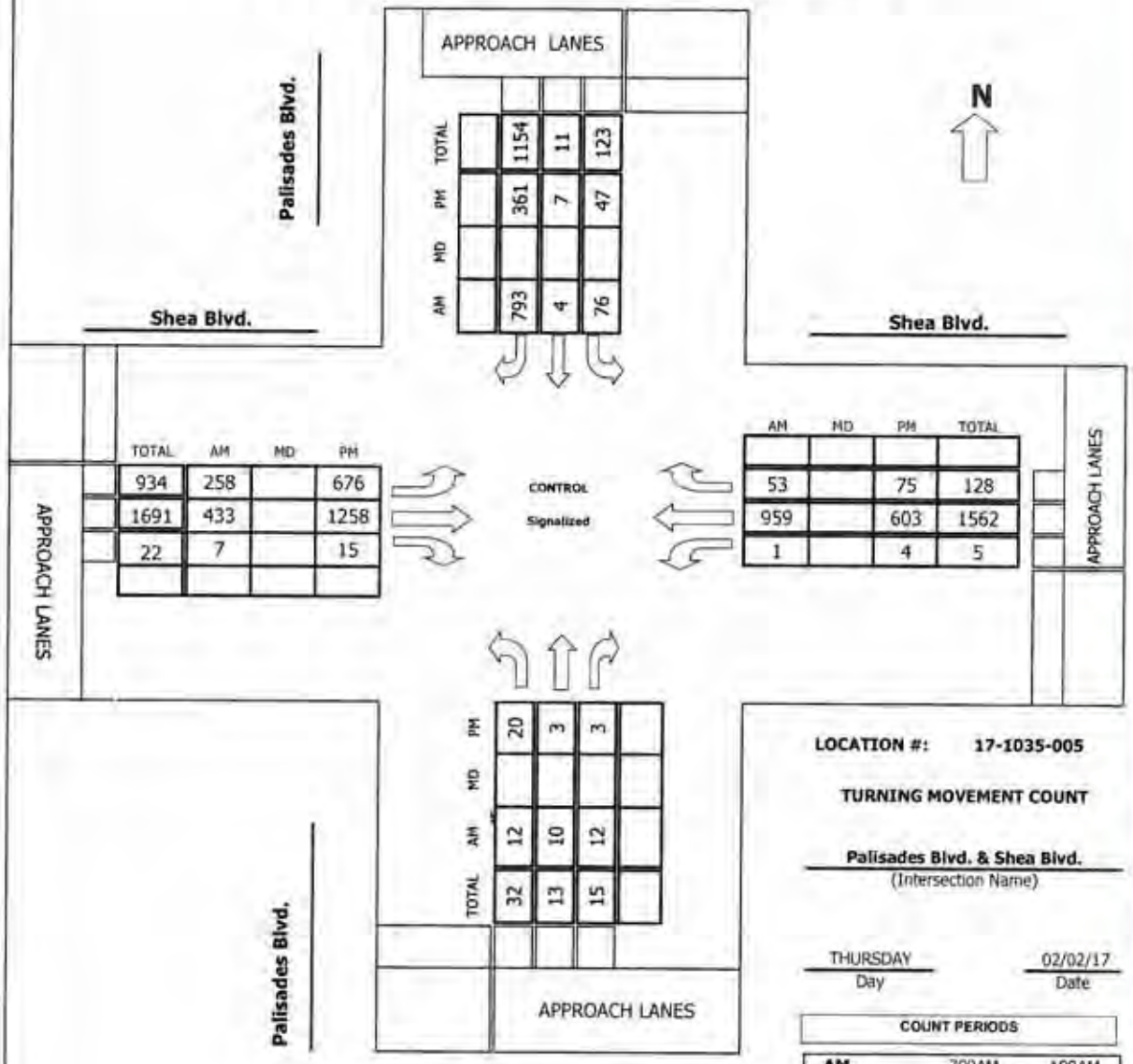
PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 17-1035-005

TMC SUMMARY OF Palisades Blvd. & Shea Blvd.



LOCATION #: 17-1035-005

TURNING MOVEMENT COUNT

Palisades Blvd. & Shea Blvd.
(Intersection Name)

THURSDAY (Day) 02/02/17 (Date)

COUNT PERIODS		
AM	700AM	100AM
NOON		
PM	400PM	700PM

AM PEAK HOUR 700 AM

NOON PEAK HOUR

PM PEAK HOUR 430 PM

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 — veracitytrafficgroup

N-S STREET: Eagle Ridge Dr. DATE: 02/02/17 LOCATION: Fountain Hills

E-W STREET: Copperwind Dr. DAY: THURSDAY PROJECT# 17-1035-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 0	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	17	1	0	7	0	0	0	0	0	0	0	25
7:15 AM	0	9	0	0	7	0	0	0	0	0	0	0	16
7:30 AM	0	8	1	0	3	0	0	0	0	1	0	0	12
7:45 AM	0	14	4	1	8	0	0	0	0	1	0	2	30
8:00 AM	0	22	3	1	5	0	0	0	0	4	0	1	36
8:15 AM	0	18	1	0	6	0	0	0	0	1	0	1	27
8:30 AM	0	15	0	1	7	0	0	0	0	1	0	0	24
8:45 AM	0	16	4	0	6	0	0	0	0	2	0	0	28
9:00 AM	0	14	1	1	16	0	0	0	0	2	0	0	34
9:15 AM	0	13	1	1	6	0	0	0	0	1	0	0	22
9:30 AM	0	11	4	0	5	0	0	0	0	3	0	0	23
9:45 AM	0	11	1	1	12	0	0	0	0	0	0	0	25
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	168	21	6	87	0	0	0	0	16	0	4	302
Approach %	0.00	88.89	11.11	6.45	93.55	0.00	####	####	####	80.00	0.00	20.00	
App/Depart	189	/	172	93	/	103	0	/	27	20	/	0	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	0	69	8	3	26	0	0	0	0	7	0	4	117
Approach %	0.00	89.61	10.39	10.34	89.66	0.00	####	####	####	63.64	0.00	36.36	
PEAK HR. FACTOR:	0.770			0.806			0.000			0.550			0.811

CONTROL: 1-Way Stop (WB)
COMMENT 1:
GPS: 33.603298, -111.762360
HOURS:

	FROM:		TO:	
AM	700	AM	130	AM
NOON				
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 — veracitytrafficgroup

N-S STREET: Eagle Ridge Dr. DATE: 02/02/17 LOCATION: Fountain Hills

E-W STREET: Copperwind Dr. DAY: THURSDAY PROJECT# 17-1035-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 0	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	4	2	1	8	0	0	0	0	3	0	1	20
4:15 PM	0	6	3	0	9	0	0	0	0	3	3	0	25
4:30 PM	0	9	3	0	15	0	0	0	0	5	0	3	35
4:45 PM	0	10	1	0	9	0	0	0	0	0	0	1	23
5:00 PM	0	8	1	0	10	0	0	0	0	2	0	0	21
5:15 PM	0	2	2	1	5	0	0	0	0	1	0	0	13
5:30 PM	0	5	4	1	9	0	0	0	0	7	0	2	28
5:45 PM	0	10	3	2	13	0	0	0	0	2	0	2	32
6:00 PM	0	8	2	1	8	0	0	0	0	4	0	0	23
6:15 PM	0	0	0	0	9	0	0	0	0	1	0	1	24
6:30 PM	0	6	3	0	11	0	0	0	0	3	0	1	22
6:45 PM	0	5	2	0	7	0	0	0	0	2	0	2	18

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	84	30	6	114	0	0	0	0	35	0	15	284
Approach %	0.00	73.68	26.32	5.00	95.00	0.00	####	####	####	70.00	0.00	30.00	
App/Depart	114	/	99	120	/	149	0	/	36	50	/	0	

PM Peak Hr Begins at: 530 PM

PEAK													
Volumes	0	32	13	4	39	0	0	0	0	12	0	7	107
Approach %	0.00	71.11	28.89	9.30	90.70	0.00	####	####	####	63.16	0.00	36.84	
PEAK HR. FACTOR:	0.865			0.717			0.000			0.529			0.836

CONTROL: 1-Way Stop (WB)
COMMENT 1:
GPS: 33.603298, -111.762360
HOURS:

	FROM:		TO:	
AM	700	AM	130	AM
NOON	0	0	0	0
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Eagle Ridge Dr DATE: 02/02/17 LOCATION: Fountain Hills

E-W STREET: Cloud Crest Tr/Summit Dr N DAY: THURSDAY PROJECT# 17-1035-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	17	0	0	5	1	0	0	0	0	0	2	26
7:15 AM	1	12	0	0	8	0	2	0	0	0	0	2	25
7:30 AM	0	10	0	0	3	0	1	0	0	0	0	1	15
7:45 AM	1	15	1	1	10	0	0	0	1	0	0	1	30
8:00 AM	0	25	0	0	7	0	1	0	0	0	0	0	33
8:15 AM	2	19	0	0	8	0	1	0	0	0	1	2	33
8:30 AM	1	14	0	0	6	0	1	0	0	1	0	0	25
8:45 AM	0	21	1	0	7	0	1	0	0	0	0	0	30
9:00 AM	1	16	0	1	18	0	0	0	0	0	0	2	39
9:15 AM	0	12	0	0	5	0	1	0	0	0	0	1	20
9:30 AM	0	15	0	0	8	1	1	0	0	0	0	1	26
9:45 AM	1	13	1	0	13	0	1	0	0	0	0	3	34
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	7	189	5	2	101	2	12	0	1	1	1	15	336
Approach %	3.48	94.03	2.49	1.90	96.19	1.90	92.31	0.00	7.69	5.88	5.88	88.24	
App/Depart	201	/	216	105	/	103	13	/	7	17	/	10	

AM Peak Hr Begins at: 815 AM

PEAK													
Volumes	4	70	1	1	40	0	5	0	0	1	1	4	127
Approach %	5.33	93.33	1.33	2.44	97.56	0.00	100.00	0.00	0.00	16.67	16.67	66.67	
PEAK HR. FACTOR:	0.852			0.513			0.417			0.500			0.814

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1:
GPS: 33.599460, -111.761067
HOURS:

	FROM:		TO:	
AM	700	AM	930	AM
NOON				
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Eagle Ridge Dr DATE: 02/02/17 LOCATION: Fountain Hills

E-W STREET: Cloud Crest Tr/Summit Dr N DAY: THURSDAY PROJECT# 17-1035-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	9	1	0	11	0	0	0	0	0	0	0	22
4:15 PM	2	10	0	0	15	2	0	0	0	0	0	0	29
4:30 PM	1	11	0	0	20	0	1	0	0	0	0	0	33
4:45 PM	0	13	0	0	6	0	1	0	0	0	0	1	21
5:00 PM	0	12	1	0	12	0	1	0	0	0	0	2	28
5:15 PM	2	9	1	1	6	0	2	0	1	0	0	0	19
5:30 PM	0	9	1	1	21	0	0	0	0	0	0	0	31
5:45 PM	0	17	1	0	12	0	0	0	1	0	0	1	32
6:00 PM	0	9	3	1	9	0	1	0	0	0	0	0	21
6:15 PM	1	12	0	0	9	0	0	0	0	0	0	0	22
6:30 PM	0	7	0	1	12	0	0	0	1	0	0	0	21
6:45 PM	0	9	1	2	6	0	0	0	0	0	0	1	17

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	7	119	9	6	139	2	6	0	3	0	0	5	296
Approach %	5.19	88.15	6.67	4.08	94.56	1.36	66.67	0.00	33.33	0.00	0.00	100.00	
App/Depart	135	/	130	147	/	142	9	/	15	5	/	0	

PM Peak Hr Begins at: 415 PM

PEAK													
Volumes	3	46	1	0	53	2	3	0	0	0	0	3	111
Approach %	6.00	92.00	2.00	0.00	96.36	3.64	100.00	0.00	0.00	0.00	0.00	100.00	
PEAK HR. FACTOR:	0.563			0.688			0.750			0.375			0.841

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1: 0
GPS: 33.599460, -111.761067
HOURS:

	FROM:		TO:	
AM	700	AM	930	AM
NOON	0	0	0	0
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Summit Dr. S | DATE: 02/02/17 | LOCATION: Fountain Hills

E-W STREET: Eagle Ridge Dr. | DAY: THURSDAY | PROJECT#: 17-1035-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	1	0	0	0	9	0	0	9	0	19
7:15 AM	0	0	1	4	0	0	0	10	0	0	11	2	28
7:30 AM	0	0	0	0	0	0	0	4	0	0	9	0	13
7:45 AM	0	0	0	0	0	0	0	12	0	0	20	0	32
8:00 AM	0	0	0	3	0	0	0	10	0	0	24	0	37
8:15 AM	0	0	0	3	0	0	0	9	0	0	21	0	33
8:30 AM	0	0	0	6	0	0	0	11	0	0	15	0	32
8:45 AM	0	0	0	5	0	0	0	11	0	0	22	0	38
9:00 AM	1	0	0	2	0	0	0	19	0	1	14	0	37
9:15 AM	0	0	1	0	0	0	0	8	0	0	14	0	23
9:30 AM	0	0	0	5	0	0	0	10	0	0	12	0	27
9:45 AM	0	0	1	3	0	0	0	7	0	0	16	1	28
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	1	0	3	30	0	0	0	120	0	1	189	3	347
Approach %	25.00	0.00	75.00	100.00	0.00	0.00	0.00	100.00	0.00	0.52	97.93	1.55	
App/Depart	4	/	3	30	/	1	120	/	153	193	/	190	

AM Peak Hr Begins at: 815 AM

PEAK													
Volumes	1	0	0	16	0	0	0	50	0	1	72	0	140
Approach %	100.00	0.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	1.37	98.63	0.00	
PEAK HR. FACTOR:	0.250			0.667			0.658			0.830			0.921

CONTROL: 2-Way Stop (NB & SB)
COMMENT 1:
GPS: 33.595324, -111.758197
HOURS:

	FROM:		TO:	
AM	700	AM	100	AM
NOON				
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Summit Dr. S | DATE: 02/02/17 | LOCATION: Fountain Hills

E-W STREET: Eagle Ridge Dr. | DAY: THURSDAY | PROJECT#: 17-1035-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	1	6	0	0	0	19	1	0	11	3	41
4:15 PM	0	0	0	1	0	1	0	13	0	0	13	10	36
4:30 PM	0	0	0	5	0	0	1	12	0	0	12	6	46
4:45 PM	0	0	0	4	0	0	0	10	0	0	12	3	29
5:00 PM	0	0	0	1	0	0	0	10	0	0	4	1	20
5:15 PM	0	0	0	0	0	0	0	24	0	0	6	4	34
5:30 PM	0	0	0	3	0	0	0	11	0	0	13	6	33
5:45 PM	0	0	0	0	0	0	0	6	0	0	10	0	16
6:00 PM	0	0	1	4	0	0	0	7	0	2	14	1	27
6:15 PM	0	0	0	1	0	0	1	5	0	0	10	4	21
6:30 PM	0	0	0	0	0	0	0	6	0	0	5	2	13
6:45 PM	0	0	0	0	0	0	0	3	0	1	4	2	10

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	2	25	0	1	2	136	1	3	113	43	326
Approach %	0.00	0.00	100.00	96.15	0.00	3.85	1.44	97.84	0.72	1.89	71.07	27.04	
App/Depart	2	/	45	26	/	4	139	/	163	159	/	114	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	0	0	1	16	0	1	1	64	1	0	47	21	152
Approach %	0.00	0.00	100.00	94.12	0.00	5.88	1.52	96.97	1.52	0.00	69.12	30.88	
PEAK HR. FACTOR:	0.250			0.709			0.717			0.810			0.826

CONTROL: 2-Way Stop (NB & SB)
COMMENT 1: 0
GPS: 33.595324, -111.758197
HOURS:

	FROM:		TO:	
AM	700	AM	100	AM
NOON	0	0	0	0
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Palisades Blvd | DATE: 02/02/17 | LOCATION: Fountain Hills

E-W STREET: Eagle Ridge Dr | DAY: THURSDAY | PROJECT#: 17-0135-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 2	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	15	54	2	1	183	5	4	0	5	11	0	3	283
7:15 AM	8	54	0	3	226	3	6	0	9	12	1	11	333
7:30 AM	7	56	2	3	193	3	1	0	3	9	0	2	279
7:45 AM	17	89	1	1	172	5	3	0	10	10	0	5	313
8:00 AM	12	72	2	3	168	13	3	1	7	4	2	8	289
8:15 AM	12	78	2	4	150	9	8	0	5	12	1	5	286
8:30 AM	8	81	6	3	146	5	6	0	11	9	2	2	279
8:45 AM	16	68	3	2	116	6	7	1	8	10	0	7	244
9:00 AM	8	65	3	2	128	9	10	2	10	8	1	2	248
9:15 AM	12	71	5	3	117	2	8	2	3	1	1	3	224
9:30 AM	10	75	2	1	136	5	2	0	10	6	0	1	248
9:45 AM	10	95	4	0	122	5	10	0	12	8	1	7	272
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	135	858	32	24	1855	68	68	6	93	98	9	52	3298
Approach %	13.17	83.71	3.12	1.23	95.27	3.49	40.72	3.59	55.69	61.64	5.66	32.70	
App/Depart	1025	/	978	1947	/	2046	167	/	62	159	/	212	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	44	271	5	8	757	22	17	1	29	35	3	22	1214
Approach %	13.75	84.69	1.56	1.02	96.19	2.80	36.17	2.13	61.70	58.33	5.00	36.67	
PEAK HR. FACTOR:	0.748			0.948			0.783			0.625			0.911

CONTROL: Signalized
COMMENT 1:
GPS: 33.595831, -111.756911
HOURS:

	FROM:		TO:	
AM	700	AM	100	AM
NOON				
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Palisades Blvd | DATE: 02/02/17 | LOCATION: Fountain Hills

E-W STREET: Eagle Ridge Dr | DAY: THURSDAY | PROJECT#: 17-0135-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	9	190	12	1	85	1	5	4	9	3	0	5	291
4:15 PM	6	162	12	1	88	11	9	3	8	4	1	3	305
4:30 PM	9	159	9	1	82	9	4	5	18	7	1	5	309
4:45 PM	1	166	9	2	92	5	6	3	9	4	0	5	295
5:00 PM	6	154	10	4	111	4	5	0	8	5	2	1	310
5:15 PM	4	169	11	4	82	5	8	2	6	8	4	6	309
5:30 PM	7	176	6	2	99	4	11	3	9	3	0	2	321
5:45 PM	11	155	10	1	86	5	5	0	10	6	1	3	285
6:00 PM	5	98	9	3	76	12	6	0	10	0	2	3	232
6:15 PM	6	141	5	1	83	4	1	1	7	5	2	3	261
6:30 PM	3	132	0	1	65	4	2	1	10	3	0	1	229
6:45 PM	3	122	4	2	50	0	1	2	9	4	0	2	204

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	81	1803	104	27	963	70	57	20	112	61	13	40	3351
Approach %	4.07	90.69	5.23	2.55	90.85	6.60	30.16	10.58	59.26	53.51	11.40	35.09	
App/Depart	1988	/	1900	1060	/	1136	189	/	151	114	/	164	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	18	670	36	12	374	18	30	6	31	20	4	16	1235
Approach %	2.49	92.54	4.97	2.97	92.57	4.46	44.78	8.96	46.27	50.00	10.00	40.00	
PEAK HR. FACTOR:	0.948			0.849			0.838			0.556			0.962

CONTROL: Signalized
COMMENT 1: 0
GPS: 33.595831, -111.756911
HOURS:

	FROM:		TO:	
AM	700	AM	100	AM
NOON	0	0	0	0
PM	400	PM	700	PM

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 — veracitytrafficgroup

N-S STREET: Palisades Blvd DATE: 02/02/17 LOCATION: Fountain Hills

E-W STREET: Shea Blvd. DAY: THURSDAY PROJECT# 17-1035-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 1	ST 1	SR 2	EL 2	ET 3	ER 1	WL 1	WT 3	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	6	2	0	22	1	208	56	87	1	0	224	10	618
7:15 AM	1	6	6	15	3	234	48	103	2	0	271	10	699
7:30 AM	2	0	2	15	0	187	85	125	2	1	258	17	694
7:45 AM	3	2	4	24	0	164	69	118	1	0	206	16	607
8:00 AM	7	2	4	14	0	162	69	108	3	0	151	14	573
8:15 AM	1	1	1	10	0	170	77	119	0	2	167	18	568
8:30 AM	6	0	0	15	1	147	69	126	2	1	162	13	542
8:45 AM	4	0	3	15	0	117	77	125	1	0	127	18	497
9:00 AM	2	2	3	13	1	138	59	115	1	1	131	14	482
9:15 AM	1	2	9	15	2	130	72	140	1	2	158	16	549
9:30 AM	1	2	1	18	3	130	87	137	2	5	145	14	547
9:45 AM	3	5	2	10	1	137	76	133	4	1	144	12	525
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	38	22	39	184	12	1924	844	1436	22	14	2194	172	6901
Approach %	38.38	22.22	39.39	8.68	0.57	90.75	36.66	62.38	0.96	0.59	92.18	7.23	
App/Depart	99	/	1038	2120	/	48	2302	/	1659	2380	/	4156	

AM Peak Hr Begins at: 700 AM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	12	10	12	76	4	793	258	433	7	1	959	53	2618
Approach %	35.29	29.41	35.29	8.71	0.46	90.84	36.96	62.03	1.00	0.10	94.67	5.23	

PEAK HR. FACTOR: | 0.654 | 0.870 | 0.823 | 0.901 | 0.936 |

CONTROL: Signalized

COMMENT 1:

GPS: 33.585524, -111.756824

HOURS:

	FROM:		TO:	
AM	[illegible]	[illegible]	[illegible]	[illegible]
NOON				
PM	[illegible]	[illegible]	[illegible]	[illegible]

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 — veracitytrafficgroup

N-S STREET: Palisades Blvd DATE: 02/02/17 LOCATION: Fountain Hills

E-W STREET: Shea Blvd DAY: THURSDAY PROJECT# 17-1035-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 1	ST 1	SR 2	EL 2	ET 3	ER 1	WL 1	WT 3	WR 1	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	2	0	1	11	2	110	163	290	7	3	151	15	740
4:15 PM	2	1	5	13	0	91	162	278	5	3	132	16	708
4:30 PM	4	1	1	18	2	96	176	335	8	1	175	14	820
4:45 PM	0	1	1	10	3	91	151	282	8	1	143	12	703
5:00 PM	6	1	1	11	2	112	181	310	1	0	137	27	789
5:15 PM	10	0	0	10	0	72	188	327	1	2	148	22	760
5:30 PM	4	1	3	15	2	95	161	249	1	3	133	23	712
5:45 PM	4	3	0	13	1	69	136	213	4	1	128	22	590
6:00 PM	3	0	2	11	1	99	143	165	2	4	99	8	535
6:15 PM	2	0	0	8	3	72	140	151	6	2	99	9	490
6:30 PM	2	2	2	11	1	48	114	135	4	0	95	13	428
6:45 PM	1	0	0	4	3	48	108	132	4	1	78	7	385

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	40	8	16	132	21	994	1823	2871	50	21	1498	186	7660
Approach %	62.50	12.50	25.00	11.51	1.83	86.66	38.43	60.52	1.05	1.23	87.86	10.91	
App/Depart	64	/	2017	1147	/	92	4744	/	3019	1705	/	2532	

PM Peak Hr Begins at: 430 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	20	3	3	47	7	361	676	1258	15	4	603	75	3072
Approach %	76.92	11.54	11.54	11.33	1.69	86.99	34.68	64.55	0.77	0.59	88.42	11.00	

PEAK HR. FACTOR: | 0.650 | 0.830 | 0.937 | 0.897 | 0.937 |

CONTROL: Signalized

COMMENT 1: 0

GPS: 33.585524, -111.756824

HOURS:

	FROM:		TO:	
AM	[illegible]	[illegible]	[illegible]	[illegible]
NOON	[illegible]	[illegible]	[illegible]	[illegible]
PM	[illegible]	[illegible]	[illegible]	[illegible]

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: Eagle Ridge Dr.
E-W STREET: Copperwynd Dr.

Date: 02/02/17
Day: THURSDAY

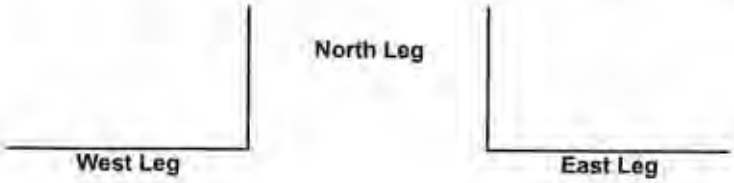
City: Fountain Hi
Project #: 17-1035-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	1	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	1	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	1	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	2	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	1	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	2	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	1	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	0	0



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: Eagle Ridge Dr.
E-W STREET: Cloud Crest Tr/Summit Dr N

Date: 02/02/17
Day: THURSDAY

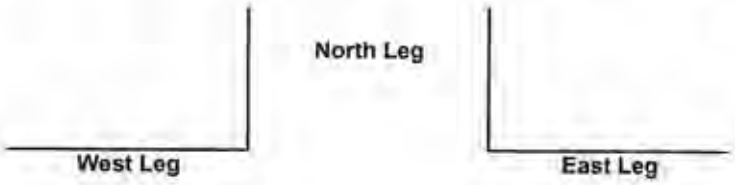
City: Fountain Hi
Project #: 17-1035-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	1	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	1	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	0	0



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: Summit Dr. S
E-W STREET: Eagle Ridge Dr.

Date: 02/02/17
Day: THURSDAY

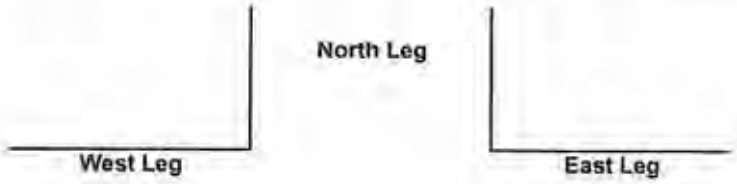
City: Fountain Hi
Project #: 17-1035-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	1	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	1	0	0	2
4:45 PM	0	1	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	1	1	0	2

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	0	0



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: Palisades Blvd.
E-W STREET: Eagle Ridge Dr.

Date: 02/02/17
Day: THURSDAY

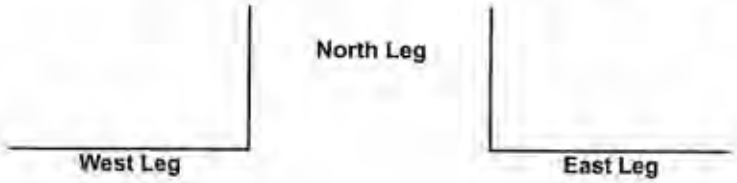
City: Fountain Hi
Project #: 17-1035-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	2	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	1	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	1	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	1	0	2	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	1	0	1	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	1	0	1	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	1	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	1	0



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: Palisades Blvd.
E-W STREET: Shea Blvd.

Date: 02/02/17
Day: THURSDAY

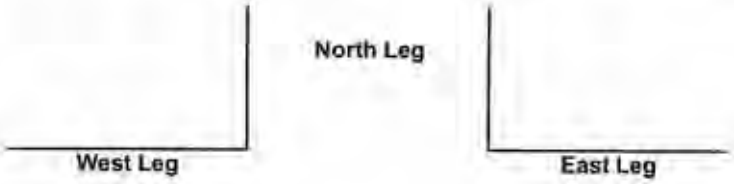
City: Fountain Hi
Project #: 17-1035-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	1	0	0
9:45 AM	0	0	0	0
TOTAL	0	1	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
TOTAL	0	0	0	0



Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Thursday, February 02, 2017 City: Fountain Hills Project #: 17-1035-006

Location: Copperwynd Driveway east of Eagle Ridge Dr.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			1		3			12:00			11		11		
00:15			0		2			12:15			7		13		
00:30			0		0			12:30			9		9		
00:45			0	1	1	6	7	12:45			10	37	8	41	78
01:00			0		0			13:00			12		12		
01:15			0		0			13:15			7		10		
01:30			0		0			13:30			5		8		
01:45			0	0	0	0		13:45			8	32	10	40	72
02:00			0		0			14:00			10		8		
02:15			0		0			14:15			4		8		
02:30			0		0			14:30			6		11		
02:45			1	1	1	1	2	14:45			5	25	14	41	66
03:00			0		0			15:00			4		8		
03:15			0		0			15:15			8		10		
03:30			0		0			15:30			8		11		
03:45			1	1	1	1	2	15:45			7	27	12	41	68
04:00			0		0			16:00			6		9		
04:15			1		0			16:15			6		11		
04:30			2		2			16:30			12		13		
04:45			0	3	0	2	5	16:45			10	34	9	42	76
05:00			1		1			17:00			10		8		
05:15			4		1			17:15			4		8		
05:30			2		2			17:30			6		8		
05:45			6	13	2	6	19	17:45			11	31	13	37	68
06:00			5		4			18:00			8		10		
06:15			8		6			18:15			12		9		
06:30			3		3			18:30			8		7		
06:45			7	23	5	18	41	18:45			13	41	8	34	75
07:00			12		6			19:00			14		9		
07:15			8		5			19:15			6		7		
07:30			7		2			19:30			5		5		
07:45			13	40	7	20	60	19:45			3	28	8	29	57
08:00			15		5			20:00			6		6		
08:15			16		5			20:15			3		11		
08:30			13		6			20:30			5		9		
08:45			15	59	6	22	81	20:45			4	18	7	33	51
09:00			14		13			21:00			7		3		
09:15			13		7			21:15			6		6		
09:30			11		5			21:30			3		4		
09:45			11	49	13	38	87	21:45			6	22	6	19	41
10:00			6		13			22:00			3		3		
10:15			9		15			22:15			0		2		
10:30			6		10			22:30			2		1		
10:45			6	27	8	46	73	22:45			0	5	0	6	11
11:00			11		15			23:00			1		2		
11:15			7		6			23:15			0		0		
11:30			10		11			23:30			1		0		
11:45			8	36	8	40	76	23:45			0	2	2	4	6
Total Vol.				253		200	**453**					302		367	**669**

GPS Coordinates:

Daily Totals

NB	SB	EB	WB	Combined
		555	567	**1122**

	AM			PM		
Split %	55.8%	44.2%	**40.4%**	45.1%	54.9%	**59.6%**
Peak Hour	08:00	09:45	**08:15**	18:15	15:45	**12:15**
Volume	59	51	**88**	47	45	**80**
P.H.F.	0.92	0.85	**0.81**	0.84	0.87	**0.83**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Thursday, February 02, 2017 City: Fountain Hills Project #: 17-1035-007

Location: Copperwynd Driveway north of Copperwynd Dr.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	2		3				
00:15	0		0					12:15	2		2				
00:30	0		0					12:30	2		1				
00:45	0	0	0	0				12:45	0	6	0	6			12
01:00	0		0					13:00	1		1				
01:15	0		0					13:15	1		1				
01:30	0		0					13:30	1		0				
01:45	0	0	0	0				13:45	0	3	0	2			5
02:00	0		0					14:00	5		5				
02:15	0		0					14:15	2		1				
02:30	0		0					14:30	0		1				
02:45	0	0	0	0				14:45	1	8	1	8			16
03:00	0		0					15:00	0		2				
03:15	0		0					15:15	2		1				
03:30	0		0					15:30	2		4				
03:45	0	0	0	0				15:45	0	4	2	9			13
04:00	0		0					16:00	1		3				
04:15	0		0					16:15	1		7				
04:30	0		0					16:30	3		4				
04:45	0	0	0	0				16:45	0	5	0	14			19
05:00	0		0					17:00	0		0				
05:15	0		0					17:15	0		0				
05:30	0		0					17:30	2		7				
05:45	0	0	0	0				17:45	4	6	3	10			16
06:00	0		0					18:00	1		1				
06:15	0		0					18:15	0		0				
06:30	1		0					18:30	0		0				
06:45	2	3	0	0			3	18:45	0	1	1	2			3
07:00	1		0					19:00	0		1				
07:15	0		0					19:15	0		1				
07:30	1		0					19:30	0		0				
07:45	3	5	0	0			5	19:45	0	0	0	2			2
08:00	3		1					20:00	0		0				
08:15	1		0					20:15	0		0				
08:30	0		0					20:30	0		0				
08:45	4	8	0	1			9	20:45	0	0	0	0			
09:00	1		0					21:00	0		3				
09:15	2		0					21:15	0		0				
09:30	2		0					21:30	0		0				
09:45	1	6	0	0			6	21:45	0	0	0	3			3
10:00	0		0					22:00	0		2				
10:15	1		0					22:15	0		1				
10:30	1		1					22:30	0		1				
10:45	0	2	1	2			4	22:45	0	0	0	4			4
11:00	3		2					23:00	2		2				
11:15	3		0					23:15	0		0				
11:30	0		0					23:30	0		0				
11:45	0	6	0	2			8	23:45	0	2	0	2			4
Total Vol.		30		5			**35**			35		62			**97**

GPS Coordinates:

Daily Totals

NB	SB	EB	WB	Combined
65	67			**132**

	AM			PM		
Split %	85.7%	14.3%	**26.5%**	36.1%	63.9%	**73.5%**
Peak Hour	08:45	11:45	**11:45**	13:30	15:30	**15:45**
Volume	9	6	**12**	8	16	**21**
P.H.F.	0.56	0.50	**0.60**	0.40	0.57	**0.66**

APPENDIX C

EXISTING PEAK HOUR CAPACITY ANALYSIS

CivTech

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	7	4	69	8	3	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	77	9	3	29

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	117	81	0	0	86	0
Stage 1	81	-	-	-	-	-
Stage 2	36	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	879	979	-	-	1510	-
Stage 1	942	-	-	-	-	-
Stage 2	986	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	877	979	-	-	1510	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	984	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	912	1510	-
HCM Lane V/C Ratio	-	-	0.013	0.002	-
HCM Control Delay (s)	-	-	9	7.4	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	0	0	1	1	4	4	70	1	1	40	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	0	1	1	4	4	78	1	1	44	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	137	135	44	134	134	78	44	0	0	79	0	0
Stage 1	47	47	-	87	87	-	-	-	-	-	-	-
Stage 2	90	88	-	47	47	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	834	756	1026	838	757	983	1564	-	-	1519	-	-
Stage 1	967	856	-	921	823	-	-	-	-	-	-	-
Stage 2	917	822	-	967	856	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	827	754	1026	836	755	983	1564	-	-	1519	-	-
Mov Cap-2 Maneuver	827	754	-	836	755	-	-	-	-	-	-	-
Stage 1	965	855	-	919	821	-	-	-	-	-	-	-
Stage 2	909	820	-	966	855	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9	0.4	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1564	-	-	827	910	1519	-	-
HCM Lane V/C Ratio	0.003	-	-	0.007	0.007	0.001	-	-
HCM Control Delay (s)	7.3	-	-	9.4	9	7.4	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South 2/15/2017

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	50	0	1	72	0	1	0	0	16	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	56	0	1	80	0	1	0	0	18	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	80	0	0	56	0	0	138	138	56	138	138	80
Stage 1	-	-	-	-	-	-	56	56	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	56	56	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1518	-	-	1549	-	-	833	753	1011	833	753	980
Stage 1	-	-	-	-	-	-	956	848	-	926	827	-
Stage 2	-	-	-	-	-	-	926	827	-	956	848	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1518	-	-	1549	-	-	832	752	1011	832	752	980
Mov Cap-2 Maneuver	-	-	-	-	-	-	832	752	-	832	752	-
Stage 1	-	-	-	-	-	-	956	848	-	926	826	-
Stage 2	-	-	-	-	-	-	925	826	-	956	848	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	9.3	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	832	1518	-	-	1549	-	-	832
HCM Lane V/C Ratio	0.001	-	-	-	0.001	-	-	0.021
HCM Control Delay (s)	9.3	0	-	-	7.3	0	-	9.4
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd 2/15/2017

Intersection	
Intersection Delay, s/veh	26.5
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	17	1	29	0	35	3	22	0	44	271	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	19	1	32	0	39	3	24	0	49	301	6
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	10.9	11.3	13.2
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	33%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	67%	100%	0%	0%	3%	0%	12%	0%	100%	92%
Vol Right, %	0%	0%	100%	0%	97%	0%	88%	0%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	134	181	5	17	30	35	25	8	505	274
LT Vol	44	0	0	17	0	35	0	8	0	0
Through Vol	90	181	0	0	1	0	3	0	505	252
RT Vol	0	0	5	0	29	0	22	0	0	22
Lane Flow Rate	149	201	6	19	33	39	28	9	561	305
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.29	0.38	0.009	0.044	0.067	0.09	0.056	0.016	0.928	0.5
Departure Headway (Hd)	6.987	6.822	6.117	8.414	7.23	8.354	7.232	6.461	5.958	5.902
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	513	526	583	424	493	427	493	553	606	610
Service Time	4.749	4.584	3.878	6.197	5.013	6.134	5.012	4.208	3.704	3.648
HCM Lane V/C Ratio	0.29	0.382	0.01	0.045	0.067	0.091	0.057	0.016	0.926	0.5
HCM Control Delay	12.6	13.7	8.9	11.6	10.5	12	10.4	9.3	45.1	14.4
HCM Lane LOS	B	B	A	B	B	B	B	A	E	B
HCM 95th-tile Q	1.2	1.8	0	0.1	0.2	0.3	0.2	0	12	2.8

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd 2/15/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	757	22
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	841	24
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	34
HCM LOS	D

Lane

HCM 2010 Signalized Intersection Summary
5: Shea Blvd & Palisades Blvd 2/15/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	258	433	7	1	959	53	12	10	12	76	4	793
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	287	481	8	1	1066	59	13	11	13	84	4	881
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	372	2128	662	2	1584	564	22	279	330	641	727	1389
Arrive On Green	0.11	0.42	0.42	0.00	0.31	0.31	0.01	0.36	0.36	0.04	0.39	0.39
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	779	921	1774	1863	2787
Grp Volume(v), veh/h	287	481	8	1	1066	59	13	0	24	84	4	881
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1700	1774	1863	1393
Q Serve(g_s), s	7.3	5.5	0.3	0.1	16.4	2.2	0.7	0.0	0.8	2.6	0.1	20.9
Cycle Q Clear(g_c), s	7.3	5.5	0.3	0.1	16.4	2.2	0.7	0.0	0.8	2.6	0.1	20.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	372	2128	662	2	1584	564	22	0	609	641	727	1389
V/C Ratio(X)	0.77	0.23	0.01	0.51	0.67	0.10	0.59	0.00	0.04	0.13	0.01	0.63
Avail Cap(c_a), veh/h	535	2373	739	118	1921	669	118	0	609	641	727	1389
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	16.8	15.3	44.9	27.0	19.4	44.2	0.0	18.8	16.3	16.8	16.6
Incr Delay (d2), s/veh	4.3	0.1	0.0	128.6	0.7	0.1	23.1	0.0	0.1	0.1	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	2.5	0.1	0.1	7.8	1.0	0.5	0.0	0.4	1.3	0.1	8.4
LnGrp Delay(d),s/veh	43.3	16.9	15.3	173.5	27.7	19.5	67.3	0.0	18.9	16.4	16.8	18.8
LnGrp LOS	D	B	B	F	C	B	E		B	B	B	B
Approach Vol, veh/h		776			1126			37			969	
Approach Delay, s/veh		26.6			27.4			35.9			18.6	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	36.2	4.1	41.7	5.1	39.1	13.7	32.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	11.6	2.8	2.1	7.5	2.7	22.9	9.3	18.4
Green Ext Time (p_c), s	0.0	4.0	0.0	15.0	0.0	0.0	0.4	9.6

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	23	0	16	57	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	0	18	63	0	7

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	56	49	0	0	81	0
Stage 1	49	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	952	1020	-	-	1517	-
Stage 1	973	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	952	1020	-	-	1517	-
Mov Cap-2 Maneuver	952	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 952	1517	-
HCM Lane V/C Ratio	-	- 0.027	-	-
HCM Control Delay (s)	-	- 8.9	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	7	4	10	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	11	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	11	0	-	0	31	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	20	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1608	-	-	-	983	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1003	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1608	-	-	-	978	1070
Mov Cap-2 Maneuver	-	-	-	-	978	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	998	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1608	-	-	-	1070
HCM Lane V/C Ratio	0.005	-	-	-	0.001
HCM Control Delay (s)	7.2	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	12	7	32	13	4	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	8	36	14	4	43

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	95	43	0	0	50	0
Stage 1	43	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	905	1027	-	-	1557	-
Stage 1	979	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	903	1027	-	-	1557	-
Mov Cap-2 Maneuver	903	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	945	1557	-
HCM Lane V/C Ratio	-	-	0.022	0.003	-
HCM Control Delay (s)	-	-	8.9	7.3	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	0	0	0	0	3	3	46	1	0	53	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	0	0	0	3	3	51	1	0	59	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	120	119	60	118	119	52	61	0	0	52	0	0
Stage 1	60	60	-	58	58	-	-	-	-	-	-	-
Stage 2	60	59	-	60	61	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	855	771	1005	858	771	1016	1542	-	-	1554	-	-
Stage 1	951	845	-	954	847	-	-	-	-	-	-	-
Stage 2	951	846	-	951	844	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	851	770	1005	857	770	1016	1542	-	-	1554	-	-
Mov Cap-2 Maneuver	851	770	-	857	770	-	-	-	-	-	-	-
Stage 1	949	845	-	952	845	-	-	-	-	-	-	-
Stage 2	946	844	-	951	844	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	8.6	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1542	-	-	851	1016	1554	-	-
HCM Lane V/C Ratio	0.002	-	-	0.004	0.003	-	-	-
HCM Control Delay (s)	7.3	-	-	9.2	8.6	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South 2/15/2017

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	64	1	0	47	21	0	0	1	16	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	71	1	0	52	23	0	0	1	18	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	72	0	0	138	150	72	138	138	64
Stage 1	-	-	-	-	-	-	74	74	-	64	64	-
Stage 2	-	-	-	-	-	-	64	76	-	74	74	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1523	-	-	1528	-	-	833	742	990	833	753	1000
Stage 1	-	-	-	-	-	-	935	833	-	947	842	-
Stage 2	-	-	-	-	-	-	947	832	-	935	833	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1523	-	-	1528	-	-	832	742	990	832	753	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-	832	742	-	832	753	-
Stage 1	-	-	-	-	-	-	934	832	-	946	842	-
Stage 2	-	-	-	-	-	-	946	832	-	933	832	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	8.6	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	990	1523	-	-	1528	-	-	840
HCM Lane V/C Ratio	0.001	0.001	-	-	-	-	-	0.022
HCM Control Delay (s)	8.6	7.4	-	-	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd 2/15/2017

Intersection	
Intersection Delay, s/veh	21.3
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	30	6	31	0	20	4	16	0	18	670	36
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	33	7	34	0	22	4	18	0	20	744	40
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	11.3	11.2	26.3
HCM LOS	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	7%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	93%	100%	0%	0%	16%	0%	20%	0%	100%	87%
Vol Right, %	0%	0%	100%	0%	84%	0%	80%	0%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	241	447	36	30	37	20	20	12	249	143
LT Vol	18	0	0	30	0	20	0	12	0	0
Through Vol	223	447	0	0	6	0	4	0	249	125
RT Vol	0	0	36	0	31	0	16	0	0	18
Lane Flow Rate	268	496	40	33	41	22	22	13	277	159
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.461	0.848	0.061	0.078	0.084	0.053	0.046	0.027	0.518	0.293
Departure Headway (Hd)	6.191	6.154	5.449	8.442	7.348	8.551	7.483	7.239	6.735	6.646
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	579	586	654	422	485	417	475	493	535	539
Service Time	3.948	3.91	3.205	6.232	5.138	6.347	5.279	5.006	4.502	4.413
HCM Lane V/C Ratio	0.463	0.846	0.061	0.078	0.085	0.053	0.046	0.026	0.518	0.295
HCM Control Delay	14.2	34.2	8.6	12	10.8	11.8	10.6	10.2	16.6	12.2
HCM Lane LOS	B	D	A	B	B	B	B	B	C	B
HCM 95th-tile Q	2.4	9.1	0.2	0.3	0.3	0.2	0.1	0.1	3	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	12	374	18
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	13	416	20
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	14.9
HCM LOS	B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	676	1258	15	4	603	75	20	3	3	47	7	361
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	751	1398	17	4	670	83	22	3	3	52	8	401
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	820	2376	740	8	1185	420	33	273	273	581	618	1590
Arrive On Green	0.24	0.47	0.47	0.00	0.23	0.23	0.02	0.32	0.32	0.03	0.33	0.33
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	751	1398	17	4	670	83	22	0	6	52	8	401
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	19.1	18.2	0.5	0.2	10.5	3.7	1.1	0.0	0.2	1.8	0.3	6.5
Cycle Q Clear(g_c), s	19.1	18.2	0.5	0.2	10.5	3.7	1.1	0.0	0.2	1.8	0.3	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	820	2376	740	8	1185	420	33	0	545	581	618	1590
V/C Ratio(X)	0.92	0.59	0.02	0.53	0.57	0.20	0.66	0.00	0.01	0.09	0.01	0.25
Avail Cap(c_a), veh/h	841	2376	740	296	1808	614	79	0	545	603	618	1590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	17.6	12.9	44.7	30.5	25.6	43.9	0.0	21.0	19.5	20.2	9.7
Incr Delay (d2), s/veh	14.3	0.4	0.0	48.1	0.4	0.2	20.0	0.0	0.0	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	8.5	0.2	0.2	4.9	1.6	0.7	0.0	0.1	0.9	0.1	2.6
LnGrp Delay(d),s/veh	47.7	18.0	12.9	92.9	30.9	25.9	63.8	0.0	21.0	19.6	20.2	10.1
LnGrp LOS	D	B	B	F	C	C	E		C	B	C	B
Approach Vol, veh/h		2166			757			28			461	
Approach Delay, s/veh		28.3			30.7			54.7			11.3	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	32.7	4.4	46.0	5.7	33.9	25.5	25.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	3.0	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	3.8	2.2	2.2	20.2	3.1	8.5	21.1	12.5
Green Ext Time (p_c), s	0.0	1.4	0.0	14.0	0.0	1.1	0.3	8.5

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	40	0	2	37	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	0	2	41	0	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	26	23	0	0	43	0
Stage 1	23	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	989	1054	-	-	1566	-
Stage 1	1000	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	989	1054	-	-	1566	-
Mov Cap-2 Maneuver	989	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	989	1566	-
HCM Lane V/C Ratio	-	-	0.045	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	7	10	8	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	11	9	0	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	9	0	-	0	36	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1611	-	-	-	977	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1611	-	-	-	972	1073
Mov Cap-2 Maneuver	-	-	-	-	972	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1073
HCM Lane V/C Ratio	0.005	-	-	-	0.011
HCM Control Delay (s)	7.2	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

APPENDIX D

TRIP GENERATION

CivTech

Proposed Land Use Types and Size

Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
Hotel or motel	96	Rooms	310	Hotel

Notes: -Abbreviations: ITE = Institute of Transportation Engineers, LUC = land use code, SF = square feet, KSF = 1,000 square feet, DU = Dwelling Units, Keys = keyed guest units.
-ITE methodology per the *Trip Generation Handbook* is the basis for deciding which rate/equation to use. Exceptions are highlighted.

Base Trips

	ADT				AM				PM				(not used)
Proposed Use	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Hotel or motel	50%	428	428	856	58%	37	27	64	49%	35	36	71	
Totals		**428**	**428**	**856**		**37**	**27**	**64**		**35**	**36**	**71**	

Proposed Land Use Types and Size

Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
Hotel or motel	166	Rooms	310	Hotel

Notes: -Abbreviations: ITE = Institute of Transportation Engineers, LUC = land use code, SF = square feet, KSF = 1,000 square feet, DU = Dwelling Units, Keys = keyed guest units.
-ITE methodology per the *Trip Generation Handbook* is the basis for deciding which rate/equation to use. Exceptions are highlighted.

Base Trips

	ADT				AM				PM				(not used)
Proposed Use	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Hotel or motel	50%	740	740	1,480	58%	64	47	111	49%	60	63	123	
Totals		**740**	**740**	**1,480**		**64**	**47**	**111**		**60**	**63**	**123**	

Proposed Land Use Types and Size

Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
Hotel or motel	268	Rooms	310	Hotel

Notes: -Abbreviations: ITE = Institute of Transportation Engineers, LUC = land use code, SF = square feet, KSF = 1,000 square feet, DU = Dwelling Units, Keys = keyed guest units.
-ITE methodology per the *Trip Generation Handbook* is the basis for deciding which rate/equation to use. Exceptions are highlighted.

Base Trips

	ADT				AM				PM				
Proposed Use	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	(not used)
Hotel or motel	50%	1,195	1,195	2,390	58%	104	76	180	49%	97	101	198	
Totals		**1,195**	**1,195**	**2,390**		**104**	**76**	**180**		**97**	**101**	**198**	

APPENDIX F

SELECTED EXCERPTS FROM PALISADES BOULEVARD AND EAGLE RIDGE DRIVE INTERSECTION NEEDS ASSESSMENT

CivTech

CivTech

April 16, 2014

Mr. Jeremy Hall
Adero Canyon, LLC
13620 North Saguaro Boulevard, Suite 200
Fountain Hills, Arizona 85268

RE: Palisades Boulevard and Eagle Ridge Drive
Intersection Needs Assessment

Dear Mr. Hall:

The purposes of this assessment, which is presented in a format similar to that of a Technical Memorandum, are to address and document more formally the need for a traffic signal at the intersection of Palisades Boulevard and Eagle Ridge Drive now and in the future and to assess the need for a northbound left turn lane on Palisades Boulevard and south- and eastbound right turn lanes at the intersection. A vicinity map with aerial photograph is included as **Attachment 1**.

Briefly, the conclusions documented in this assessment are that a traffic signal is not currently warranted at the intersection of Palisades Boulevard and Eagle Ridge Drive; that a northbound left turn lane should be provided with any future installation of the traffic signal; that no other auxiliary turn lanes are warranted currently or in the future; that geometric conditions limiting sight lines warrant prohibition of right turns on red from the side streets and a protected left turn phase for Palisades Boulevard when a signal is installed; that, while a signal *could* be warranted when new development in Adero Canyon accessing Eagle Ridge Drive generates as few as 15% of its total expected trips, a level of service analysis revealed that the intersection could operate at an acceptable LOS C in both peak hours at least through 2030 as a four-way stop-controlled intersection; and that the additional 836 trips to be generated by Adero Canyon as now proposed will have little to no impact on the operation of Eagle Ridge Drive or on the recommended improvements to the intersection in either scope or timing.

Background and Purpose

A developer, Adero Canyon, LLC, is planning to begin developing its Adero Canyon residential subdivision that will be located in neighborhoods with access to Eagle Ridge Drive, which will be extended to the northwest from its current terminus at the entrance to the development. As part of the first phase of development, a public trailhead will be located just beyond the far northwest corner of the development. Thus, in addition to site traffic for Adero Canyon there is expected to be vehicular traffic generated by the Town of Fountain Hills for the trailhead.

The Adero Canyon property was previously known as Eagle Ridge North. Eagle Ridge North was a residential community planned with another community to the north, Eagle's Nest, on which development has begun. Originally shown as abutting and their roadway network's linked in a 1999 traffic study, by 2001 the two communities were separated and studied again. In the 2001 traffic report by Kimley-Horn and Associates, Eagle Ridge North was shown to provide 171 lots for single family detached dwelling units generating 1,698 trips daily, with 129 generated during the AM peak hour (32 in, 97 out) and 174 during the PM peak our (111 in, 63 out). The trailhead was also studied in 2001, with an estimated 239 trips daily, which CivTech, assuming there will be no overnight trips, will round to 240 trips, 120 in and 120 out. No hourly estimates for trailhead use were provided at that time.

Some changes have been proposed to the development that are currently in the approval process. An increase in density has been proposed to provide five more single family homes (a new total of 176) on smaller lots, 44 luxury condominiums/townhomes, and 120 resort hotel rooms which could be affiliated with the adjacent Copperwynd Resort.

CivTech updated a traffic study for the revised land use plan and issued a report dated January 16, 2014 that concluded that the Adero Canyon development would generate 2,534 trips daily, a net increase of 836 trips per day over those anticipated from Eagle Ridge North, and an additional 364 trips would be generated by others, a total of 2,898 trips per day for all anticipated development that will access Eagle Ridge Drive west of its existing terminus.

Roadways and Intersection Configuration

Palisades Boulevard begins at Shea Boulevard and loops northerly and easterly until it terminates at Saguaro Boulevard. Per MCDOT's *Major Roads and Streets Plan* (MSRP), Palisades Boulevard is classified by the Town as a minor arterial roadway.

Eagle Ridge Drive begins at Palisades Boulevard and extends northwesterly approximately 0.84 miles, all of which is in the City of Scottsdale except for the last nearly one-tenth of a mile. Eagle Ridge Drive intersects Palisades Boulevard opposite **Palomino Boulevard**, which extends from Palisades Boulevard southeasterly to Saguaro Boulevard. Per the MSRP, Palomino Boulevard is classified as a major collector roadway. The short segment of existing Eagle Ridge Drive is currently unclassified; however, CivTech notes that its design conforms to that of a minor collector roadway and it will be extended as such into the Adero Canyon development. Eagle Ridge Drive has no homes with direct access to it. Palomino Boulevard does have homes with direct access. Both primarily serve, and will continue to serve, residential development.

The intersection of Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard is presently configured as a four-legged intersection with stop-control on all four approaches. The approaches intersect at approximately right angles.

- The northbound Palisades Boulevard approach (south leg) is configured with a shared left-turn/through lane, a through lane, and an exclusive right turn lane. Aerial photography reveals that the median on this leg narrows on the west side, the opposite of what might typically be expected. "Skip-striping" along it indicates that it can serve as an acceleration lane for traffic turning from Palomino Boulevard onto Palisades Boulevard southbound. This northbound approach is in a horizontal curve to the right approaching Eagle Ridge Drive/Palomino Boulevard. There are bicycle lanes in both directions and the speed limit on this approach is 45 mph.
- The southbound approach (north leg) is on a tangent section approaching Eagle Ridge Drive/Palomino Boulevard. It is configured with an exclusive left turn lane, a through lane, and a shared right-turn/through lane. There are bicycle lanes in both directions and the speed limit on this approach is 45 mph.
- The eastbound Eagle Ridge Drive approach (west leg) is on a tangent section approaching Palisades Boulevard. It is configured with an exclusive left turn lane and a shared right-turn/through lane. There are bicycle lanes in both directions, with the eastbound bicycle lane terminating near where the left turn storage begins approximately 125 feet back from the stop bar. The speed limit on this approach is 35 mph.

on the major street exceed the maximum volumes on each of the appropriate graphs described above, volumes not currently present on Palisades Boulevard. Based on the current levels of traffic on Palisades Boulevard, the higher numbers govern.

Analysis: The results of the volume-based traffic signal warrants analysis indicate Palisades Boulevard easily exceeds the major street criteria for Warrant 1 (with current traffic volumes) while the approach volume from either the westbound Palomino Boulevard approach or the eastbound Eagle Ridge Drive approach do not currently meet the Warrant Satisfying Traffic Volumes for Warrants 1, 2, and 3. With reference to ***Attachment 4****, the attached analysis printout, note that, of the eight highest volume minor street approaches, five, including the top four, were from the westbound Palomino Boulevard approach, an approach that would carry very little Adero Canyon site traffic in the future. In the eighth highest hour, both minor street approaches had an equal number of vehicles approaching over the three days.*

Future Need for a Traffic Signal

In order to assess the future need for a traffic signal, certain information must be considered. Among these are the trips generated by a proposed development, how those trips are generated by hour of the day, and then how they are assigned to the intersection approaches.

Site Trip Generation

Table 2 presents the trips generation calculations that were summarized in text of CivTech's January 16, 2014 Traffic Statement. They are again presented here in more detail to show the peak hour trip generations for the hours typically associated with the adjacent street traffic (an hour between 7 and 9 AM and an hour between 4 and 6 PM) and to show the peak trip-generating hour of each generator on a typical weekday morning and afternoon.

Table 2 – Trip Generation Calculations – Adero Canyon

Land Use	Code	ITE Land Use Name	Quantity Units	Daily Trips Generated			
				Average Rate	Total	In & Out	% of All Trips
Homes	210	Single-Family Detached Housing	176 DUs*	9.52	1,676	838	66.1%
Luxury Condominium	233	Luxury Condominium/Townhouse	44 DUs	5.86	258	129	10.2%
Resort Hotel	330	Resort Hotel	120 Rooms	5.00	600	300	23.7%
				Totals	2,534	1,267	100.0%

Peak Hour of Adjacent Street Traffic	AM Peak Hour				PM Peak Hour			
Land Use	Average Rate	In (% In)	Out (% Out)	Total	Average Rate	In (% In)	Out (% Out)	Total
Homes	0.75	33 (25%)	99 (75%)	132	1.00	111 (63%)	65 (37%)	176
Luxury Condominium/Townhouse	0.56	6 (23%)	19 (77%)	25	0.55	16 (63%)	9 (37%)	25
Resort Hotel	0.37	32 (72%)	13 (28%)	79	0.49	25 (43%)	34 (57%)	59
TOTALS		71	131	202		152	108	260

Peak Hour of Generator	AM Peak Hour				PM Peak Hour			
Land Use	Average Rate	In (% In)	Out (% Out)	Total	Average Rate	In (% In)	Out (% Out)	Total
Homes	0.77	35 (26%)	101 (74%)	136	1.02	115 (64%)	65 (36%)	180
Luxury Condominium/Townhouse	0.65	9 (32%)	20 (68%)	29	0.65	17 (60%)	12 (40%)	29
Resort Hotel	0.47	36 (63%)	21 (37%)	57	0.59	36 (50%)	36 (50%)	72
TOTALS		80	142	222		168	113	281

*DUs = Dwelling Units

Table 3 presents the trip generation calculations for Scottsdale Mountain Estates and for the Town's trailhead, which was considered a "State Park" (ITE Land Use Code 413) by Kimley-Horn study, as presented in CivTech's January traffic statement. ITE's *Trip Generation*, the

source of the average rates used to calculate the trips, does not provide weekday AM and PM peak hour average rates for a State Park, so CivTech used the average AM and PM peak hour rates and trip distribution (in/out) percentages for a County Park (Code 412) to generate the trips for the peak hours of adjacent street traffic. Rates and trip distribution percentages estimated by CivTech were used to calculate peak hour trips for each generator; County Park generator trip generation rates were nearly as high as the daily rate for the State Park and were, therefore, considered unacceptable. CivTech settled on rates that were approximately nine percent of the daily rate for the morning and fifteen percent in the afternoon.

Trip Distribution and Assignment

The Adero Canyon development is a primarily a residential development with access provided by only Eagle Ridge Drive. Since the proposed development consists of residential, the trip distribution pattern for this assessment should assume that the majority of the trips generated by the residential development would be employment-related. Employment-related trips are made by residents to employment opportunities within a given radius of the site—generally twelve miles—a typical commuting distance in the Phoenix metropolitan area.

Table 3 – Trip Generation Calculations – Other Development and Trailhead

Land Use	Code	ITE Land Use Name	Quantity Units	Daily Trips Generated			
				Average Rate	Total	In & Out	% of All Trips
Homes	210	Single-Family Detached Housing	13 DUs*	9.52	124	62	34.1%
Trailhead	413	State Park	367 Acres	0.65	240	120	65.9%
				Totals	364	182	100.0%

Peak Hour of Adjacent Street Traffic	AM Peak Hour				PM Peak Hour			
Land Use	Average Rate	In (% In)	Out (% Out)	Total	Average Rate	In (% In)	Out (% Out)	Total
Homes	0.75	3 (25%)	7 (75%)	10	1.00	8 (63%)	5 (37%)	13
Trailhead (use County Park, Code 412)	0.02	6 (71%)	2 (29%)	8	0.09	12 (35%)	22 (65%)	34
TOTALS		9	9	18		20	27	47

Peak Hour of Generator	AM Peak Hour				PM Peak Hour			
Land Use	Average Rate	In (% In)	Out (% Out)	Total	Average Rate	In (% In)	Out (% Out)	Total
Homes	0.77	3 (26%)	8 (74%)	11	1.02	9 (64%)	5 (36%)	14
Trailhead	0.06†	16 (70%)	7 (30%)	23	0.10†	13 (35%)	24 (65%)	37
TOTALS		19	15	34		22	29	51

*DUs = Dwelling Units; †Estimated rate.

The peak hour trip distribution percentages for Adero Canyon in **Table 2** reflect that more residents will leave the development in the morning, presumably to go to work, than enter it, and that more would return to the development in the evening than leave it, as they return home from work. With no major employment centers within the Town limits, one could assume that residents leaving developments along Eagle Ridge Drive and Palomino Boulevard in the morning would more likely turn to go south on Palisades Boulevard because that leads to Shea Boulevard, which leads to employment centers outside of Fountain Hills. And, indeed, the turning movements recorded for the two AM peak hours confirm this, as do the PM peak hours, which confirm it by demonstrating a similar distribution pattern in reverse during the PM peak hour. **Table 4** presents the outbound east- and westbound turn and through movements recorded, the inbound movements to Eagle Ridge Drive, and the percentages used to assign trips generated by the future development described above to the intersection.

Table 4 – Minor Street Approach Turn Percentages, Outbound and Inbound

Period	Approach: / Movement:	Eagle Ridge Drive Eastbound				Palomino Boulevard Westbound			
		Left	Thru	Right	Total	Left	Thru	Right	Total
OUTBOUND									
2-Hour AM Volumes (7-9 AM)		29	9	47	85	78	12	45	135
2-Hour Approach %		34.12	10.59	55.29		57.78	8.89	33.33	
AM Average Approach % Used		34%	11%	55%	100%	58%	9%	33%	100%
2-Hour PM Volumes (4-6 PM)		37	12	32	81	37	13	34	219
2-Hour Approach %		45.68	14.81	39.51		44.05	15.48	40.48	
PM Average Approach % Used		46%	15%	39%	100%	44%	15%	41%	100%

Period	Approach: / Movement:	Eagle Ridge Drive Westbound			
		NB Left	WB Thru	SB Right	Total
INBOUND					
2-Hour AM Volumes (7-9 AM)		33	12	31	76
AM Average Inbound % Used		43%	16%	41%	100%
2-Hour PM Volumes (4-6 PM)		68	13	21	102
PM Average Inbound % Used		67%	13%	20%	100%

Hourly Trip Variations

A full traffic signal warrant analysis requires as many as eight hours of traffic counts for a proper evaluation. Both Eagle Ridge Drive and Palomino Boulevard serve areas that are residential in nature. The proposed Adero Canyon development is generally residential in nature, as is Scottsdale Mountain Estates. Residential neighborhoods have their own unique hourly trip variations; that is, the traffic entering and exiting the neighborhood will vary over the course of a typical weekday.

CivTech developed a residential trip distribution for the area around the study intersection by dividing the total number of vehicles counted approaching and the total departing Eagle Ridge Drive and Palomino Boulevard during each hour of the day by the trips counted entering or departing the intersection for the average 24-hour period. The results of this effort is summarized in **Table 5**, which presents the results for the eight highest hours as used in the traffic signal warrant analysis above and five additional hours that occurred beginning at 6 AM and ending at 9 PM.

Table 5 – Hourly Approach Volumes Summary (6 AM to 9 PM)

Start of Hour	Palomino Boulevard		Eagle Ridge Drive		Outbound Total	Outbound Percentage	Inbound Total	Inbound Percentage	Rank
	WB Approach Outbound	EB Depart Inbound	EB Approach Outbound	WB Depart Inbound					
11:00	54	31	73	57	127	9.28%	88	6.43%	1
07:00	69	43	34	32	103	7.53%	75	5.48%	2
08:00	68	28	44	60	112	8.19%	88	6.43%	3
09:00	52	32	60	37	112	8.19%	69	5.04%	4
14:45	44	68	54	48	98	7.16%	116	8.47%	5
10:00	48	27	54	40	102	7.46%	67	4.89%	6
16:15	42	67	52	62	94	6.87%	129	9.42%	7
12:00	41	56	52	60	93	6.80%	116	8.47%	8
13:30	43	59	38	37	81	5.92%	96	7.01%	9
17:30	35	47	40	48	75	5.48%	95	6.94%	10
20:00	24	21	34	22	58	4.24%	43	3.14%	11
18:30	27	30	22	35	49	3.58%	65	4.75%	12
06:00	25	33	18	16	43	3.14%	49	3.58%	13
24-hour totals					1,368		1,369		

Site Trip Assignment. Since, as a primarily residential development, Adero Canyon will be similar in character to the development that generates the traffic on Eagle Ridge Drive and Palomino Boulevard, the percentages derived in **Table 5** can be applied to the total site trips generated by Adero Canyon to estimate a site trip distribution for the corresponding hours of the day and used in an analysis. The only exceptions are the four hours for which trips generation rates are available in the ITE compendium, *Trip Generation*. For these four hours the trip generations for the AM and PM peak hours of the generator (development) was included in addition to those of the peak hours of adjacent street traffic. The same was done for Scottsdale Mountain Ranch and for the trailhead. This outbound site trip distribution is summarized in **Table 6**. A total of 1,449 outbound trips is expected each day.

Table 6 – Hourly Approach Volumes Summary (6 AM to 9 PM) at Full Build-Out as Proposed

Start of Hour	Outbound Percentage	Adero Canyon Outbound	Sctsdl Mtn Estates + Trailhead	Total Outbound
11:00	*	142	17	159
14:45	*	113	14	127
08:00		131	15	146
16:15	*	108	13	121
09:00	8.16%	104	15	119
10:00	7.46%	95	14	109
12:00	6.80%	87	13	100
07:00	7.53%	96	14	110
13:30	5.92%	76	11	87
17:30	5.48%	70	10	80
20:00	4.24%	54	8	62
18:30	3.58%	46	7	53
06:00	3.14%	40	6	46
24-hour		1,267	182	1,449

*Values calculated using equations from *Trip Generation, 9th Edition.*

Total Approach Volumes. The expected hourly outbound/eastbound trips from the Adero Canyon development, Scottsdale Mountain Ranch, and the trailhead at full build-out at various stages of completion were then added to the existing Eagle Ridge Drive volumes; this yielded the approach volumes to be used in the warrant analysis.[1] Since the approach volumes at full build-out (shown in **Attachment 5)** did satisfy the warranting criteria, CivTech's next step was to estimate at what stage of completion or occupancy the development would be generating sufficient trips to warrant the traffic signal. This yielded future hourly volumes (rounded to the nearest 5 vehicles) to be considered for the signal warrant.

Table 7 – Future Warrant Analysis Volumes (Highest 8 hours)

Start of Hour	Eagle Ridge EB Existing	All New Development Outbound	Warrant 1B Minor Street 70 vph (29%)	Warrant 2 Minor Street 80 vph (15%)
11:00	73	157	125	100
14:45	54	142	100	80
08:00	44	145	90	
16:15	52	135	95	80
09:00	60	118	95	80
10:00	54	109	90	
12:00	52	100	85	
07:00	34	105	70	

Analysis. The minimum warrant satisfying values in **Table 1** are at least 70 vehicles per hour for eight hours for Warrant 1, Condition B, and at least 80 vehicles per hour for four hours for Warrant 2. CivTech assumed that the existing eastbound volumes on Eagle Ridge Drive would remain approximately the same and then estimated the percentages of trips that would be required of the development in order to meet these minimums. As few as 15% of the trips would satisfy Warrant 2, the Four-Hour Warrant, and 29% would satisfy Warrant 1B. With a total of 1,449 outbound trips expected

[1] *A similar exercise was conducted for westbound Palomino Parkway with the anticipated number of inbound Adero Canyon trips. The westbound Palomino Boulevard approach warrant volume was less than the eastbound volume. For this reason, the calculations are not presented herein.*

each day, just the trips generated by the luxury condos proposed for Adero Canyon and the Town's trailhead (a total of 249 outbound trips) could satisfy at least one traffic signal warrant (249/1,449=17%). **Table 7** applies these percentages to the full build-out hourly volumes and adds them to existing volumes to show the warrant satisfying values.

Assuming the Adero Canyon project gets underway in 2015 and is built out over a period of six or seven years (an estimated completion date of 2022), one of the signal warrants could be met within a year of the start of new home construction. However, as will be demonstrated below, however, CivTech does not consider satisfying either or both of these warrants to be conclusive proof that a traffic signal should be installed. Before that discussion, several other issues must be addressed.

Northbound Left Turn Auxiliary Lane on Palisades Boulevard
As noted above, the northbound approach of Palisades Boulevard to Eagle Ridge Drive/Palomino Boulevard currently provides three lanes, a shared left-turn/through lane, a through lane, and an exclusive right turn lane. The current four-way stop effectively prohibits vehicles from traveling through the intersection at the speed limit. Such through movements will be allowed on a green light when a traffic signal is installed. For this reason, it is recommended that a northbound left turn lane be constructed to coincide with the installation and operation of a traffic signal.

South- and Eastbound Right Turn Auxiliary Lanes
Chapter 6 of the Maricopa County Department of Transportation (MCDOT) Roadway Design Manual (RDM) is dedicated to the intersection of public roadways. In the RDM, a right turn auxiliary lane is warranted when right turn volumes exceed 300 turns per hour, such as at a major urban intersection. Such a turn lane takes right turn movements out of the stream of through traffic. This improves the overall operation of the intersection for two reasons: 1) right turning vehicles must slow in order to turn, slowing trailing through vehicles and 2) it reduces the volume of traffic in the through lane. At intersections of heavily-traveled major arterial roadways that operate at poor levels of service during peak hours, such auxiliary lanes can provide extra capacity that enhances operation.

With reference to **Table 7**, the peak hourly approach volume anticipated on Eagle Ridge Drive eastbound is about 230 vehicles per hour (73+157=230) for all movements. Since this is well below the MCDOT threshold for right turns, a right turn auxiliary lane is not warranted on Eagle Ridge Drive approaching Palisades Boulevard. And, as can be seen in **Attachment 5**, the southbound right turn movement is also well under 300 vehicles per hour.

Geometric Considerations
A field review of the geometric conditions of the intersection revealed that both Palisades Boulevard approaches to Eagle Ridge Drive/Palomino Boulevard approach on horizontal curves and on an uphill grade limiting sight distance. These conditions are not an issue under the current all-way stop control since there is no traffic moving straight through the intersection in any direction without stopping.

However, CivTech is concerned that there may not be sufficient sight distance for drivers intending to turn right on red from the side streets to see approaching vehicles on Palisades Boulevard or for drivers intending to turn left from Palisades Boulevard to see opposing vehicles. Therefore, if and when a traffic signal is installed, we recommend prohibiting right turns on red for the east- and westbound approaches and we recommend protected-only left-turn phasing for the left turns in both directions from Palisades Boulevard.

Conclusions and Recommendations
The following conclusions and recommendations have been documented above:

- The total traffic expected from the Adero Canyon development (2,534 trips per day) represent under 8% [2,534÷(30,110+2,998)=7.7%] of the total traffic through the intersection using the current traffic volumes from all four legs. Using projected 2030 traffic volumes totaling almost 45,000 vpd, the Adero Canyon development would contribute an even smaller percentage, 5.6% of the volume through the intersection.
- A traffic signal is not currently warranted at the intersection of Palisades Boulevard and Eagle Ridge Drive/Palomino Boulevard. The warranting criterion for Warrant 2 for a future traffic signal could be satisfied with as few as fifteen percent of the trips generated by the development of Adero Canyon.
- A northbound left turn auxiliary lane on Palisades Boulevard should be provided with installation of the traffic signal. It is not needed before.
- No right turn auxiliary lanes, either eastbound on Eagle Ridge Drive approaching Palisades Boulevard or southbound on Palisades Boulevard approaching Eagle Ridge Drive, are warranted, with or without the installation of a traffic signal and regardless of any generated by Adero Canyon, whether under the original or revised site plan.
- Geometric conditions limit visibility such that, if a traffic signal is installed, the Town should prohibit right turns on red from both side street approaches and provide protected-only left turn phasing for north- and southbound traffic on Palisades Boulevard.
- While the warranting criterion for Warrant 2 would be met with as few as fifteen percent of the trips generated by Adero Canyon added to the existing traffic volumes on Eagle Ridge Drive, the intersection capacity analysis revealed that the intersection could operate at acceptable levels of service (LOS C) in both peak hours at least through 2030 as a four-way stop-controlled intersection, even with full build-out of Adero Canyon. This gives the Town some discretion and some time to determine when they would install the signal.
- The additional 836 trips to be generated by Adero Canyon will have no impact on the operation of Eagle Ridge Drive or the recommended improvements to the intersection in either scope or timing.

We look forward to your consideration and approval of this analysis. If you have any further questions or comments or you wish to discuss this analysis further, please contact CivTech at (480) 659-4250.

Sincerely,

CivTech

Joseph F. Spadafino, PE, PTOE
Project Manager/Senior Traffic Engineer

JFS:jfs

☒ Attachments (7)
1) Vicinity Map
2) Traffic Counts
3) MUTCD Figures
4) Signal Warrant Analysis Sheet
5) 2021 & 2030 Turning Movements
6) Growth Rate Calculations
7) Synchro Worksheets

APPENDIX G

2018 PEAK HOUR ANALYSIS

CivTech

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	7	4	71	8	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	79	9	3	30

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	120	83	0	0	88	0
Stage 1	83	-	-	-	-	-
Stage 2	37	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	876	976	-	-	1508	-
Stage 1	940	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	874	976	-	-	1508	-
Mov Cap-2 Maneuver	874	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	983	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	909	1508	-
HCM Lane V/C Ratio	-	-	0.013	0.002	-
HCM Control Delay (s)	-	-	9	7.4	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	0	0	1	1	4	4	72	1	1	41	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	0	1	1	4	4	80	1	1	46	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	140	138	46	137	137	81	46	0	0	81	0	0
Stage 1	48	48	-	89	89	-	-	-	-	-	-	-
Stage 2	92	90	-	48	48	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	830	753	1023	834	754	979	1562	-	-	1517	-	-
Stage 1	965	855	-	918	821	-	-	-	-	-	-	-
Stage 2	915	820	-	965	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	823	751	1023	832	752	979	1562	-	-	1517	-	-
Mov Cap-2 Maneuver	823	751	-	832	752	-	-	-	-	-	-	-
Stage 1	963	854	-	916	819	-	-	-	-	-	-	-
Stage 2	907	818	-	964	854	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9	0.4	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	823	907	1517	-	-
HCM Lane V/C Ratio	0.003	-	-	0.007	0.007	0.001	-	-
HCM Control Delay (s)	7.3	-	-	9.4	9	7.4	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	51	0	1	74	0	1	0	0	16	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	57	0	1	82	0	1	0	0	18	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	82	0	0	57	0	0	141	141	57	141	141	82
Stage 1	-	-	-	-	-	-	57	57	-	84	84	-
Stage 2	-	-	-	-	-	-	84	84	-	57	57	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1515	-	-	1547	-	-	829	750	1009	829	750	978
Stage 1	-	-	-	-	-	-	955	847	-	924	825	-
Stage 2	-	-	-	-	-	-	924	825	-	955	847	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1515	-	-	1547	-	-	828	749	1009	828	749	978
Mov Cap-2 Maneuver	-	-	-	-	-	-	828	749	-	828	749	-
Stage 1	-	-	-	-	-	-	955	847	-	924	824	-
Stage 2	-	-	-	-	-	-	923	824	-	955	847	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	9.4	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	828	1515	-	-	1547	-	-	828
HCM Lane V/C Ratio	0.001	-	-	-	0.001	-	-	0.021
HCM Control Delay (s)	9.4	0	-	-	7.3	0	-	9.4
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	29.8
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	17	1	30	0	36	3	23	0	45	279	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	19	1	33	0	40	3	26	0	50	310	6
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	11.1	11.5	13.6
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	33%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	67%	100%	0%	0%	3%	0%	12%	0%	100%	92%
Vol Right, %	0%	0%	100%	0%	97%	0%	88%	0%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	138	186	5	17	31	36	26	8	519	283
LT Vol	45	0	0	17	0	36	0	8	0	0
Through Vol	93	186	0	0	1	0	3	0	519	260
RT Vol	0	0	5	0	30	0	23	0	0	23
Lane Flow Rate	153	207	6	19	34	40	29	9	577	314
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.301	0.396	0.01	0.045	0.07	0.094	0.059	0.016	0.963	0.519
Departure Headway (Hd)	7.057	6.893	6.187	8.513	7.327	8.446	7.32	6.512	6.008	5.951
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	508	521	576	419	486	422	486	549	600	603
Service Time	4.825	4.661	3.955	6.303	5.117	6.234	5.108	4.265	3.762	3.705
HCM Lane V/C Ratio	0.301	0.397	0.01	0.045	0.07	0.095	0.06	0.016	0.962	0.521
HCM Control Delay	12.9	14.2	9	11.7	10.7	12.1	10.6	9.4	52.4	15
HCM Lane LOS	B	B	A	B	B	B	B	A	F	B
HCM 95th-tile Q	1.3	1.9	0	0.1	0.2	0.3	0.2	0	13.3	3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	779	23
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	866	26
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	38.9
HCM LOS	E

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	265	446	7	1	987	55	12	10	12	78	4	816
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	294	496	8	1	1097	61	13	11	13	87	4	907
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	379	2167	675	2	1613	572	22	273	323	630	713	1373
Arrive On Green	0.11	0.43	0.43	0.00	0.32	0.32	0.01	0.35	0.35	0.04	0.38	0.38
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	779	921	1774	1863	2787
Grp Volume(v), veh/h	294	496	8	1	1097	61	13	0	24	87	4	907
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1700	1774	1863	1393
Q Serve(g_s), s	7.5	5.6	0.3	0.1	16.9	2.3	0.7	0.0	0.8	2.8	0.1	22.0
Cycle Q Clear(g_c), s	7.5	5.6	0.3	0.1	16.9	2.3	0.7	0.0	0.8	2.8	0.1	22.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	379	2167	675	2	1613	572	22	0	596	630	713	1373
V/C Ratio(X)	0.78	0.23	0.01	0.51	0.68	0.11	0.59	0.00	0.04	0.14	0.01	0.66
Avail Cap(c_a), veh/h	535	2373	739	118	1921	669	118	0	596	630	713	1373
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.0	16.4	14.9	44.9	26.8	19.1	44.2	0.0	19.2	16.8	17.2	17.2
Incr Delay (d2), s/veh	4.6	0.1	0.0	128.6	0.8	0.1	23.1	0.0	0.1	0.1	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	2.6	0.1	0.1	8.0	1.0	0.5	0.0	0.4	1.3	0.1	8.9
LnGrp Delay(d),s/veh	43.6	16.5	14.9	173.5	27.5	19.2	67.3	0.0	19.4	16.9	17.2	19.7
LnGrp LOS	D	B	B	F	C	B	E		B	B	B	B
Approach Vol, veh/h		798			1159			37			998	
Approach Delay, s/veh		26.5			27.2			36.2			19.4	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	35.6	4.1	42.3	5.1	38.4	13.9	32.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	1.8	2.8	2.1	7.6	2.7	24.0	9.5	18.9
Green Ext Time (p_c), s	0.0	4.2	0.0	15.6	0.0	0.0	0.4	9.6

Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	24	0	16	59	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	0	18	66	0	7

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	58	51	0	0	83	0
Stage 1	51	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	949	1017	-	-	1514	-
Stage 1	971	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	949	1017	-	-	1514	-
Mov Cap-2 Maneuver	949	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 949	1514	-
HCM Lane V/C Ratio	-	- 0.028	-	-
HCM Control Delay (s)	-	- 8.9	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	7	4	10	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	11	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	11	0	-	0	31	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	20	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1608	-	-	-	983	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1003	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1608	-	-	-	978	1070
Mov Cap-2 Maneuver	-	-	-	-	978	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	998	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1608	-	-	-	1070
HCM Lane V/C Ratio	0.005	-	-	-	0.001
HCM Control Delay (s)	7.2	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	12	7	33	13	4	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	8	37	14	4	44

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	97	44	0	0	51	0
Stage 1	44	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	902	1026	-	-	1555	-
Stage 1	978	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	900	1026	-	-	1555	-
Mov Cap-2 Maneuver	900	-	-	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	943	1555	-
HCM Lane V/C Ratio	-	-	0.022	0.003	-
HCM Control Delay (s)	-	-	8.9	7.3	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	0	0	0	0	3	3	47	1	0	55	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	0	0	0	3	3	52	1	0	61	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	123	122	62	121	122	53	63	0	0	53	0	0
Stage 1	62	62	-	59	59	-	-	-	-	-	-	-
Stage 2	61	60	-	62	63	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	852	768	1003	854	768	1014	1540	-	-	1553	-	-
Stage 1	949	843	-	953	846	-	-	-	-	-	-	-
Stage 2	950	845	-	949	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	848	767	1003	853	767	1014	1540	-	-	1553	-	-
Mov Cap-2 Maneuver	848	767	-	853	767	-	-	-	-	-	-	-
Stage 1	947	843	-	951	844	-	-	-	-	-	-	-
Stage 2	945	843	-	949	842	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	8.6	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1540	-	-	848	1014	1553	-	-
HCM Lane V/C Ratio	0.002	-	-	0.004	0.003	-	-	-
HCM Control Delay (s)	7.3	-	-	9.3	8.6	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South

2/15/2017

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	66	1	0	48	22	0	0	1	16	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	73	1	0	53	24	0	0	1	18	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	78	0	0	74	0	0	142	154	74	143	143	66
Stage 1	-	-	-	-	-	-	76	76	-	66	66	-
Stage 2	-	-	-	-	-	-	66	78	-	77	77	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1520	-	-	1526	-	-	828	738	988	826	748	998
Stage 1	-	-	-	-	-	-	933	832	-	945	840	-
Stage 2	-	-	-	-	-	-	945	830	-	932	831	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1520	-	-	1526	-	-	827	738	988	825	748	998
Mov Cap-2 Maneuver	-	-	-	-	-	-	827	738	-	825	748	-
Stage 1	-	-	-	-	-	-	932	831	-	944	840	-
Stage 2	-	-	-	-	-	-	944	830	-	930	830	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	8.6	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	988	1520	-	-	1526	-	-	833
HCM Lane V/C Ratio	0.001	0.001	-	-	-	-	-	0.023
HCM Control Delay (s)	8.6	7.4	-	-	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd

2/15/2017

Intersection	
Intersection Delay, s/veh	23.2
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	31	6	32	0	21	4	16	0	19	689	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	34	7	36	0	23	4	18	0	21	766	41
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	11.5	11.4	29.3
HCM LOS	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	8%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	92%	100%	0%	0%	16%	0%	20%	0%	100%	87%
Vol Right, %	0%	0%	100%	0%	84%	0%	80%	0%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	249	459	37	31	38	21	20	12	257	147
LT Vol	19	0	0	31	0	21	0	12	0	0
Through Vol	230	459	0	0	6	0	4	0	257	128
RT Vol	0	0	37	0	32	0	16	0	0	19
Lane Flow Rate	276	510	41	34	42	23	22	13	285	164
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.48	0.881	0.063	0.082	0.087	0.057	0.047	0.027	0.539	0.305
Departure Headway (Hd)	6.252	6.214	5.509	8.542	7.445	8.761	7.692	7.312	6.808	6.717
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	575	582	647	417	478	411	468	488	528	532
Service Time	4.013	3.975	3.269	6.341	5.243	6.461	5.392	5.086	4.582	4.491
HCM Lane V/C Ratio	0.48	0.876	0.063	0.082	0.088	0.056	0.047	0.027	0.54	0.308
HCM Control Delay	14.7	38.8	8.6	12.1	11	12	10.8	10.3	17.3	12.4
HCM Lane LOS	B	E	A	B	B	B	B	B	C	B
HCM 95th-tile Q	2.6	10.1	0.2	0.3	0.3	0.2	0.1	0.1	3.2	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	12	385	19
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	13	428	21
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	15.4
HCM LOS	C

Lane	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	696	1294	15	4	620	77	21	3	3	48	7	371
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	773	1438	17	4	689	86	23	3	3	53	8	412
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	835	2392	745	8	1179	419	34	270	270	577	611	1591
Arrive On Green	0.24	0.47	0.47	0.00	0.23	0.23	0.02	0.31	0.31	0.03	0.33	0.33
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	773	1438	17	4	689	86	23	0	6	53	8	412
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	19.7	18.8	0.5	0.2	10.8	3.8	1.2	0.0	0.2	1.8	0.3	6.7
Cycle Q Clear(g_c), s	19.7	18.8	0.5	0.2	10.8	3.8	1.2	0.0	0.2	1.8	0.3	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	835	2392	745	8	1179	419	34	0	539	577	611	1591
V/C Ratio(X)	0.93	0.60	0.02	0.53	0.58	0.21	0.67	0.00	0.01	0.09	0.01	0.26
Avail Cap(c_a), veh/h	841	2392	745	296	1808	615	79	0	539	598	611	1591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	17.6	12.8	44.7	30.7	25.7	43.8	0.0	21.2	19.7	20.4	9.7
Incr Delay (d2), s/veh	15.8	0.4	0.0	48.1	0.5	0.2	19.9	0.0	0.0	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	8.9	0.2	0.2	5.1	1.7	0.8	0.0	0.1	0.9	0.1	2.6
LnGrp Delay(d),s/veh	49.1	18.0	12.8	92.9	31.2	26.0	63.8	0.0	21.2	19.8	20.4	10.1
LnGrp LOS	D	B	B	F	C	C	E		C	B	C	B
Approach Vol, veh/h		2228			779			29			473	
Approach Delay, s/veh		28.8			30.9			55.0			11.4	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	32.3	4.4	46.3	5.7	33.5	25.8	24.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.8	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	3.8	2.2	2.2	20.8	3.2	8.7	21.7	12.8
Green Ext Time (p_c), s	0.0	1.5	0.0	14.0	0.0	1.1	0.1	8.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.1
HCM 2010 LOS	C

HCM 2010 TWSC
6: Eagle Ridge Dr & Driveway A 2/15/2017

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	41	0	2	38	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	0	2	42	0	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	26	23	0	0	44	0
Stage 1	23	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	989	1054	-	-	1564	-
Stage 1	1000	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	989	1054	-	-	1564	-
Mov Cap-2 Maneuver	989	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 989	1564	-
HCM Lane V/C Ratio	-	- 0.046	-	-
HCM Control Delay (s)	-	- 8.8	0	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

HCM 2010 TWSC
7: Copperwynd Dr & Driveway B 2/15/2017

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	7	10	8	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	11	9	0	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	9	0	-	0	36	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1611	-	-	-	977	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1611	-	-	-	972	1073
Mov Cap-2 Maneuver	-	-	-	-	972	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1073
HCM Lane V/C Ratio	0.005	-	-	-	0.011
HCM Control Delay (s)	7.2	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	4	101	15	3	49
Future Vol, veh/h	12	4	101	15	3	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	4	112	17	3	54

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	182	121	0	0	129	0
Stage 1	121	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	807	930	-	-	1457	-
Stage 1	904	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	805	930	-	-	1457	-
Mov Cap-2 Maneuver	805	-	-	-	-	-
Stage 1	904	-	-	-	-	-
Stage 2	960	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	833	1457	-
HCM Lane V/C Ratio	-	-	0.021	0.002	-
HCM Control Delay (s)	-	-	9.4	7.5	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↰	↱
Traffic Vol, veh/h	5	0	0	1	1	4	4	109	1	1	68	0
Future Vol, veh/h	5	0	0	1	1	4	4	109	1	1	68	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	0	1	1	4	4	121	1	1	76	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	211	209	76	209	209	122	76	0	0	122	0	0
Stage 1	78	78	-	131	131	-	-	-	-	-	-	-
Stage 2	133	131	-	78	78	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	746	688	985	748	688	929	1523	-	-	1465	-	-
Stage 1	931	830	-	873	788	-	-	-	-	-	-	-
Stage 2	870	788	-	931	830	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	740	686	985	746	686	929	1523	-	-	1465	-	-
Mov Cap-2 Maneuver	740	686	-	746	686	-	-	-	-	-	-	-
Stage 1	929	829	-	871	786	-	-	-	-	-	-	-
Stage 2	862	786	-	930	829	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	9.3	0.3	0.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1523	-	-	740	845	1465	-	-
HCM Lane V/C Ratio	0.003	-	-	0.008	0.008	0.001	-	-
HCM Control Delay (s)	7.4	-	-	9.9	9.3	7.5	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	78	0	1	111	0	1	0	0	16	0	0
Future Vol, veh/h	0	78	0	1	111	0	1	0	0	16	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	87	0	1	123	0	1	0	0	18	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	123	0	0	87	0	0	213	213	87	213	213	123
Stage 1	-	-	-	-	-	-	87	87	-	126	126	-
Stage 2	-	-	-	-	-	-	126	126	-	87	87	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1464	-	-	1509	-	-	744	684	971	744	684	928
Stage 1	-	-	-	-	-	-	921	823	-	878	792	-
Stage 2	-	-	-	-	-	-	878	792	-	921	823	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1464	-	-	1509	-	-	743	683	971	743	683	928
Mov Cap-2 Maneuver	-	-	-	-	-	-	743	683	-	743	683	-
Stage 1	-	-	-	-	-	-	921	823	-	878	791	-
Stage 2	-	-	-	-	-	-	877	791	-	921	823	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	9.9	10
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	743	1464	-	-	1509	-	-	743
HCM Lane V/C Ratio	0.001	-	-	-	0.001	-	-	0.024
HCM Control Delay (s)	9.9	0	-	-	7.4	-	-	10
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	33.8
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	20	1	54	0	36	3	23	0	78	279	5
Future Vol, veh/h	0	20	1	54	0	36	3	23	0	78	279	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	22	1	60	0	40	3	26	0	87	310	6
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	11.6	11.8	14.6
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	46%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	54%	100%	0%	0%	2%	0%	12%	0%	100%	91%
Vol Right, %	0%	0%	100%	0%	98%	0%	88%	0%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	171	186	5	20	55	36	26	8	519	287
LT Vol	78	0	0	20	0	36	0	8	0	0
Through Vol	93	186	0	0	1	0	3	0	519	260
RT Vol	0	0	5	0	54	0	23	0	0	27
Lane Flow Rate	190	207	6	22	61	40	29	9	577	319
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.386	0.407	0.01	0.054	0.127	0.097	0.061	0.017	1.002	0.547
Departure Headway (Hd)	7.315	7.085	6.377	8.801	7.603	8.844	7.715	6.756	6.252	6.185
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	488	504	557	409	474	408	467	527	577	580
Service Time	5.104	4.873	4.166	6.501	5.303	6.544	5.415	4.528	4.024	3.957
HCM Lane V/C Ratio	0.389	0.411	0.011	0.054	0.129	0.098	0.062	0.017	1	0.55
HCM Control Delay	14.7	14.7	9.2	12	11.4	12.5	10.9	9.6	62.9	16.3
HCM Lane LOS	B	B	A	B	B	B	B	A	F	C
HCM 95th-tile Q	1.8	2	0	0.2	0.4	0.3	0.2	0.1	14.7	3.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	8	779	27
Future Vol, veh/h	0	8	779	27
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	866	30
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	46
HCM LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	284	446	7	1	987	70	12	10	12	89	4	830
Future Volume (veh/h)	284	446	7	1	987	70	12	10	12	89	4	830
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	316	496	8	1	1097	78	13	11	13	99	4	922
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	2200	685	2	1615	573	22	268	317	621	701	1372
Arrive On Green	0.12	0.43	0.43	0.00	0.32	0.32	0.01	0.34	0.34	0.04	0.38	0.38
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	779	921	1774	1863	2787
Grp Volume(v), veh/h	316	496	8	1	1097	78	13	0	24	99	4	922
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1700	1774	1863	1393
Q Serve(g_s), s	8.0	5.5	0.3	0.1	16.9	3.0	0.7	0.0	0.8	3.2	0.1	22.6
Cycle Q Clear(g_c), s	8.0	5.5	0.3	0.1	16.9	3.0	0.7	0.0	0.8	3.2	0.1	22.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	400	2200	685	2	1615	573	22	0	585	621	701	1372
V/C Ratio(X)	0.79	0.23	0.01	0.51	0.68	0.14	0.59	0.00	0.04	0.16	0.01	0.67
Avail Cap(c_a), veh/h	535	2373	739	118	1921	669	118	0	585	621	701	1372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	16.0	14.6	44.9	26.7	19.3	44.2	0.0	19.6	17.3	17.6	17.3
Incr Delay (d2), s/veh	5.7	0.1	0.0	128.6	0.8	0.1	23.1	0.0	0.1	0.1	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	2.6	0.1	0.1	8.0	1.3	0.5	0.0	0.4	1.6	0.1	9.2
LnGrp Delay(d),s/veh	44.4	16.1	14.6	173.5	27.5	19.4	67.3	0.0	19.8	17.4	17.6	20.0
LnGrp LOS	D	B	B	F	C	B	E		B	B	B	B
Approach Vol, veh/h		820			1176			37			1025	
Approach Delay, s/veh		27.0			27.1			36.5			19.7	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	35.0	4.1	42.9	5.1	37.8	14.5	32.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	6.2	2.8	2.1	7.5	2.7	24.6	10.0	18.9
Green Ext Time (p_c), s	0.0	4.3	0.0	15.7	0.0	0.0	0.4	9.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	0	16	89	0	6
Future Vol, veh/h	46	0	16	89	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	0	18	99	0	7

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	74	67	0	0	117	0
Stage 1	67	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	930	997	-	-	1471	-
Stage 1	956	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	930	997	-	-	1471	-
Mov Cap-2 Maneuver	930	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	930	1471	-
HCM Lane V/C Ratio	-	-	0.055	-	-
HCM Control Delay (s)	-	-	9.1	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	4	10	0	0	6
Future Vol, veh/h	14	4	10	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	4	11	0	0	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	11	0	-	0	47	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	36	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1608	-	-	-	963	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	986	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1608	-	-	-	953	1070
Mov Cap-2 Maneuver	-	-	-	-	953	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	976	-

Approach	EB	WB	SB
HCM Control Delay, s	5.6	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1608	-	-	-	1070
HCM Lane V/C Ratio	0.01	-	-	-	0.006
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	7	61	20	4	69
Future Vol, veh/h	19	7	61	20	4	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	8	68	22	4	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	165	79	0	0	90	0
Stage 1	79	-	-	-	-	-
Stage 2	86	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	826	981	-	-	1505	-
Stage 1	944	-	-	-	-	-
Stage 2	937	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	824	981	-	-	1505	-
Mov Cap-2 Maneuver	824	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	861	1505	-
HCM Lane V/C Ratio	-	-	0.034	0.003	-
HCM Control Delay (s)	-	-	9.3	7.4	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	3	0	0	0	0	3	3	82	1	0	91	2
Future Vol, veh/h	3	0	0	0	0	3	3	82	1	0	91	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	0	0	0	3	3	91	1	0	101	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	202	201	102	200	201	92	103	0	0	92	0	0
Stage 1	102	102	-	98	98	-	-	-	-	-	-	-
Stage 2	100	99	-	102	103	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	756	695	953	759	695	965	1489	-	-	1503	-	-
Stage 1	904	811	-	908	814	-	-	-	-	-	-	-
Stage 2	906	813	-	904	810	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	752	694	953	758	694	965	1489	-	-	1503	-	-
Mov Cap-2 Maneuver	752	694	-	758	694	-	-	-	-	-	-	-
Stage 1	902	811	-	906	812	-	-	-	-	-	-	-
Stage 2	901	811	-	904	810	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	8.7	0.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1489	-	-	752	965	1503	-	-
HCM Lane V/C Ratio	0.002	-	-	0.004	0.003	-	-	-
HCM Control Delay (s)	7.4	-	-	9.8	8.7	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	102	1	0	83	22	0	0	1	16	0	1
Future Vol, veh/h	1	102	1	0	83	22	0	0	1	16	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	113	1	0	92	24	0	0	1	18	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	117	0	0	-	-	0	221	233	114	221	221	104
Stage 1	-	-	-	-	-	-	116	116	-	104	104	-
Stage 2	-	-	-	-	-	-	105	117	-	117	117	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1471	-	-	0	-	-	735	667	939	735	678	951
Stage 1	-	-	-	0	-	-	889	800	-	902	809	-
Stage 2	-	-	-	0	-	-	901	799	-	888	799	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1471	-	-	-	-	-	734	667	939	734	678	951
Mov Cap-2 Maneuver	-	-	-	-	-	-	734	667	-	734	678	-
Stage 1	-	-	-	-	-	-	888	799	-	901	809	-
Stage 2	-	-	-	-	-	-	900	799	-	886	798	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	8.8	10
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	939	1471	-	-	-	-	744
HCM Lane V/C Ratio	0.001	0.001	-	-	-	-	0.025
HCM Control Delay (s)	8.8	7.4	-	-	-	-	10
HCM Lane LOS	A	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	-	-	0.1

Intersection	
Intersection Delay, s/veh	25.7
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	35	6	64	0	21	4	16	0	51	689	37
Future Vol, veh/h	0	35	6	64	0	21	4	16	0	51	689	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	39	7	71	0	23	4	18	0	57	766	41
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	12.1	11.8	33.2
HCM LOS	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	18%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	82%	100%	0%	0%	9%	0%	20%	0%	100%	85%
Vol Right, %	0%	0%	100%	0%	91%	0%	80%	0%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	281	459	37	35	70	21	20	12	257	151
LT Vol	51	0	0	35	0	21	0	12	0	0
Through Vol	230	459	0	0	6	0	4	0	257	128
RT Vol	0	0	37	0	64	0	16	0	0	23
Lane Flow Rate	312	510	41	39	78	23	22	13	285	168
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.565	0.911	0.065	0.095	0.165	0.059	0.049	0.028	0.569	0.33
Departure Headway (Hd)	6.624	6.532	5.825	8.808	7.658	9.088	8.015	7.685	7.179	7.071
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	549	556	619	408	471	396	448	469	505	511
Service Time	4.324	4.232	3.525	6.525	5.375	6.809	5.736	5.385	4.879	4.771
HCM Lane V/C Ratio	0.568	0.917	0.066	0.096	0.166	0.058	0.049	0.028	0.564	0.329
HCM Control Delay	17.6	44.7	8.9	12.4	11.9	12.4	11.1	10.6	18.9	13.2
HCM Lane LOS	C	E	A	B	B	B	B	B	C	B
HCM 95th-tile Q	3.5	11	0.2	0.3	0.6	0.2	0.2	0.1	3.5	1.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	12	385	23
Future Vol, veh/h	0	12	385	23
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	13	428	26
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	16.6
HCM LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	714	1294	15	4	620	91	21	3	3	62	7	389
Future Volume (veh/h)	714	1294	15	4	620	91	21	3	3	62	7	389
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	793	1438	17	4	689	101	23	3	3	69	8	432
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2398	747	8	1177	430	34	262	262	578	609	1592
Arrive On Green	0.24	0.47	0.47	0.00	0.23	0.23	0.02	0.31	0.31	0.04	0.33	0.33
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	793	1438	17	4	689	101	23	0	6	69	8	432
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	20.4	18.8	0.5	0.2	10.8	4.5	1.2	0.0	0.2	2.4	0.3	7.1
Cycle Q Clear(g_c), s	20.4	18.8	0.5	0.2	10.8	4.5	1.2	0.0	0.2	2.4	0.3	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	841	2398	747	8	1177	430	34	0	524	578	609	1592
V/C Ratio(X)	0.94	0.60	0.02	0.53	0.59	0.24	0.67	0.00	0.01	0.12	0.01	0.27
Avail Cap(c_a), veh/h	841	2398	747	296	1808	626	79	0	524	586	609	1592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	17.5	12.7	44.7	30.8	25.5	43.8	0.0	21.7	20.0	20.5	9.8
Incr Delay (d2), s/veh	18.6	0.4	0.0	48.1	0.5	0.3	19.9	0.0	0.0	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	8.7	0.2	0.2	5.1	2.0	0.8	0.0	0.1	1.2	0.1	2.8
LnGrp Delay(d),s/veh	52.0	17.9	12.7	92.9	31.2	25.8	63.8	0.0	21.8	20.1	20.5	10.2
LnGrp LOS	D	B	B	F	C	C	E		C	C	C	B
Approach Vol, veh/h		2248			794			29			509	
Approach Delay, s/veh		29.9			30.8			55.1			11.7	
Approach LOS		C			C			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	31.6	4.4	46.4	5.7	33.4	26.0	24.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	3.6	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	11.4	2.2	2.2	20.8	3.2	9.1	22.4	12.8
Green Ext Time (p_c), s	0.0	1.6	0.0	14.0	0.0	1.1	0.0	8.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	8	20	19	43	8	20	26	36
Maximum Split (%)	8.9%	22.2%	21.1%	47.8%	8.9%	22.2%	28.9%	40.0%
Minimum Split (s)	8	20	8	20	8	20	8	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	82	0	20	39	82	0	20	46
End Time (s)	0	20	39	82	0	20	46	82
Yield/Force Off (s)	86	16	35	78	86	16	42	78
Yield/Force Off 170(s)	86	5	35	67	86	5	42	67
Local Start Time (s)	82	0	20	39	82	0	20	46
Local Yield (s)	86	16	35	78	86	16	42	78
Local Yield 170(s)	86	5	35	67	86	5	42	67

Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	

Splits and Phases: 5: Shea Blvd & Palisades Blvd

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	70	0	2	66	0	3
Future Vol, veh/h	70	0	2	66	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	0	2	73	0	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	42	39	0	0	76	0
Stage 1	39	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	969	1033	-	-	1523	-
Stage 1	983	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	969	1033	-	-	1523	-
Mov Cap-2 Maneuver	969	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	969	1523	-
HCM Lane V/C Ratio	-	-	0.08	-	-
HCM Control Delay (s)	-	-	9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	14	10	8	0	0	18
Future Vol, veh/h	14	10	8	0	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	11	9	0	0	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	9	0	-	0	51	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	42	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1611	-	-	-	958	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	980	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1611	-	-	-	948	1073
Mov Cap-2 Maneuver	-	-	-	-	948	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	SB
HCM Control Delay, s	4.2	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1073
HCM Lane V/C Ratio	0.01	-	-	-	0.019
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX H

2023 PEAK HOUR ANALYSIS

CivTech

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	8	5	167	9	4	181
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	6	186	10	4	201

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	401	191	0	0	196	0
Stage 1	191	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	605	851	-	-	1377	-
Stage 1	841	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	603	851	-	-	1377	-
Mov Cap-2 Maneuver	603	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	679	1377	-
HCM Lane V/C Ratio	-	-	0.021	0.003	-
HCM Control Delay (s)	-	-	10.4	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	0	0	1	1	5	5	168	1	1	197	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	0	1	1	6	6	187	1	1	219	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	423	420	219	419	419	187	219	0	0	188	0	0
Stage 1	221	221	-	198	198	-	-	-	-	-	-	-
Stage 2	202	199	-	221	221	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	541	525	821	544	525	855	1350	-	-	1386	-	-
Stage 1	781	720	-	804	737	-	-	-	-	-	-	-
Stage 2	800	736	-	781	720	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	535	522	821	542	522	855	1350	-	-	1386	-	-
Mov Cap-2 Maneuver	535	522	-	542	522	-	-	-	-	-	-	-
Stage 1	778	719	-	800	734	-	-	-	-	-	-	-
Stage 2	790	733	-	780	719	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	10	0.2	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1350	-	-	535	729	1386	-	-
HCM Lane V/C Ratio	0.004	-	-	0.012	0.011	0.001	-	-
HCM Control Delay (s)	7.7	-	-	11.8	10	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South 2/15/2017

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	209	0	1	170	0	1	0	0	19	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	232	0	1	189	0	1	0	0	21	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	189	0	0	232	0	0	423	423	232	423	423	189
Stage 1	-	-	-	-	-	-	232	232	-	191	191	-
Stage 2	-	-	-	-	-	-	191	191	-	232	232	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1385	-	-	1336	-	-	541	522	807	541	522	853
Stage 1	-	-	-	-	-	-	771	713	-	811	742	-
Stage 2	-	-	-	-	-	-	811	742	-	771	713	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1385	-	-	1336	-	-	541	521	807	541	521	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	541	521	-	541	521	-
Stage 1	-	-	-	-	-	-	771	713	-	811	741	-
Stage 2	-	-	-	-	-	-	810	741	-	771	713	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.7	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	541	1385	-	-	1336	-	-	541
HCM Lane V/C Ratio	0.002	-	-	-	0.001	-	-	0.039
HCM Control Delay (s)	11.7	0	-	-	7.7	0	-	11.9
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd 2/15/2017

Intersection	
Intersection Delay, s/veh	39.5
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	70	21	114	0	42	19	26	0	87	322	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	78	23	127	0	47	21	29	0	97	358	7
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	15.1	13.5	19.6
HCM LOS	C	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	45%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	55%	100%	0%	0%	16%	0%	42%	0%	100%	83%
Vol Right, %	0%	0%	100%	0%	84%	0%	58%	0%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	194	215	6	70	135	42	45	9	599	361
LT Vol	87	0	0	70	0	42	0	9	0	0
Through Vol	107	215	0	0	21	0	19	0	599	300
RT Vol	0	0	6	0	114	0	26	0	0	61
Lane Flow Rate	216	239	7	78	150	47	50	10	666	401
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.502	0.54	0.014	0.203	0.346	0.128	0.125	0.022	1	0.818
Departure Headway (Hd)	8.372	8.148	7.448	9.382	8.305	9.881	8.989	7.979	7.468	7.348
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	432	444	481	383	434	364	400	449	493	493
Service Time	6.103	5.879	5.179	7.114	6.037	7.62	6.728	5.716	5.205	5.084
HCM Lane V/C Ratio	0.5	0.538	0.015	0.204	0.346	0.129	0.125	0.022	1.351	0.813
HCM Control Delay	19.3	20.1	10.3	14.5	15.4	14.1	13	10.9	68.3	35.4
HCM Lane LOS	C	C	B	B	C	B	B	B	F	E
HCM 95th-tile Q	2.7	3.1	0	0.7	1.5	0.4	0.4	0.1	13.4	7.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	9	899	61
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	999	68
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	55.5
HCM LOS	F

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	329	514	8	1	1138	75	14	12	14	143	5	968
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	366	571	9	1	1264	83	16	13	16	159	6	1076
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	2392	745	2	1736	611	26	233	287	564	626	1299
Arrive On Green	0.13	0.47	0.47	0.00	0.34	0.34	0.01	0.31	0.31	0.04	0.34	0.34
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	761	937	1774	1863	2787
Grp Volume(v), veh/h	366	571	9	1	1264	83	16	0	29	159	6	1076
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1697	1774	1863	1393
Q Serve(g_s), s	9.3	6.0	0.3	0.1	19.6	3.1	0.8	0.0	1.1	4.0	0.2	30.2
Cycle Q Clear(g_c), s	9.3	6.0	0.3	0.1	19.6	3.1	0.8	0.0	1.1	4.0	0.2	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	447	2392	745	2	1736	611	26	0	520	564	626	1299
V/C Ratio(X)	0.82	0.24	0.01	0.51	0.73	0.14	0.62	0.00	0.06	0.28	0.01	0.83
Avail Cap(c_a), veh/h	535	2392	745	118	1921	669	118	0	520	564	626	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	14.2	12.7	44.9	26.0	17.9	44.1	0.0	22.0	20.8	19.9	20.9
Incr Delay (d2), s/veh	8.3	0.1	0.0	128.6	1.3	0.1	21.3	0.0	0.2	0.3	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.8	0.1	0.1	9.3	1.4	0.5	0.0	0.5	1.0	0.1	12.6
LnGrp Delay(d),s/veh	46.4	14.3	12.7	173.5	27.2	18.0	65.4	0.0	22.2	21.1	19.9	27.1
LnGrp LOS	D	B	B	F	C	B	E		C	C	B	C
Approach Vol, veh/h		946			1348			45			1241	
Approach Delay, s/veh		26.7			26.8			37.6			26.3	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	31.6	4.1	46.3	5.3	34.3	15.7	34.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	3.0	3.1	2.1	8.0	2.8	32.2	11.3	21.6
Green Ext Time (p_c), s	0.0	5.2	0.0	18.6	0.0	0.0	0.4	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

HCM 2010 TWSC
6: Eagle Ridge Dr & Driveway A 2/15/2017

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	27	0	104	68	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	116	76	0	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	327	153	0	0	191	0
Stage 1	153	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	667	893	-	-	1383	-
Stage 1	875	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	667	893	-	-	1383	-
Mov Cap-2 Maneuver	667	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	667	1383	-
HCM Lane V/C Ratio	-	-	0.045	-	-
HCM Control Delay (s)	-	-	10.7	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
7: Copperwynd Dr & Driveway B 2/15/2017

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	8	5	12	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	6	13	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	13	0	-	0	36	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	23	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1606	-	-	-	977	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1000	-
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver	1606	-	-	-	971	1067
Mov Cap-2 Maneuver	-	-	-	-	971	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	994	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1606	-	-	-	1067
HCM Lane V/C Ratio	0.006	-	-	-	0.001
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	14	8	218	15	5	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	9	242	17	6	212

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	474	251	0	0	259	0
Stage 1	251	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	549	788	-	-	1306	-
Stage 1	791	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	546	788	-	-	1306	-
Mov Cap-2 Maneuver	546	-	-	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	615	1306	-
HCM Lane V/C Ratio	-	-	0.04	0.004	-
HCM Control Delay (s)	-	-	11.1	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	0	0	0	0	4	4	235	1	0	208	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	0	0	4	4	261	1	0	231	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	505	503	232	503	504	262	233	0	0	262	0	0
Stage 1	232	232	-	271	271	-	-	-	-	-	-	-
Stage 2	273	271	-	232	233	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	478	471	807	479	470	777	1335	-	-	1302	-	-
Stage 1	771	713	-	735	685	-	-	-	-	-	-	-
Stage 2	733	685	-	771	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	474	470	807	478	469	777	1335	-	-	1302	-	-
Mov Cap-2 Maneuver	474	470	-	478	469	-	-	-	-	-	-	-
Stage 1	769	713	-	733	683	-	-	-	-	-	-	-
Stage 2	727	683	-	771	712	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	9.7	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1335	-	-	474	777	1302	-	-
HCM Lane V/C Ratio	0.003	-	-	0.009	0.006	-	-	-
HCM Control Delay (s)	7.7	-	-	12.7	9.7	0	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South 2/15/2017

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	221	1	0	236	25	0	0	1	19	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	246	1	0	262	28	0	0	1	21	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	290	0	0	247	0	0	525	538	246	525	525	276
Stage 1	-	-	-	-	-	-	248	248	-	276	276	-
Stage 2	-	-	-	-	-	-	277	290	-	249	249	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1272	-	-	1319	-	-	463	450	793	463	458	763
Stage 1	-	-	-	-	-	-	756	701	-	730	682	-
Stage 2	-	-	-	-	-	-	729	672	-	755	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1272	-	-	1319	-	-	462	450	793	462	458	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	462	450	-	462	458	-
Stage 1	-	-	-	-	-	-	755	700	-	729	682	-
Stage 2	-	-	-	-	-	-	728	672	-	753	700	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.5	13
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	1272	-	-	1319	-	-	471
HCM Lane V/C Ratio	0.001	0.001	-	-	-	-	-	0.047
HCM Control Delay (s)	9.5	7.8	-	-	0	-	-	13
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd 2/15/2017

Intersection	
Intersection Delay, s/veh	48
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	101	32	92	0	24	30	19	0	141	795	43
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	112	36	102	0	27	33	21	0	157	883	48
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	16.8	14.5	68.2
HCM LOS	C	B	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	35%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	65%	100%	0%	0%	26%	0%	61%	0%	100%	73%
Vol Right, %	0%	0%	100%	0%	74%	0%	39%	0%	0%	27%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	406	530	43	101	124	24	49	14	296	204
LT Vol	141	0	0	101	0	24	0	14	0	0
Through Vol	265	530	0	0	32	0	30	0	296	148
RT Vol	0	0	43	0	92	0	19	0	0	56
Lane Flow Rate	451	589	48	112	138	27	54	16	329	227
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1	1	0.095	0.312	0.345	0.08	0.151	0.039	0.772	0.52
Departure Headway (Hd)	8.053	7.875	7.159	10.015	9.003	10.742	9.977	8.955	8.455	8.263
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	451	459	498	361	402	335	361	399	428	435
Service Time	5.828	5.65	4.933	7.721	6.708	8.457	7.691	6.723	6.223	6.031
HCM Lane V/C Ratio	1	1.283	0.096	0.31	0.343	0.081	0.15	0.04	0.769	0.522
HCM Control Delay	71.3	70.5	10.7	17.2	16.4	14.4	14.5	12.1	34.7	19.7
HCM Lane LOS	F	F	B	C	C	B	B	B	D	C
HCM 95th-tile Q	12.9	13	0.3	1.3	1.5	0.3	0.5	0.1	6.6	2.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	14	444	56
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	16	493	62
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	28.1
HCM LOS	D

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	883	1493	18	5	716	128	24	4	4	93	8	447
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	981	1659	20	6	796	142	27	4	4	103	9	497
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2436	759	11	1225	452	39	250	250	564	587	1559
Arrive On Green	0.24	0.48	0.48	0.01	0.24	0.24	0.02	0.29	0.29	0.04	0.32	0.32
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	981	1659	20	6	796	142	27	0	8	103	9	497
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	22.0	22.7	0.6	0.3	12.7	6.3	1.4	0.0	0.3	3.7	0.3	8.6
Cycle Q Clear(g_c), s	22.0	22.7	0.6	0.3	12.7	6.3	1.4	0.0	0.3	3.7	0.3	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	841	2436	759	11	1225	452	39	0	501	564	587	1559
V/C Ratio(X)	1.17	0.68	0.03	0.55	0.65	0.31	0.70	0.00	0.02	0.18	0.02	0.32
Avail Cap(c_a), veh/h	841	2436	759	296	1808	633	79	0	501	564	587	1559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	18.1	12.4	44.6	30.7	25.3	43.7	0.0	22.6	21.0	21.2	10.6
Incr Delay (d2), s/veh	87.6	0.8	0.0	36.2	0.6	0.4	20.2	0.0	0.1	0.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.6	10.8	0.3	0.3	6.0	2.8	0.9	0.0	0.1	1.8	0.2	3.4
LnGrp Delay(d),s/veh	121.6	18.9	12.4	80.8	31.3	25.6	63.9	0.0	22.7	21.1	21.3	11.2
LnGrp LOS	F	B	B	F	C	C	E		C	C	C	B
Approach Vol, veh/h		2660			944			35			609	
Approach Delay, s/veh		56.7			30.8			54.5			13.0	
Approach LOS		E			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	30.3	4.6	47.1	6.0	32.4	26.0	25.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	2.6	2.3	2.3	24.7	3.4	10.6	24.0	14.7
Green Ext Time (p_c), s	0.0	1.9	0.0	12.4	0.0	1.1	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.7
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	47	0	182	44	0	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	0	202	49	0	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	393	227	0	0	251	0
Stage 1	227	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	611	812	-	-	1314	-
Stage 1	811	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	611	812	-	-	1314	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	811	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 611	1314	-
HCM Lane V/C Ratio	-	- 0.085	-	-
HCM Control Delay (s)	-	- 11.4	0	-
HCM Lane LOS	-	- B	A	-
HCM 95th %tile Q(veh)	-	- 0.3	0	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	8	12	9	0	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	13	10	0	0	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	10	0	-	0	41	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	31	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1610	-	-	-	970	1071
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	992	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1610	-	-	-	964	1071
Mov Cap-2 Maneuver	-	-	-	-	964	-
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	986	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1610	-	-	-	1071
HCM Lane V/C Ratio	0.006	-	-	-	0.013
HCM Control Delay (s)	7.2	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	5	216	21	4	217
Future Vol, veh/h	16	5	216	21	4	217
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	6	240	23	4	241

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	502	252	0	0	263	0
Stage 1	252	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	529	787	-	-	1301	-
Stage 1	790	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	527	787	-	-	1301	-
Mov Cap-2 Maneuver	527	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	572	1301	-
HCM Lane V/C Ratio	-	-	0.041	0.003	-
HCM Control Delay (s)	-	-	11.6	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑		↰	↑	
Traffic Vol, veh/h	6	0	0	1	1	5	5	229	1	1	241	0
Future Vol, veh/h	6	0	0	1	1	5	5	229	1	1	241	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	0	1	1	6	6	254	1	1	268	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	539	537	268	536	536	255	268	0	0	256	0	0
Stage 1	270	270	-	266	266	-	-	-	-	-	-	-
Stage 2	269	267	-	270	270	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	453	450	771	455	451	784	1296	-	-	1309	-	-
Stage 1	736	686	-	739	689	-	-	-	-	-	-	-
Stage 2	737	688	-	736	686	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	447	448	771	453	449	784	1296	-	-	1309	-	-
Mov Cap-2 Maneuver	447	448	-	453	449	-	-	-	-	-	-	-
Stage 1	733	685	-	736	686	-	-	-	-	-	-	-
Stage 2	727	685	-	735	685	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	10.6	0.2	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1296	-	-	447	647	1309	-	-
HCM Lane V/C Ratio	0.004	-	-	0.015	0.012	0.001	-	-
HCM Control Delay (s)	7.8	-	-	13.2	10.6	7.8	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	253	0	1	231	0	1	0	0	19	0	0
Future Vol, veh/h	0	253	0	1	231	0	1	0	0	19	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	281	0	1	257	0	1	0	0	21	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	257	0	0	281	0	0	540	540	281	540	540	257
Stage 1	-	-	-	-	-	-	281	281	-	259	259	-
Stage 2	-	-	-	-	-	-	259	259	-	281	281	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1308	-	-	1282	-	-	453	449	758	453	449	782
Stage 1	-	-	-	-	-	-	726	678	-	746	694	-
Stage 2	-	-	-	-	-	-	746	694	-	726	678	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1308	-	-	1282	-	-	453	449	758	453	449	782
Mov Cap-2 Maneuver	-	-	-	-	-	-	453	449	-	453	449	-
Stage 1	-	-	-	-	-	-	726	678	-	746	693	-
Stage 2	-	-	-	-	-	-	745	693	-	726	678	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13	13.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	453	1308	-	-	1282	-	-	453
HCM Lane V/C Ratio	0.002	-	-	-	0.001	-	-	0.047
HCM Control Delay (s)	13	0	-	-	7.8	-	-	13.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	101.7
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	74	21	154	0	42	19	26	0	142	322	6
Future Vol, veh/h	0	74	21	154	0	42	19	26	0	142	322	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	82	23	171	0	47	21	29	0	158	358	7
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	18.3	14.8	25.8
HCM LOS	C	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	57%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	43%	100%	0%	0%	12%	0%	42%	0%	100%	82%
Vol Right, %	0%	0%	100%	0%	88%	0%	58%	0%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	249	215	6	74	175	42	45	9	599	367
LT Vol	142	0	0	74	0	42	0	9	0	0
Through Vol	107	215	0	0	21	0	19	0	599	300
RT Vol	0	0	6	0	154	0	26	0	0	67
Lane Flow Rate	277	239	7	82	194	47	50	10	666	407
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.672	0.56	0.014	0.221	0.462	0.134	0.132	0.023	1.468	0.883
Departure Headway (Hd)	9.283	8.99	8.27	10.196	9.063	10.981	10.055	8.448	7.936	7.805
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	391	403	435	354	401	329	359	424	459	464
Service Time	6.983	6.69	5.97	7.896	6.763	8.681	7.755	6.198	5.685	5.554
HCM Lane V/C Ratio	0.708	0.593	0.016	0.232	0.484	0.143	0.139	0.024	1.451	0.877
HCM Control Delay	29	22.5	11.1	15.8	19.3	15.4	14.3	11.4	243.9	46
HCM Lane LOS	D	C	B	C	C	C	B	B	F	E
HCM 95th-tile Q	4.7	3.3	0	0.8	2.4	0.5	0.5	0.1	33.7	9.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	9	899	67
Future Vol, veh/h	0	9	899	67
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	999	74
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	167.3
HCM LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	21	154	42	19	26	142	322	6	9	899	67
Future Volume (veh/h)	74	21	154	42	19	26	142	322	6	9	899	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	82	23	171	47	21	29	158	358	7	10	999	74
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	378	39	288	248	144	199	201	1776	795	18	1333	99
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.11	0.50	0.50	0.01	0.40	0.40
Sat Flow, veh/h	1349	191	1421	1184	710	980	1774	3539	1583	1774	3341	247
Grp Volume(v), veh/h	82	0	194	47	0	50	158	358	7	10	529	544
Grp Sat Flow(s),veh/h/ln	1349	0	1612	1184	0	1690	1774	1770	1583	1774	1770	1819
Q Serve(g_s), s	2.8	0.0	5.7	2.0	0.0	1.3	4.6	3.0	0.1	0.3	13.5	13.5
Cycle Q Clear(g_c), s	4.1	0.0	5.7	7.7	0.0	1.3	4.6	3.0	0.1	0.3	13.5	13.5
Prop In Lane	1.00		0.88	1.00		0.58	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	378	0	327	248	0	343	201	1776	795	18	706	726
V/C Ratio(X)	0.22	0.00	0.59	0.19	0.00	0.15	0.79	0.20	0.01	0.55	0.75	0.75
Avail Cap(c_a), veh/h	514	0	490	368	0	514	270	1776	795	135	706	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	19.0	22.5	0.0	17.2	22.7	7.3	6.6	25.9	13.6	13.6
Incr Delay (d2), s/veh	0.3	0.0	1.7	0.4	0.0	0.2	10.4	0.3	0.0	22.9	7.2	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	2.7	0.7	0.0	0.6	2.8	1.5	0.1	0.3	7.9	8.1
LnGrp Delay(d),s/veh	19.2	0.0	20.7	22.9	0.0	17.4	33.1	7.5	6.6	48.8	20.7	20.6
LnGrp LOS	B		C	C		B	C	A	A	D	C	C
Approach Vol, veh/h		276			97			523			1083	
Approach Delay, s/veh		20.3			20.1			15.3			20.9	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	31.4		15.7	11.0	26.0		15.7
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0		16.0	8.0	21.0		16.0
Max Q Clear Time (g_c+I1), s	2.3	5.0		7.7	6.6	15.5		9.7
Green Ext Time (p_c), s	0.0	9.8		1.2	0.1	3.9		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max	None
Maximum Split (s)	9	30	21	13	26	21
Maximum Split (%)	15.0%	50.0%	35.0%	21.7%	43.3%	35.0%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	13	39
End Time (s)	9	39	0	13	39	0
Yield/Force Off (s)	4	34	55	8	34	55
Yield/Force Off 170(s)	4	23	44	8	23	44
Local Start Time (s)	47	56	26	47	0	26
Local Yield (s)	51	21	42	55	21	42
Local Yield 170(s)	51	10	31	55	10	31

Intersection Summary	
Cycle Length	60
Control Type	Semi Act-Uncoord
Natural Cycle	60

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	21	154	42	19	26	142	322	6	9	899	67
Future Volume (veh/h)	74	21	154	42	19	26	142	322	6	9	899	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	82	23	171	47	21	29	158	358	7	10	999	74
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	327	299	254	323	114	157	202	1864	834	18	1415	105
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.11	0.53	0.53	0.01	0.42	0.42
Sat Flow, veh/h	1349	1863	1583	1184	710	980	1774	3539	1583	1774	3341	247
Grp Volume(v), veh/h	82	23	171	47	0	50	158	358	7	10	529	544
Grp Sat Flow(s),veh/h/ln	1349	1863	1583	1184	0	1690	1774	1770	1583	1774	1770	1819
Q Serve(g_s), s	2.8	0.5	5.0	1.7	0.0	1.3	4.3	2.6	0.1	0.3	12.2	12.2
Cycle Q Clear(g_c), s	4.0	0.5	5.0	2.3	0.0	1.3	4.3	2.6	0.1	0.3	12.2	12.2
Prop In Lane	1.00		1.00	1.00		0.58	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	327	299	254	323	0	271	202	1864	834	18	749	770
V/C Ratio(X)	0.25	0.08	0.67	0.15	0.00	0.18	0.78	0.19	0.01	0.54	0.71	0.71
Avail Cap(c_a), veh/h	546	601	511	515	0	545	286	1864	834	143	749	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	17.7	19.6	18.7	0.0	18.0	21.4	6.2	5.6	24.4	11.8	11.8
Incr Delay (d2), s/veh	0.4	0.1	3.1	0.2	0.0	0.3	8.8	0.2	0.0	22.6	5.5	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.3	2.4	0.6	0.0	0.6	2.6	1.4	0.0	0.2	7.0	7.2
LnGrp Delay(d),s/veh	20.2	17.8	22.7	18.9	0.0	18.3	30.2	6.4	5.6	47.0	17.3	17.2
LnGrp LOS	C	B	C	B		B	C	A	A	D	B	B
Approach Vol, veh/h		276			97			523			1083	
Approach Delay, s/veh		21.5			18.6			13.6			17.5	
Approach LOS		C			B			B			B	

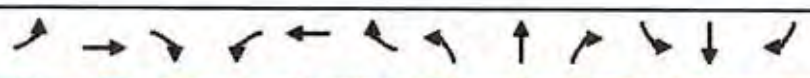
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	31.1		13.0	10.6	26.0		13.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0		16.0	8.0	21.0		16.0
Max Q Clear Time (g_c+I1), s	2.3	4.6		7.0	6.3	14.2		4.3
Green Ext Time (p_c), s	0.0	9.9		1.0	0.1	4.6		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max	None
Maximum Split (s)	9	30	21	13	26	21
Maximum Split (%)	15.0%	50.0%	35.0%	21.7%	43.3%	35.0%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	13	39
End Time (s)	9	39	0	13	39	0
Yield/Force Off (s)	4	34	55	8	34	55
Yield/Force Off 170(s)	4	23	44	8	23	44
Local Start Time (s)	47	56	26	47	0	26
Local Yield (s)	51	21	42	55	21	42
Local Yield 170(s)	51	10	31	55	10	31

Intersection Summary	
Cycle Length	60
Control Type	Semi Act-Uncoord
Natural Cycle	60

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	514	8	1	1138	99	14	12	14	161	5	990
Future Volume (veh/h)	360	514	8	1	1138	99	14	12	14	161	5	990
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	400	571	9	1	1264	110	16	13	16	179	6	1100
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	478	2426	755	2	1726	608	26	228	281	554	613	1304
Arrive On Green	0.14	0.48	0.48	0.00	0.34	0.34	0.01	0.30	0.30	0.04	0.33	0.33
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	761	937	1774	1863	2787
Grp Volume(v), veh/h	400	571	9	1	1264	110	16	0	29	179	6	1100
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1697	1774	1863	1393
Q Serve(g_s), s	10.2	6.0	0.3	0.1	19.7	4.1	0.8	0.0	1.1	4.0	0.2	29.6
Cycle Q Clear(g_c), s	10.2	6.0	0.3	0.1	19.7	4.1	0.8	0.0	1.1	4.0	0.2	29.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	478	2426	755	2	1726	608	26	0	508	554	613	1304
V/C Ratio(X)	0.84	0.24	0.01	0.51	0.73	0.18	0.62	0.00	0.06	0.32	0.01	0.84
Avail Cap(c_a), veh/h	535	2426	755	118	1921	669	118	0	508	554	613	1304
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	13.9	12.4	44.9	26.1	18.4	44.1	0.0	22.5	21.7	20.3	21.0
Incr Delay (d2), s/veh	10.3	0.0	0.0	128.6	1.3	0.1	21.3	0.0	0.2	0.3	0.0	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.8	0.1	0.1	9.3	1.8	0.5	0.0	0.5	1.4	0.1	13.1
LnGrp Delay(d),s/veh	48.0	13.9	12.4	173.5	27.4	18.5	65.4	0.0	22.7	22.0	20.3	27.8
LnGrp LOS	D	B	B	F	C	B	E		C	C	C	C
Approach Vol, veh/h		980			1375			45			1285	
Approach Delay, s/veh		27.8			26.8			37.9			27.0	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	31.0	4.1	46.9	5.3	33.6	16.5	34.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	6.0	3.1	2.1	8.0	2.8	31.6	12.2	21.7
Green Ext Time (p_c), s	0.0	5.3	0.0	18.8	0.0	0.0	0.3	8.9

Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	63	0	104	117	0	157
Future Vol, veh/h	63	0	104	117	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	0	116	130	0	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	355	181	0	0	246	0
Stage 1	181	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	643	862	-	-	1320	-
Stage 1	850	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	643	862	-	-	1320	-
Mov Cap-2 Maneuver	643	-	-	-	-	-
Stage 1	850	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	643	1320	-
HCM Lane V/C Ratio	-	-	0.109	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	5	12	0	0	9
Future Vol, veh/h	20	5	12	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	6	13	0	0	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	13	0	-	0	63	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1606	-	-	-	943	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1606	-	-	-	930	1067
Mov Cap-2 Maneuver	-	-	-	-	930	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1606	-	-	-	1067
HCM Lane V/C Ratio	0.014	-	-	-	0.009
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	8	264	26	5	239
Future Vol, veh/h	25	8	264	26	5	239
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	9	293	29	6	266

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	585	308	0	0	322	0
Stage 1	308	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	473	732	-	-	1238	-
Stage 1	745	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	471	732	-	-	1238	-
Mov Cap-2 Maneuver	471	-	-	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	766	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	516	1238	-
HCM Lane V/C Ratio	-	-	0.071	0.004	-
HCM Control Delay (s)	-	-	12.5	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	4	0	0	0	0	4	4	292	1	0	267	2
Future Vol, veh/h	4	0	0	0	0	4	4	292	1	0	267	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	0	0	4	4	324	1	0	297	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	634	632	298	632	633	325	299	0	0	326	0	0
Stage 1	298	298	-	334	334	-	-	-	-	-	-	-
Stage 2	336	334	-	298	299	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	392	398	741	393	397	716	1262	-	-	1234	-	-
Stage 1	711	667	-	680	643	-	-	-	-	-	-	-
Stage 2	678	643	-	711	666	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	389	397	741	392	396	716	1262	-	-	1234	-	-
Mov Cap-2 Maneuver	389	397	-	392	396	-	-	-	-	-	-	-
Stage 1	709	667	-	678	641	-	-	-	-	-	-	-
Stage 2	672	641	-	711	666	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	10.1	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1262	-	-	389	716	1234	-	-
HCM Lane V/C Ratio	0.004	-	-	0.011	0.006	-	-	-
HCM Control Delay (s)	7.9	-	-	14.4	10.1	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	280	1	0	293	25	0	0	1	19	0	1
Future Vol, veh/h	1	280	1	0	293	25	0	0	1	19	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	311	1	0	326	28	0	0	1	21	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	353	0	0	-	-	0	654	667	312	653	653	339
Stage 1	-	-	-	-	-	-	314	314	-	339	339	-
Stage 2	-	-	-	-	-	-	340	353	-	314	314	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1206	-	-	0	-	-	380	380	728	380	387	703
Stage 1	-	-	-	0	-	-	697	656	-	676	640	-
Stage 2	-	-	-	0	-	-	675	631	-	697	656	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1206	-	-	-	-	-	379	380	728	379	387	703
Mov Cap-2 Maneuver	-	-	-	-	-	-	379	380	-	379	387	-
Stage 1	-	-	-	-	-	-	696	655	-	675	640	-
Stage 2	-	-	-	-	-	-	674	631	-	695	655	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10	14.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	728	1206	-	-	-	-	388
HCM Lane V/C Ratio	0.002	0.001	-	-	-	-	0.057
HCM Control Delay (s)	10	8	-	-	-	-	14.8
HCM Lane LOS	B	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	-	-	0.2

Intersection	
Intersection Delay, s/veh	100.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	107	32	145	0	24	30	19	0	192	795	43
Future Vol, veh/h	0	107	32	145	0	24	30	19	0	192	795	43
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	119	36	161	0	27	33	21	0	213	883	48
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	20	15.4	162.6
HCM LOS	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	42%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	58%	100%	0%	0%	18%	0%	61%	0%	100%	70%
Vol Right, %	0%	0%	100%	0%	82%	0%	39%	0%	0%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	457	530	43	107	177	24	49	14	296	210
LT Vol	192	0	0	107	0	24	0	14	0	0
Through Vol	265	530	0	0	32	0	30	0	296	148
RT Vol	0	0	43	0	145	0	19	0	0	62
Lane Flow Rate	508	589	48	119	197	27	54	16	329	233
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1.198	1.353	0.1	0.333	0.493	0.082	0.156	0.04	0.804	0.557
Departure Headway (Hd)	8.49	8.274	7.555	10.556	9.468	11.577	10.787	9.815	9.301	9.088
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	432	442	474	342	383	311	334	367	391	399
Service Time	6.237	6.021	5.301	8.256	7.168	9.277	8.487	7.515	7.001	6.788
HCM Lane V/C Ratio	1.176	1.333	0.101	0.348	0.514	0.087	0.162	0.044	0.841	0.584
HCM Control Delay	136.9	197.1	11.1	18.4	21	15.3	15.5	12.9	40.8	22.6
HCM Lane LOS	F	F	B	C	C	C	C	B	E	C
HCM 95th-tile Q	19.9	27.2	0.3	1.4	2.6	0.3	0.5	0.1	7.1	3.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	14	444	62
Future Vol, veh/h	0	14	444	62
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	16	493	69
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	32.7
HCM LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	32	145	24	30	19	192	795	43	14	444	62
Future Volume (veh/h)	107	32	145	24	30	19	192	795	43	14	444	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	119	36	161	27	33	21	213	883	48	16	493	69
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	58	259	241	207	132	270	1747	782	28	1115	155
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.15	0.49	0.49	0.02	0.36	0.36
Sat Flow, veh/h	1345	297	1330	1181	1065	678	1774	3539	1583	1774	3121	435
Grp Volume(v), veh/h	119	0	197	27	0	54	213	883	48	16	279	283
Grp Sat Flow(s),veh/h/ln	1345	0	1628	1181	0	1743	1774	1770	1583	1774	1770	1786
Q Serve(g_s), s	4.1	0.0	5.6	1.1	0.0	1.3	5.9	8.5	0.8	0.5	6.1	6.1
Cycle Q Clear(g_c), s	5.4	0.0	5.6	6.7	0.0	1.3	5.9	8.5	0.8	0.5	6.1	6.1
Prop In Lane	1.00		0.82	1.00		0.39	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	369	0	316	241	0	339	270	1747	782	28	632	638
V/C Ratio(X)	0.32	0.00	0.62	0.11	0.00	0.16	0.79	0.51	0.06	0.57	0.44	0.44
Avail Cap(c_a), veh/h	532	0	514	384	0	551	455	1747	782	140	632	638
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	18.7	21.8	0.0	17.0	20.7	8.7	6.7	24.7	12.4	12.4
Incr Delay (d2), s/veh	0.5	0.0	2.0	0.2	0.0	0.2	5.1	1.0	0.2	16.6	2.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	2.7	0.4	0.0	0.7	3.2	4.3	0.4	0.3	3.3	3.4
LnGrp Delay(d),s/veh	19.7	0.0	20.7	22.0	0.0	17.2	25.8	9.7	6.8	41.3	14.6	14.7
LnGrp LOS	B		C	C		B	C	A	A	D	B	B
Approach Vol, veh/h		316			81			1144			578	
Approach Delay, s/veh		20.3			18.8			12.6			15.4	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	30.0		14.8	12.7	23.1		14.8
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0		16.0	13.0	16.0		16.0
Max Q Clear Time (g_c+I1), s	2.5	10.5		7.6	7.9	8.1		8.7
Green Ext Time (p_c), s	0.0	8.3		1.3	0.3	5.3		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max	None
Maximum Split (s)	9	30	21	18	21	21
Maximum Split (%)	15.0%	50.0%	35.0%	30.0%	35.0%	35.0%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	18	39
End Time (s)	9	39	0	18	39	0
Yield/Force Off (s)	4	34	55	13	34	55
Yield/Force Off 170(s)	4	23	44	13	23	44
Local Start Time (s)	42	51	21	42	0	21
Local Yield (s)	46	16	37	55	16	37
Local Yield 170(s)	46	5	26	55	5	26

Intersection Summary	
Cycle Length	60
Control Type	Semi Act-Uncoord
Natural Cycle	55

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	32	145	24	30	19	192	795	43	14	444	62
Future Volume (veh/h)	107	32	145	24	30	19	192	795	43	14	444	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	119	36	161	27	33	21	213	883	48	16	493	69
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	317	270	328	181	115	271	1800	805	28	1160	162
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.15	0.51	0.51	0.02	0.37	0.37
Sat Flow, veh/h	1345	1863	1583	1181	1065	678	1774	3539	1583	1774	3121	435
Grp Volume(v), veh/h	119	36	161	27	0	54	213	883	48	16	279	283
Grp Sat Flow(s),veh/h/ln	1345	1863	1583	1181	0	1743	1774	1770	1583	1774	1770	1786
Q Serve(g_s), s	4.1	0.8	4.6	1.0	0.0	1.3	5.7	8.0	0.8	0.4	5.8	5.8
Cycle Q Clear(g_c), s	5.4	0.8	4.6	1.8	0.0	1.3	5.7	8.0	0.8	0.4	5.8	5.8
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	340	317	270	328	0	297	271	1800	805	28	658	664
V/C Ratio(X)	0.35	0.11	0.60	0.08	0.00	0.18	0.78	0.49	0.06	0.56	0.42	0.43
Avail Cap(c_a), veh/h	548	606	515	512	0	567	469	1800	805	144	658	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	17.3	18.8	18.0	0.0	17.5	20.0	7.9	6.1	24.0	11.5	11.5
Incr Delay (d2), s/veh	0.6	0.2	2.1	0.1	0.0	0.3	5.0	1.0	0.1	16.4	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.4	2.2	0.3	0.0	0.7	3.2	4.0	0.4	0.3	3.2	3.2
LnGrp Delay(d),s/veh	20.4	17.4	21.0	18.1	0.0	17.8	25.0	8.9	6.3	40.4	13.5	13.5
LnGrp LOS	C	B	C	B		B	C	A	A	D	B	B
Approach Vol, veh/h		316			81			1144			578	
Approach Delay, s/veh		20.3			17.9			11.8			14.3	
Approach LOS		C			B			B			B	

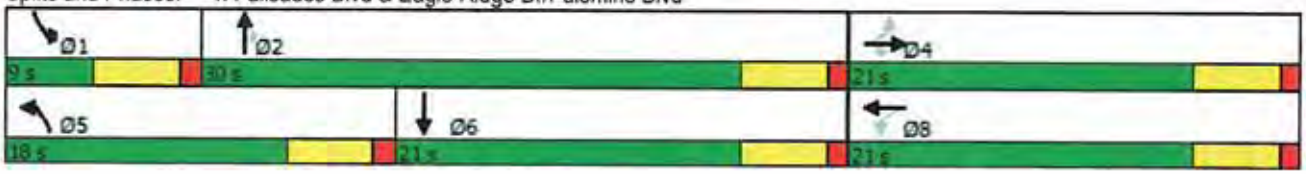
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	30.0		13.4	12.5	23.3		13.4
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0		16.0	13.0	16.0		16.0
Max Q Clear Time (g_c+I1), s	2.4	10.0		7.4	7.7	7.8		3.8
Green Ext Time (p_c), s	0.0	8.5		1.0	0.3	5.5		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max	None
Maximum Split (s)	9	30	21	18	21	21
Maximum Split (%)	15.0%	50.0%	35.0%	30.0%	35.0%	35.0%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	18	39
End Time (s)	9	39	0	18	39	0
Yield/Force Off (s)	4	34	55	13	34	55
Yield/Force Off 170(s)	4	23	44	13	23	44
Local Start Time (s)	42	51	21	42	0	21
Local Yield (s)	46	16	37	55	16	37
Local Yield 170(s)	46	5	26	55	5	26

Intersection Summary	
Cycle Length	60
Control Type	Semi Act-Uncoord
Natural Cycle	55

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	912	1493	18	5	716	151	24	4	4	117	8	477
Future Volume (veh/h)	912	1493	18	5	716	151	24	4	4	117	8	477
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1013	1659	20	6	796	168	27	4	4	130	9	530
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2441	760	11	1230	453	39	249	249	563	585	1557
Arrive On Green	0.24	0.48	0.48	0.01	0.24	0.24	0.02	0.29	0.29	0.04	0.31	0.31
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	1013	1659	20	6	796	168	27	0	8	130	9	530
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	22.0	22.7	0.6	0.3	12.7	7.6	1.4	0.0	0.3	4.0	0.3	9.3
Cycle Q Clear(g_c), s	22.0	22.7	0.6	0.3	12.7	7.6	1.4	0.0	0.3	4.0	0.3	9.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	841	2441	760	11	1230	453	39	0	499	563	585	1557
V/C Ratio(X)	1.20	0.68	0.03	0.55	0.65	0.37	0.70	0.00	0.02	0.23	0.02	0.34
Avail Cap(c_a), veh/h	841	2441	760	296	1808	633	79	0	499	563	585	1557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	18.1	12.3	44.6	30.7	25.6	43.7	0.0	22.7	21.4	21.3	10.8
Incr Delay (d2), s/veh	103.1	0.8	0.0	36.2	0.6	0.5	20.2	0.0	0.1	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.4	10.6	0.3	0.3	6.0	3.4	0.9	0.0	0.2	0.4	0.2	3.7
LnGrp Delay(d),s/veh	137.1	18.8	12.3	80.8	31.2	26.1	63.9	0.0	22.8	21.6	21.3	11.4
LnGrp LOS	F	B	B	F	C	C	E		C	C	C	B
Approach Vol, veh/h		2692			970			35			669	
Approach Delay, s/veh		63.3			30.7			54.5			13.5	
Approach LOS		E			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	30.2	4.6	47.2	6.0	32.3	26.0	25.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	16.0	2.3	2.3	24.7	3.4	11.3	24.0	14.7
Green Ext Time (p_c), s	0.0	2.0	0.0	12.5	0.0	1.1	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	48.3
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	95	0	182	90	0	149
Future Vol, veh/h	95	0	182	90	0	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	106	0	202	100	0	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	418	252	0	0	302	0
Stage 1	252	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	591	787	-	-	1259	-
Stage 1	790	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	591	787	-	-	1259	-
Mov Cap-2 Maneuver	591	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	591	1259	-
HCM Lane V/C Ratio	-	-	0.179	-	-
HCM Control Delay (s)	-	-	12.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	19	12	9	0	0	24
Future Vol, veh/h	19	12	9	0	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	13	10	0	0	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	10	0	-	0	66	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	56	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1610	-	-	-	939	1071
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	967	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1610	-	-	-	927	1071
Mov Cap-2 Maneuver	-	-	-	-	927	-
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	954	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1610	-	-	-	1071
HCM Lane V/C Ratio	0.013	-	-	-	0.025
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX I

2028 PEAK HOUR ANALYSIS

CivTech

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr

2/15/2017

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	8	5	167	9	4	181
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	6	186	10	4	201

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	401	191	0	0	196	0
Stage 1	191	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	605	851	-	-	1377	-
Stage 1	841	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	603	851	-	-	1377	-
Mov Cap-2 Maneuver	603	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	679	1377	-
HCM Lane V/C Ratio	-	-	0.021	0.003	-
HCM Control Delay (s)	-	-	10.4	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North

2/15/2017

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	0	0	1	1	5	5	168	1	1	197	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	0	1	1	6	6	187	1	1	219	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	423	420	219	419	419	187	219	0	0	188	0	0
Stage 1	221	221	-	198	198	-	-	-	-	-	-	-
Stage 2	202	199	-	221	221	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	541	525	821	544	525	855	1350	-	-	1386	-	-
Stage 1	781	720	-	804	737	-	-	-	-	-	-	-
Stage 2	800	736	-	781	720	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	535	522	821	542	522	855	1350	-	-	1386	-	-
Mov Cap-2 Maneuver	535	522	-	542	522	-	-	-	-	-	-	-
Stage 1	778	719	-	800	734	-	-	-	-	-	-	-
Stage 2	790	733	-	780	719	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	10	0.2	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1350	-	-	535	729	1386	-	-
HCM Lane V/C Ratio	0.004	-	-	0.012	0.011	0.001	-	-
HCM Control Delay (s)	7.7	-	-	11.8	10	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South 2/15/2017

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	209	0	1	170	0	1	0	0	19	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	232	0	1	189	0	1	0	0	21	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	189	0	0	232	0	0	423	423	232	423	423	189
Stage 1	-	-	-	-	-	-	232	232	-	191	191	-
Stage 2	-	-	-	-	-	-	191	191	-	232	232	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1385	-	-	1336	-	-	541	522	807	541	522	853
Stage 1	-	-	-	-	-	-	771	713	-	811	742	-
Stage 2	-	-	-	-	-	-	811	742	-	771	713	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1385	-	-	1336	-	-	541	521	807	541	521	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	541	521	-	541	521	-
Stage 1	-	-	-	-	-	-	771	713	-	811	741	-
Stage 2	-	-	-	-	-	-	810	741	-	771	713	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.7	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	541	1385	-	-	1336	-	-	541
HCM Lane V/C Ratio	0.002	-	-	-	0.001	-	-	0.039
HCM Control Delay (s)	11.7	0	-	-	7.7	0	-	11.9
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd 2/15/2017

Intersection	
Intersection Delay, s/veh	39.5
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	70	21	114	0	42	19	26	0	87	322	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	78	23	127	0	47	21	29	0	97	358	7
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	15.1	13.5	19.6
HCM LOS	C	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	45%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	55%	100%	0%	0%	16%	0%	42%	0%	100%	83%
Vol Right, %	0%	0%	100%	0%	84%	0%	58%	0%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	194	215	6	70	135	42	45	9	599	361
LT Vol	87	0	0	70	0	42	0	9	0	0
Through Vol	107	215	0	0	21	0	19	0	599	300
RT Vol	0	0	6	0	114	0	26	0	0	61
Lane Flow Rate	216	239	7	78	150	47	50	10	666	401
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.502	0.54	0.014	0.203	0.346	0.128	0.125	0.022	1	0.818
Departure Headway (Hd)	8.372	8.148	7.448	9.382	8.305	9.881	8.989	7.979	7.468	7.348
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	432	444	481	383	434	364	400	449	493	493
Service Time	6.103	5.879	5.179	7.114	6.037	7.62	6.728	5.716	5.205	5.084
HCM Lane V/C Ratio	0.5	0.538	0.015	0.204	0.346	0.129	0.125	0.022	1.351	0.813
HCM Control Delay	19.3	20.1	10.3	14.5	15.4	14.1	13	10.9	68.3	35.4
HCM Lane LOS	C	C	B	B	C	B	B	B	F	E
HCM 95th-tile Q	2.7	3.1	0	0.7	1.5	0.4	0.4	0.1	13.4	7.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	9	899	61
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	999	68
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	55.5
HCM LOS	F

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	329	514	8	1	1138	75	14	12	14	143	5	968
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	366	571	9	1	1264	83	16	13	16	159	6	1076
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	2392	745	2	1736	611	26	233	287	564	626	1299
Arrive On Green	0.13	0.47	0.47	0.00	0.34	0.34	0.01	0.31	0.31	0.04	0.34	0.34
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	761	937	1774	1863	2787
Grp Volume(v), veh/h	366	571	9	1	1264	83	16	0	29	159	6	1076
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1697	1774	1863	1393
Q Serve(g_s), s	9.3	6.0	0.3	0.1	19.6	3.1	0.8	0.0	1.1	4.0	0.2	30.2
Cycle Q Clear(g_c), s	9.3	6.0	0.3	0.1	19.6	3.1	0.8	0.0	1.1	4.0	0.2	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	447	2392	745	2	1736	611	26	0	520	564	626	1299
V/C Ratio(X)	0.82	0.24	0.01	0.51	0.73	0.14	0.62	0.00	0.06	0.28	0.01	0.83
Avail Cap(c_a), veh/h	535	2392	745	118	1921	669	118	0	520	564	626	1299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	14.2	12.7	44.9	26.0	17.9	44.1	0.0	22.0	20.8	19.9	20.9
Incr Delay (d2), s/veh	8.3	0.1	0.0	128.6	1.3	0.1	21.3	0.0	0.2	0.3	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.8	0.1	0.1	9.3	1.4	0.5	0.0	0.5	1.0	0.1	12.6
LnGrp Delay(d),s/veh	46.4	14.3	12.7	173.5	27.2	18.0	65.4	0.0	22.2	21.1	19.9	27.1
LnGrp LOS	D	B	B	F	C	B	E		C	C	B	C
Approach Vol, veh/h		946			1348			45			1241	
Approach Delay, s/veh		26.7			26.8			37.6			26.3	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	31.6	4.1	46.3	5.3	34.3	15.7	34.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	3.0	3.1	2.1	8.0	2.8	32.2	11.3	21.6
Green Ext Time (p_c), s	0.0	5.2	0.0	18.6	0.0	0.0	0.4	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	27	0	104	68	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	116	76	0	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	327	153	0	0	191	0
Stage 1	153	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	667	893	-	-	1383	-
Stage 1	875	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	667	893	-	-	1383	-
Mov Cap-2 Maneuver	667	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 667	1383	-
HCM Lane V/C Ratio	-	- 0.045	-	-
HCM Control Delay (s)	-	- 10.7	0	-
HCM Lane LOS	-	- B	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	8	5	12	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	6	13	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	13	0	-	0	36	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	23	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1606	-	-	-	977	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1000	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1606	-	-	-	971	1067
Mov Cap-2 Maneuver	-	-	-	-	971	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	994	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1606	-	-	-	1067
HCM Lane V/C Ratio	0.006	-	-	-	0.001
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 TWSC
1: Eagle Ridge Dr & Copperwynd Dr 2/15/2017

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	16	10	224	18	5	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	11	249	20	6	220

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	490	259	0	0	269	0
Stage 1	259	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	537	780	-	-	1295	-
Stage 1	784	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	535	780	-	-	1295	-
Mov Cap-2 Maneuver	535	-	-	-	-	-
Stage 1	784	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	609	1295	-
HCM Lane V/C Ratio	-	-	0.047	0.004	-
HCM Control Delay (s)	-	-	11.2	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
2: Eagle Ridge Dr & Cloud Crest Dr/Summit Dr North 2/15/2017

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	0	0	0	0	4	4	243	1	0	218	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	0	0	4	4	270	1	0	242	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	526	524	244	523	525	271	246	0	0	271	0	0
Stage 1	244	244	-	279	279	-	-	-	-	-	-	-
Stage 2	282	280	-	244	246	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	462	458	795	465	458	768	1320	-	-	1292	-	-
Stage 1	760	704	-	728	680	-	-	-	-	-	-	-
Stage 2	725	679	-	760	703	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	458	457	795	464	457	768	1320	-	-	1292	-	-
Mov Cap-2 Maneuver	458	457	-	464	457	-	-	-	-	-	-	-
Stage 1	758	704	-	726	678	-	-	-	-	-	-	-
Stage 2	719	677	-	760	703	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	9.7	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1320	-	-	458	768	1292	-	-
HCM Lane V/C Ratio	0.003	-	-	0.01	0.006	-	-	-
HCM Control Delay (s)	7.7	-	-	12.9	9.7	0	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC
3: Eagle Ridge Dr & Summit Dr South

2/15/2017

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	233	1	0	244	29	0	0	1	22	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	259	1	0	271	32	0	0	1	24	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	303	0	0	260	0	0	550	565	259	549	549	287
Stage 1	-	-	-	-	-	-	262	262	-	287	287	-
Stage 2	-	-	-	-	-	-	288	303	-	262	262	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1258	-	-	1304	-	-	446	434	780	446	443	752
Stage 1	-	-	-	-	-	-	743	691	-	720	674	-
Stage 2	-	-	-	-	-	-	720	664	-	743	691	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1258	-	-	1304	-	-	445	434	780	445	443	752
Mov Cap-2 Maneuver	-	-	-	-	-	-	445	434	-	445	443	-
Stage 1	-	-	-	-	-	-	742	690	-	719	674	-
Stage 2	-	-	-	-	-	-	719	664	-	741	690	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.6	13.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	780	1258	-	-	1304	-	-	453
HCM Lane V/C Ratio	0.001	0.001	-	-	-	-	-	0.056
HCM Control Delay (s)	9.6	7.9	-	-	0	-	-	13.4
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

HCM 2010 AWSC
4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd

2/15/2017

Intersection	
Intersection Delay, s/veh	53.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	106	33	97	0	27	30	22	0	145	918	49
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	118	37	108	0	30	33	24	0	161	1020	54
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	17.9	15.1	69.9
HCM LOS	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	32%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	68%	100%	0%	0%	25%	0%	58%	0%	100%	74%
Vol Right, %	0%	0%	100%	0%	75%	0%	42%	0%	0%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	451	612	49	106	130	27	52	16	341	231
LT Vol	145	0	0	106	0	27	0	16	0	0
Through Vol	306	612	0	0	33	0	30	0	341	171
RT Vol	0	0	49	0	97	0	22	0	0	60
Lane Flow Rate	501	680	54	118	144	30	58	18	379	256
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1	1	0.114	0.338	0.374	0.093	0.166	0.045	0.912	0.603
Departure Headway (Hd)	8.447	8.282	7.564	10.34	9.325	11.104	10.314	9.157	8.657	8.475
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	431	442	474	349	387	323	348	392	421	428
Service Time	6.197	6.032	5.313	8.079	7.063	8.851	8.061	6.888	6.388	6.206
HCM Lane V/C Ratio	1.162	1.538	0.114	0.338	0.372	0.093	0.167	0.046	0.9	0.598
HCM Control Delay	73	72.3	11.3	18.3	17.5	15	15.1	12.3	54.5	23.3
HCM Lane LOS	F	F	B	C	C	B	C	B	F	C
HCM 95th-tile Q	12.6	12.7	0.4	1.5	1.7	0.3	0.6	0.1	9.8	3.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	16	512	60
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	18	569	67
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	41.1
HCM LOS	E

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1007	1723	21	5	826	142	27	4	4	101	10	512
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1119	1914	23	6	918	158	30	4	4	112	11	569
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2460	766	11	1248	459	42	246	246	558	575	1542
Arrive On Green	0.24	0.48	0.48	0.01	0.25	0.25	0.02	0.29	0.29	0.04	0.31	0.31
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	1119	1914	23	6	918	158	30	0	8	112	11	569
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	22.0	28.0	0.7	0.3	15.0	7.1	1.5	0.0	0.3	4.0	0.4	10.3
Cycle Q Clear(g_c), s	22.0	28.0	0.7	0.3	15.0	7.1	1.5	0.0	0.3	4.0	0.4	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	841	2460	766	11	1248	459	42	0	493	558	575	1542
V/C Ratio(X)	1.33	0.78	0.03	0.55	0.74	0.34	0.72	0.00	0.02	0.20	0.02	0.37
Avail Cap(c_a), veh/h	841	2460	766	296	1808	633	79	0	493	558	575	1542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	19.2	12.2	44.6	31.3	25.2	43.7	0.0	22.9	21.4	21.6	11.3
Incr Delay (d2), s/veh	156.7	1.6	0.0	36.2	0.9	0.4	20.7	0.0	0.1	0.2	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.7	13.3	0.3	0.3	7.1	3.1	1.0	0.0	0.2	2.0	0.2	4.1
LnGrp Delay(d),s/veh	190.7	20.9	12.2	80.8	32.2	25.6	64.4	0.0	23.0	21.6	21.7	12.0
LnGrp LOS	F	C	B	F	C	C	E		C	C	C	B
Approach Vol, veh/h		3056			1082			38			692	
Approach Delay, s/veh		83.0			31.5			55.7			13.7	
Approach LOS		F			C			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	29.9	4.6	47.5	6.1	31.8	26.0	26.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	10.0	2.3	2.3	30.0	3.5	12.3	24.0	17.0
Green Ext Time (p_c), s	0.0	2.2	0.0	8.5	0.0	1.0	0.0	5.1

Intersection Summary		
HCM 2010 Ctrl Delay		61.5
HCM 2010 LOS		E

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	55	0	183	51	0	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	0	203	57	0	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	398	232	0	0	260	0
Stage 1	232	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	607	807	-	-	1304	-
Stage 1	807	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	607	807	-	-	1304	-
Mov Cap-2 Maneuver	607	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	607	1304	-
HCM Lane V/C Ratio	-	-	0.101	-	-
HCM Control Delay (s)	-	-	11.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	10	14	11	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	12	0	0	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	12	0	-	0	50	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	38	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1607	-	-	-	959	1069
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1607	-	-	-	952	1069
Mov Cap-2 Maneuver	-	-	-	-	952	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	977	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1607	-	-	-	1069
HCM Lane V/C Ratio	0.007	-	-	-	0.016
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	5	263	31	4	248
Future Vol, veh/h	24	5	263	31	4	248
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	6	292	34	4	276

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	593	309	0	0	327	0
Stage 1	309	-	-	-	-	-
Stage 2	284	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	468	731	-	-	1233	-
Stage 1	745	-	-	-	-	-
Stage 2	764	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	466	731	-	-	1233	-
Mov Cap-2 Maneuver	466	-	-	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	762	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	497	1233	-
HCM Lane V/C Ratio	-	-	0.065	0.004	-
HCM Control Delay (s)	-	-	12.7	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	7	0	0	1	1	5	5	285	1	1	281	0
Future Vol, veh/h	7	0	0	1	1	5	5	285	1	1	281	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	0	1	1	6	6	317	1	1	312	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	646	643	312	642	642	317	312	0	0	318	0	0
Stage 1	314	314	-	328	328	-	-	-	-	-	-	-
Stage 2	332	329	-	314	314	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	385	392	728	387	392	724	1248	-	-	1242	-	-
Stage 1	697	656	-	685	647	-	-	-	-	-	-	-
Stage 2	681	646	-	697	656	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	380	390	728	385	390	724	1248	-	-	1242	-	-
Mov Cap-2 Maneuver	380	390	-	385	390	-	-	-	-	-	-	-
Stage 1	694	655	-	682	644	-	-	-	-	-	-	-
Stage 2	671	643	-	696	655	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	11.3	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	380	580	1242	-	-
HCM Lane V/C Ratio	0.004	-	-	0.02	0.013	0.001	-	-
HCM Control Delay (s)	7.9	-	-	14.7	11.3	7.9	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	294	0	1	288	0	1	0	0	22	0	0
Future Vol, veh/h	0	294	0	1	288	0	1	0	0	22	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	327	0	1	320	0	1	0	0	24	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	320	0	0	327	0	0	649	649	327	649	649	320
Stage 1	-	-	-	-	-	-	327	327	-	322	322	-
Stage 2	-	-	-	-	-	-	322	322	-	327	327	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1240	-	-	1233	-	-	383	389	714	383	389	721
Stage 1	-	-	-	-	-	-	686	648	-	690	651	-
Stage 2	-	-	-	-	-	-	690	651	-	686	648	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1240	-	-	1233	-	-	383	389	714	383	389	721
Mov Cap-2 Maneuver	-	-	-	-	-	-	383	389	-	383	389	-
Stage 1	-	-	-	-	-	-	686	648	-	690	650	-
Stage 2	-	-	-	-	-	-	689	650	-	686	648	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	14.4	15
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	383	1240	-	-	1233	-	-	383
HCM Lane V/C Ratio	0.003	-	-	-	0.001	-	-	0.064
HCM Control Delay (s)	14.4	0	-	-	7.9	-	-	15
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection	
Intersection Delay, s/veh	174.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	81	21	188	0	48	19	30	0	189	371	7
Future Vol, veh/h	0	81	21	188	0	48	19	30	0	189	371	7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	90	23	209	0	53	21	33	0	210	412	8
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	23.7	16.4	44.7
HCM LOS	C	C	E

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	60%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	40%	100%	0%	0%	10%	0%	39%	0%	100%	82%
Vol Right, %	0%	0%	100%	0%	90%	0%	61%	0%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	313	247	7	81	209	48	49	11	691	421
LT Vol	189	0	0	81	0	48	0	11	0	0
Through Vol	124	247	0	0	21	0	19	0	691	346
RT Vol	0	0	7	0	188	0	30	0	0	75
Lane Flow Rate	347	275	8	90	232	53	54	12	768	467
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.891	0.682	0.018	0.258	0.593	0.166	0.156	0.031	1.849	1.109
Departure Headway (Hd)	10.048	9.737	9.015	11.067	9.919	12.01	11.057	9.182	8.667	8.538
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	365	374	399	327	367	301	327	389	422	425
Service Time	7.748	7.437	6.715	8.767	7.619	9.71	8.757	6.956	6.44	6.311
HCM Lane V/C Ratio	0.951	0.735	0.02	0.275	0.632	0.176	0.165	0.031	1.82	1.099
HCM Control Delay	56.3	30.9	11.9	17.6	26.1	17.1	15.8	12.3	411.7	105.8
HCM Lane LOS	F	D	B	C	D	C	C	B	F	F
HCM 95th-tile Q	8.8	4.8	0.1	1	3.6	0.6	0.5	0.1	49.5	16.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	11	1037	75
Future Vol, veh/h	0	11	1037	75
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	12	1152	83
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	293.2
HCM LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	21	188	48	19	30	189	371	7	11	1037	75
Future Volume (veh/h)	81	21	188	48	19	30	189	371	7	11	1037	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	90	23	209	53	21	33	210	412	8	12	1152	83
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	379	35	319	219	144	226	255	653	292	621	1309	94
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.14	0.18	0.18	0.35	0.39	0.39
Sat Flow, veh/h	1345	159	1448	1144	654	1028	1774	3539	1583	1774	3349	241
Grp Volume(v), veh/h	90	0	232	53	0	54	210	412	8	12	608	627
Grp Sat Flow(s),veh/h/ln	1345	0	1607	1144	0	1681	1774	1770	1583	1774	1770	1820
Q Serve(g_s), s	3.5	0.0	8.0	2.7	0.0	1.6	7.0	6.6	0.3	0.3	19.5	19.6
Cycle Q Clear(g_c), s	5.1	0.0	8.0	10.8	0.0	1.6	7.0	6.6	0.3	0.3	19.5	19.6
Prop In Lane	1.00		0.90	1.00		0.61	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	379	0	354	219	0	370	255	653	292	621	692	712
V/C Ratio(X)	0.24	0.00	0.66	0.24	0.00	0.15	0.82	0.63	0.03	0.02	0.88	0.88
Avail Cap(c_a), veh/h	435	0	421	267	0	440	261	1736	777	621	724	744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	21.7	26.6	0.0	19.2	25.4	23.0	20.4	13.0	17.3	17.3
Incr Delay (d2), s/veh	0.3	0.0	2.8	0.6	0.0	0.2	18.6	1.0	0.0	0.0	11.7	11.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	3.8	0.9	0.0	0.8	4.8	3.3	0.1	0.1	11.7	12.0
LnGrp Delay(d),s/veh	21.6	0.0	24.5	27.2	0.0	19.4	44.1	24.0	20.5	13.0	29.0	28.9
LnGrp LOS	C		C	C		B	D	C	C	B	C	C
Approach Vol, veh/h		322			107			630			1247	
Approach Delay, s/veh		23.7			23.3			30.7			28.8	
Approach LOS		C			C			C			C	

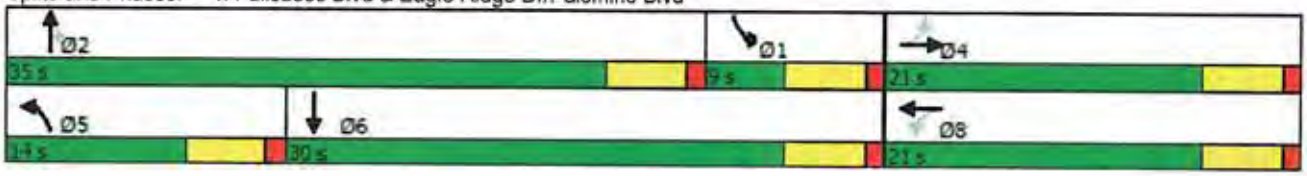
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.4	16.3		18.5	13.8	28.9		18.5
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	30.0		16.0	9.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	2.3	8.6		10.0	9.0	21.6		12.8
Green Ext Time (p_c), s	1.3	2.7		1.2	0.0	2.3		0.7

Intersection Summary		
HCM 2010 Ctrl Delay	28.3	
HCM 2010 LOS	C	

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lag	Lead		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min	None
Maximum Split (s)	9	35	21	14	30	21
Maximum Split (%)	13.8%	53.8%	32.3%	21.5%	46.2%	32.3%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	35	0	44	0	14	44
End Time (s)	44	35	0	14	44	0
Yield/Force Off (s)	39	30	60	9	39	60
Yield/Force Off 170(s)	39	30	49	9	39	49
Local Start Time (s)	21	51	30	51	0	30
Local Yield (s)	25	16	46	60	25	46
Local Yield 170(s)	25	16	35	60	25	35

Intersection Summary	
Cycle Length	65
Control Type	Actuated-Uncoordinated
Natural Cycle	65

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	21	188	48	19	30	189	371	7	11	1037	75
Future Volume (veh/h)	81	21	188	48	19	30	189	371	7	11	1037	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	90	23	209	53	21	33	210	412	8	12	1152	83
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	331	282	320	116	183	258	676	302	646	1371	99
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.19	0.19	0.36	0.41	0.41
Sat Flow, veh/h	1345	1863	1583	1144	654	1028	1774	3539	1583	1774	3349	241
Grp Volume(v), veh/h	90	23	209	53	0	54	210	412	8	12	608	627
Grp Sat Flow(s),veh/h/ln	1345	1863	1583	1144	0	1681	1774	1770	1583	1774	1770	1820
Q Serve(g_s), s	3.4	0.6	7.0	2.3	0.0	1.5	6.4	6.0	0.2	0.2	17.4	17.4
Cycle Q Clear(g_c), s	5.0	0.6	7.0	2.8	0.0	1.5	6.4	6.0	0.2	0.2	17.4	17.4
Prop In Lane	1.00		1.00	1.00		0.61	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	331	331	282	320	0	299	258	676	302	646	725	745
V/C Ratio(X)	0.27	0.07	0.74	0.17	0.00	0.18	0.81	0.61	0.03	0.02	0.84	0.84
Avail Cap(c_a), veh/h	475	531	451	443	0	479	285	1892	846	646	788	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	19.2	21.8	20.4	0.0	19.6	23.3	20.8	18.5	11.4	14.9	14.9
Incr Delay (d2), s/veh	0.4	0.1	3.8	0.2	0.0	0.3	15.3	0.9	0.0	0.0	7.5	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.3	3.3	0.7	0.0	0.7	4.2	3.0	0.1	0.1	10.0	10.2
LnGrp Delay(d),s/veh	22.1	19.3	25.7	20.6	0.0	19.9	38.5	21.7	18.5	11.4	22.5	22.4
LnGrp LOS	C	B	C	C		B	D	C	B	B	C	C
Approach Vol, veh/h		322			107			630			1247	
Approach Delay, s/veh		24.2			20.3			27.3			22.3	
Approach LOS		C			C			C			C	

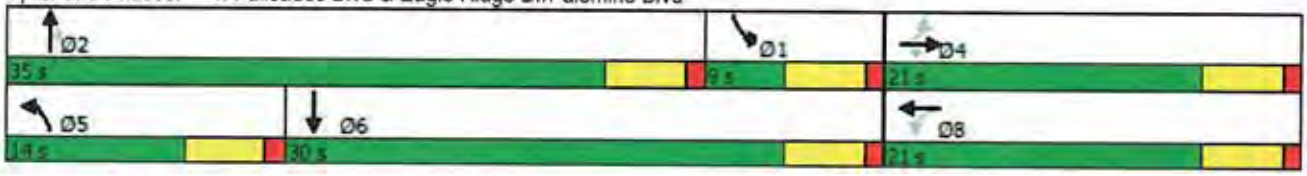
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.4	15.7		15.0	13.2	28.0		15.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	30.0		16.0	9.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	2.2	8.0		9.0	8.4	19.4		4.8
Green Ext Time (p_c), s	1.3	2.7		1.0	0.0	3.6		1.3

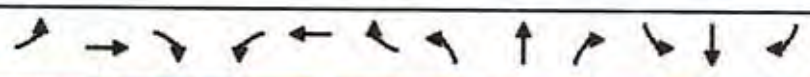
Intersection Summary	
HCM 2010 Ctrl Delay	23.8
HCM 2010 LOS	C

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lag	Lead		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min	None
Maximum Split (s)	9	35	21	14	30	21
Maximum Split (%)	13.8%	53.8%	32.3%	21.5%	46.2%	32.3%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	35	0	44	0	14	44
End Time (s)	44	35	0	14	44	0
Yield/Force Off (s)	39	30	60	9	39	60
Yield/Force Off 170(s)	39	30	49	9	39	49
Local Start Time (s)	21	51	30	51	0	30
Local Yield (s)	25	16	46	60	25	46
Local Yield 170(s)	25	16	35	60	25	35

Intersection Summary	
Cycle Length	65
Control Type	Actuated-Uncoordinated
Natural Cycle	65

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	428	593	10	1	1313	127	16	14	16	187	5	1151
Future Volume (veh/h)	428	593	10	1	1313	127	16	14	16	187	5	1151
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	476	659	11	1	1459	141	18	16	18	208	6	1279
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	535	2563	798	2	1777	624	29	219	246	512	561	1272
Arrive On Green	0.16	0.50	0.50	0.00	0.35	0.35	0.02	0.27	0.27	0.04	0.30	0.30
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	802	902	1774	1863	2787
Grp Volume(v), veh/h	476	659	11	1	1459	141	18	0	34	208	6	1279
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1704	1774	1863	1393
Q Serve(g_s), s	12.2	6.6	0.3	0.1	23.6	5.3	0.9	0.0	1.3	4.0	0.2	27.1
Cycle Q Clear(g_c), s	12.2	6.6	0.3	0.1	23.6	5.3	0.9	0.0	1.3	4.0	0.2	27.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	535	2563	798	2	1777	624	29	0	465	512	561	1272
V/C Ratio(X)	0.89	0.26	0.01	0.51	0.82	0.23	0.63	0.00	0.07	0.41	0.01	1.01
Avail Cap(c_a), veh/h	535	2563	798	118	1921	669	118	0	465	512	561	1272
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	12.7	11.1	44.9	26.7	18.1	44.0	0.0	24.3	24.4	22.1	24.5
Incr Delay (d2), s/veh	16.7	0.1	0.0	128.6	2.8	0.2	20.6	0.0	0.3	0.5	0.0	26.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	3.1	0.1	0.1	11.4	2.4	0.6	0.0	0.7	2.3	0.1	20.4
LnGrp Delay(d),s/veh	53.9	12.8	11.2	173.5	29.5	18.3	64.6	0.0	24.6	24.9	22.1	51.0
LnGrp LOS	D	B	B	F	C	B	E		C	C	C	F
Approach Vol, veh/h		1146			1601			52			1493	
Approach Delay, s/veh		29.9			28.6			38.5			47.2	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	28.5	4.1	49.4	5.4	31.1	18.0	35.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	22.0	6.0	42.0	6.0	20.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	10.0	3.3	2.1	8.6	2.9	29.1	14.2	25.6
Green Ext Time (p_c), s	0.0	6.4	0.0	22.0	0.0	0.0	0.0	5.9

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	93	0	107	162	0	158
Future Vol, veh/h	93	0	107	162	0	158
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	103	0	119	180	0	176

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	385	209	0	0	299	0
Stage 1	209	-	-	-	-	-
Stage 2	176	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	618	831	-	-	1262	-
Stage 1	826	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	618	831	-	-	1262	-
Mov Cap-2 Maneuver	618	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	855	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	618	1262	-
HCM Lane V/C Ratio	-	-	0.167	-	-
HCM Control Delay (s)	-	-	12	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰↑	↑↱		Y	
Traffic Vol, veh/h	30	5	14	0	0	15
Future Vol, veh/h	30	5	14	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	6	16	0	0	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	16	0	-	0	88	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	72	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1602	-	-	-	913	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	951	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1602	-	-	-	894	1063
Mov Cap-2 Maneuver	-	-	-	-	894	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	931	-

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1602	-	-	-	1063
HCM Lane V/C Ratio	0.021	-	-	-	0.016
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	10	303	36	5	280
Future Vol, veh/h	35	10	303	36	5	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	110	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	11	337	40	6	311

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	679	357	0	0	377	0
Stage 1	357	-	-	-	-	-
Stage 2	322	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	417	687	-	-	1181	-
Stage 1	708	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	415	687	-	-	1181	-
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	731	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	455	1181	-
HCM Lane V/C Ratio	-	-	0.11	0.005	-
HCM Control Delay (s)	-	-	13.9	8.1	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection													
Int Delay, s/veh	0.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	4	0	0	0	0	4	4	340	1	0	319	3
Future Vol, veh/h	4	0	0	0	0	4	4	340	1	0	319	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	0	0	4	4	378	1	0	354	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	745	744	356	743	745	378	358	0	0	379	0	0
Stage 1	356	356	-	387	387	-	-	-	-	-	-	-
Stage 2	389	388	-	356	358	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	330	343	688	331	342	669	1201	-	-	1179	-	-
Stage 1	661	629	-	637	610	-	-	-	-	-	-	-
Stage 2	635	609	-	661	628	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	327	342	688	330	341	669	1201	-	-	1179	-	-
Mov Cap-2 Maneuver	327	342	-	330	341	-	-	-	-	-	-	-
Stage 1	659	629	-	635	608	-	-	-	-	-	-	-
Stage 2	629	607	-	661	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.2	10.4	0.1	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1201	-	-	327	669	1179	-	-
HCM Lane V/C Ratio	0.004	-	-	0.014	0.007	-	-	-
HCM Control Delay (s)	8	-	-	16.2	10.4	0	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	334	1	0	341	29	0	0	1	22	0	1
Future Vol, veh/h	1	334	1	0	341	29	0	0	1	22	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	371	1	0	379	32	0	0	1	24	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	411	0	0	-	-	0	770	785	372	769	769	395
Stage 1	-	-	-	-	-	-	374	374	-	395	395	-
Stage 2	-	-	-	-	-	-	396	411	-	374	374	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1148	-	-	0	-	-	318	325	674	318	332	654
Stage 1	-	-	-	0	-	-	647	618	-	630	605	-
Stage 2	-	-	-	0	-	-	629	595	-	647	618	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1148	-	-	-	-	-	317	325	674	317	332	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	317	325	-	317	332	-
Stage 1	-	-	-	-	-	-	646	617	-	629	605	-
Stage 2	-	-	-	-	-	-	628	595	-	645	617	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.4	17.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	674	1148	-	-	-	-	324
HCM Lane V/C Ratio	0.002	0.001	-	-	-	-	0.079
HCM Control Delay (s)	10.4	8.1	-	-	-	-	17.1
HCM Lane LOS	B	A	-	-	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	-	-	0.3

Intersection	
Intersection Delay, s/veh	179.5
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	116	33	188	0	27	30	22	0	232	918	49
Future Vol, veh/h	0	116	33	188	0	27	30	22	0	232	918	49
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	129	37	209	0	30	33	24	0	258	1020	54
Number of Lanes	0	1	1	0	0	1	1	0	0	0	2	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	2
HCM Control Delay	27	16.9	295.7
HCM LOS	D	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	43%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	57%	100%	0%	0%	15%	0%	58%	0%	100%	71%
Vol Right, %	0%	0%	100%	0%	85%	0%	42%	0%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	538	612	49	116	221	27	52	16	341	241
LT Vol	232	0	0	116	0	27	0	16	0	0
Through Vol	306	612	0	0	33	0	30	0	341	171
RT Vol	0	0	49	0	188	0	22	0	0	70
Lane Flow Rate	598	680	54	129	246	30	58	18	379	267
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1.519	1.686	0.124	0.377	0.644	0.098	0.176	0.048	0.969	0.668
Departure Headway (Hd)	9.15	8.927	8.204	11.489	10.381	12.604	11.789	10.563	10.049	9.839
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	401	408	437	316	351	286	306	341	364	369
Service Time	6.911	6.688	5.964	9.189	8.081	10.304	9.489	8.263	7.749	7.539
HCM Lane V/C Ratio	1.491	1.667	0.124	0.408	0.701	0.105	0.19	0.053	1.041	0.724
HCM Control Delay	269.9	341.1	12.1	21	30.1	16.7	17	13.8	72.3	30.2
HCM Lane LOS	F	F	B	C	D	C	C	B	F	D
HCM 95th-tile Q	32.3	40.6	0.4	1.7	4.3	0.3	0.6	0.2	10.7	4.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	16	512	70
Future Vol, veh/h	0	16	512	70
Peak Hour Factor	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	18	569	78
Number of Lanes	0	1	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	53.8
HCM LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	33	188	27	30	22	232	918	49	16	512	70
Future Volume (veh/h)	116	33	188	27	30	22	232	918	49	16	512	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	129	37	209	30	33	24	258	1020	54	18	569	78
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	410	55	311	240	227	165	317	1633	730	31	940	128
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.18	0.46	0.46	0.02	0.30	0.30
Sat Flow, veh/h	1341	244	1376	1129	1004	730	1774	3539	1583	1774	3129	428
Grp Volume(v), veh/h	129	0	246	30	0	57	258	1020	54	18	321	326
Grp Sat Flow(s),veh/h/ln	1341	0	1620	1129	0	1734	1774	1770	1583	1774	1770	1787
Q Serve(g_s), s	4.3	0.0	7.0	1.3	0.0	1.3	7.1	11.1	1.0	0.5	7.9	7.9
Cycle Q Clear(g_c), s	5.7	0.0	7.0	8.3	0.0	1.3	7.1	11.1	1.0	0.5	7.9	7.9
Prop In Lane	1.00		0.85	1.00		0.42	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	410	0	366	240	0	392	317	1633	730	31	531	537
V/C Ratio(X)	0.31	0.00	0.67	0.12	0.00	0.15	0.81	0.62	0.07	0.57	0.60	0.61
Avail Cap(c_a), veh/h	528	0	509	340	0	545	418	1739	778	139	591	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	18.0	21.8	0.0	15.7	20.1	10.4	7.6	24.8	15.2	15.2
Incr Delay (d2), s/veh	0.4	0.0	2.1	0.2	0.0	0.2	9.0	0.6	0.0	15.5	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	3.4	0.4	0.0	0.7	4.2	5.5	0.4	0.4	4.1	4.1
LnGrp Delay(d),s/veh	18.5	0.0	20.1	22.0	0.0	15.9	29.0	11.0	7.7	40.3	16.7	16.7
LnGrp LOS	B		C	C		B	C	B	A	D	B	B
Approach Vol, veh/h		375			87			1332			665	
Approach Delay, s/veh		19.5			18.0			14.4			17.3	
Approach LOS		B			B			B			B	

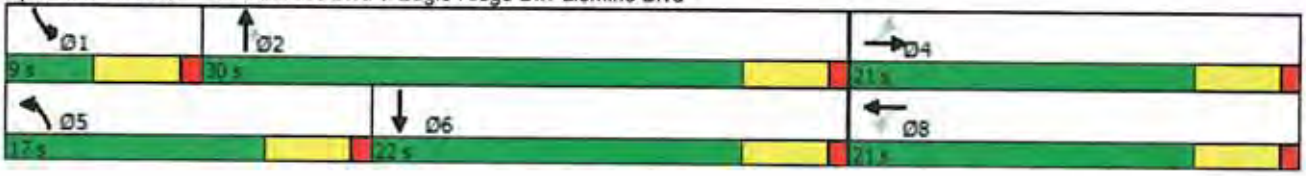
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	28.5		16.5	14.1	20.3		16.5
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0		16.0	12.0	17.0		16.0
Max Q Clear Time (g_c+I1), s	2.5	13.1		9.0	9.1	9.9		10.3
Green Ext Time (p_c), s	0.0	8.2		1.4	0.2	5.3		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min	None
Maximum Split (s)	9	30	21	17	22	21
Maximum Split (%)	15.0%	50.0%	35.0%	28.3%	36.7%	35.0%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	17	39
End Time (s)	9	39	0	17	39	0
Yield/Force Off (s)	4	34	55	12	34	55
Yield/Force Off 170(s)	4	34	44	12	34	44
Local Start Time (s)	43	52	22	43	0	22
Local Yield (s)	47	17	38	55	17	38
Local Yield 170(s)	47	17	27	55	17	27

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	33	188	27	30	22	232	918	49	16	512	70
Future Volume (veh/h)	116	33	188	27	30	22	232	918	49	16	512	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	129	37	209	30	33	24	258	1020	54	18	569	78
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	372	355	302	350	191	139	323	1668	746	32	961	131
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.47	0.47	0.02	0.31	0.31
Sat Flow, veh/h	1341	1863	1583	1129	1004	730	1774	3539	1583	1774	3129	428
Grp Volume(v), veh/h	129	37	209	30	0	57	258	1020	54	18	321	326
Grp Sat Flow(s),veh/h/ln	1341	1863	1583	1129	0	1734	1774	1770	1583	1774	1770	1787
Q Serve(g_s), s	4.2	0.8	5.8	1.1	0.0	1.3	6.5	10.0	0.9	0.5	7.2	7.2
Cycle Q Clear(g_c), s	5.5	0.8	5.8	1.8	0.0	1.3	6.5	10.0	0.9	0.5	7.2	7.2
Prop In Lane	1.00		1.00	1.00		0.42	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	372	355	302	350	0	330	323	1668	746	32	544	549
V/C Ratio(X)	0.35	0.10	0.69	0.09	0.00	0.17	0.80	0.61	0.07	0.57	0.59	0.59
Avail Cap(c_a), veh/h	575	636	541	521	0	592	493	1890	845	152	605	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	15.7	17.7	16.4	0.0	15.9	18.3	9.2	6.8	22.8	13.7	13.7
Incr Delay (d2), s/veh	0.6	0.1	2.8	0.1	0.0	0.2	5.3	0.5	0.0	15.1	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.4	2.7	0.3	0.0	0.6	3.6	4.9	0.4	0.4	3.7	3.7
LnGrp Delay(d),s/veh	18.7	15.8	20.5	16.5	0.0	16.1	23.6	9.7	6.8	37.9	15.0	15.0
LnGrp LOS	B	B	C	B		B	C	A	A	D	B	B
Approach Vol, veh/h		375			87			1332			665	
Approach Delay, s/veh		19.4			16.2			12.3			15.6	
Approach LOS		B			B			B			B	

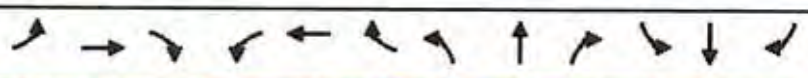
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	27.1		13.9	13.5	19.4		13.9
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0		16.0	13.0	16.0		16.0
Max Q Clear Time (g_c+I1), s	2.5	12.0		7.8	8.5	9.2		3.8
Green Ext Time (p_c), s	0.0	8.7		1.2	0.3	5.1		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min	None
Maximum Split (s)	9	30	21	18	21	21
Maximum Split (%)	15.0%	50.0%	35.0%	30.0%	35.0%	35.0%
Minimum Split (s)	9	21	21	9	21	21
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1	1
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		5	5		5	5
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	18	39
End Time (s)	9	39	0	18	39	0
Yield/Force Off (s)	4	34	55	13	34	55
Yield/Force Off 170(s)	4	34	44	13	34	44
Local Start Time (s)	42	51	21	42	0	21
Local Yield (s)	46	16	37	55	16	37
Local Yield 170(s)	46	16	26	55	16	26

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 4: Palisades Blvd & Eagle Ridge Dr/Palomino Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1056	1723	21	5	826	181	27	4	4	141	10	563
Future Volume (veh/h)	1056	1723	21	5	826	181	27	4	4	141	10	563
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1173	1914	23	6	918	201	30	4	4	157	11	626
Adj No. of Lanes	2	3	1	1	3	1	1	1	0	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2467	768	11	1256	461	42	245	245	556	573	1538
Arrive On Green	0.24	0.49	0.49	0.01	0.25	0.25	0.02	0.29	0.29	0.04	0.31	0.31
Sat Flow, veh/h	3442	5085	1583	1774	5085	1583	1774	856	856	1774	1863	2787
Grp Volume(v), veh/h	1173	1914	23	6	918	201	30	0	8	157	11	626
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1695	1583	1774	0	1712	1774	1863	1393
Q Serve(g_s), s	22.0	28.0	0.7	0.3	14.9	9.3	1.5	0.0	0.3	4.0	0.4	11.7
Cycle Q Clear(g_c), s	22.0	28.0	0.7	0.3	14.9	9.3	1.5	0.0	0.3	4.0	0.4	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	841	2467	768	11	1256	461	42	0	490	556	573	1538
V/C Ratio(X)	1.39	0.78	0.03	0.55	0.73	0.44	0.72	0.00	0.02	0.28	0.02	0.41
Avail Cap(c_a), veh/h	841	2467	768	296	1808	633	79	0	490	556	573	1538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	19.1	12.1	44.6	31.1	25.9	43.7	0.0	23.0	22.2	21.7	11.7
Incr Delay (d2), s/veh	184.7	1.6	0.0	36.2	0.9	0.6	20.7	0.0	0.1	0.3	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.0	13.3	0.3	0.3	7.1	4.1	1.0	0.0	0.2	1.0	0.2	4.6
LnGrp Delay(d),s/veh	218.7	20.7	12.1	80.8	32.0	26.5	64.4	0.0	23.1	22.5	21.8	12.5
LnGrp LOS	F	C	B	F	C	C	E		C	C	C	B
Approach Vol, veh/h		3110			1125			38			794	
Approach Delay, s/veh		95.3			31.3			55.7			14.6	
Approach LOS		F			C			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	29.8	4.6	47.7	6.1	31.7	26.0	26.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	16.0	15.0	39.0	4.0	16.0	22.0	32.0
Max Q Clear Time (g_c+I1), s	16.0	2.3	2.3	30.0	3.5	13.7	24.0	16.9
Green Ext Time (p_c), s	0.0	2.4	0.0	8.5	0.0	0.7	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	68.2
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	137	0	183	130	0	149
Future Vol, veh/h	137	0	183	130	0	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	80	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	152	0	203	144	0	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	442	276	0	0	348	0
Stage 1	276	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	573	763	-	-	1211	-
Stage 1	771	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	573	763	-	-	1211	-
Mov Cap-2 Maneuver	573	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	573	1211	-
HCM Lane V/C Ratio	-	-	0.266	-	-
HCM Control Delay (s)	-	-	13.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	28	14	11	0	0	34
Future Vol, veh/h	28	14	11	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	16	12	0	0	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	12	0	-	0	90	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	78	-
Critical Hdwy	4.12	-	-	-	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	6.12	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1607	-	-	-	895	1069
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1607	-	-	-	882	1069
Mov Cap-2 Maneuver	-	-	-	-	882	-
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	913	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1607	-	-	-	1069
HCM Lane V/C Ratio	0.019	-	-	-	0.035
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

EXHIBIT E
TO
DEVELOPMENT AGREEMENT
FOR COPPERWYND RESORT EXPANSION
BETWEEN
THE TOWN OF FOUNTAIN HILLS
AND
PALISADES RESORTS, LLC

[Schedule of Performance]

See following page.

SCHEDULE OF PERFORMANCE

Deadline to Perform Task From Effective Date of Agreement	Task/Obligation
Phase 1 – 128 Room Expansion	
12 Months	Developer to have submitted Site Plan and Construction Documents for Phase 1 improvements, including Public Infrastructure Improvements.
18 Months	Developer to have begun construction of Phase 1 improvements.
36 Months	Developer to have completed construction of Phase 1 improvements. Developer to have completed Public Infrastructure Improvements for Phase 1.
Phase 2 – 60 Room Expansion	
60 Months	Developer to have submitted Site Plan and Construction Documents for Phase 2 improvements, including Public Infrastructure Improvements.
72 Months	Developer to have completed construction of Phase 2 improvements. Developer to have completed Public Infrastructure Improvements for Phase 2.
Phase 3 – 112 Room Expansion	
12 Months prior to the expiration of the term of this Agreement	Developer to have submitted Site Plan and Construction Documents for Phase 3 improvements, including Public Infrastructure Improvements.
On or prior to the expiration of the term of this Agreement	Developer to have completed construction of Phase 3 improvements. Developer to have completed Public Infrastructure Improvements for Phase 3.