EXHIBIT 2

1390.002

The City of Sparks

Office of the
CITY CLERK

February 7, 2005

Kyle Collinsworth
Centex Homes
9600 Prototype Court
Reno, NV 89521

FILE COPY

Reference: Reconsideration of a Tentative Map

Dear Mr. Collinsworth:

On January 24, 2005, the Sparks City Council approved the Tentative Map associated with PCN04051 to allow the development of a 986 lot single-family residential subdivision on a site approximately 831 acres in size, adopting Findings T1 through T12 and the facts supporting those Findings, subject to revised Conditions of approval 1 through 27. I am enclosing a copy of said Conditions for your files.

If you have any questions or concerns, please feel free to contact Tim Thompson, Associate Planner, at 353-2338.

Sincerely,

Deborine J. Dolan, CMC
City Clerk and
Clerk of the City Council

lzu
Enclosure

Copy:

Tim Thompson, Associate Planner
Terri Thomas, Finance Director
Wood Rodgers, Inc.
- Ord. Nos. 2257; 2258
- Resolution No. 2952
A.I.6.6

CONDITIONS OF APPROVAL FOR PCN04051
Tentative Map

1. **APPROVAL:**
   THE DEVELOPMENT IS APPROVED AS SUBMITTED AND CONDITIONED. ANY SUBSTANTIVE CHANGE SHALL BE REVIEWED BY THE PLANNING COMMISSION AND CITY COUNCIL AS AN AMENDMENT TO THIS TENTATIVE MAP. **THIS APPROVAL IS CONTINGENT UPON THE REGIONAL PLANNING COMMISSION FINDING THE MASTER PLAN AMENDMENT ASSOCIATED WITH THIS PROJECT IN CONFORMANCE WITH THE REGIONAL PLAN AND APPROVING THE DEVELOPMENT AS A PROJECT OF REGIONAL SIGNIFICANCE.**

2. **PROJECT DESCRIPTION:**
   THE PROJECT APPROVAL IS LIMITED TO A 986-LOT SINGLE FAMILY RESIDENTIAL SUBDIVISION ON APPROXIMATELY 244 ACRES RANGING IN SIZE FROM 6,000 SQUARE FEET MINIMUM TO OVER 10,000 SQUARE FEET.

3. **WATER RIGHTS:**
   THE DEVELOPERS SHALL BE DEDICATE SUFFICIENT WATER RIGHTS PER S.M.C. 17.12.075(A)(1) TO ADEQUATELY SERVE THE PROJECT PRIOR TO THE ISSUANCE OF A FINAL MAP FOR THE PROJECT.

4. **STORM DRAINAGE:**
   THE DEVELOPER SHALL PROVIDE A FINAL HYDROLOGICAL REPORT FOR THE PROJECT IN CONFORMANCE WITH THE CITY'S DRAFT HYDROLOGICAL CRITERIA AND DRAINAGE DESIGN MANUAL (HCDDM) FOR REVIEW AND APPROVAL BY THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT PRIOR TO APPROVAL OF A FINAL MAP FOR ANY PORTION OF THE PROJECT. EACH SUCCESSIVE PHASE OF THE PROJECT SHALL SUBMIT AN UPDATED HYDROLOGICAL REPORT FOR REVIEW AND APPROVAL BY THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT SHOWING THE CUMULATIVE EFFECT OF THE DEVELOPED PORTION OF THE PROJECT ALONG WITH THE PROPOSED PHASE'S EFFECT ON THE TOTAL DISCHARGE INTO THE DRAINAGE SYSTEM. THE STORM WATER AND DRAINAGE PLANS FOR THE PHASES OF THE DEVELOPMENT SHALL BE REVIEWED AND APPROVED BY THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT PRIOR TO THE ISSUANCE OF A GRADING PERMIT FOR THE PHASES OF THE PROJECT.

5. **GRADING PERMIT:**
   THE DEVELOPER SHALL SUBMIT A GRADING PLAN FOR ANY PHASE OF THE PROJECT TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT. PRIOR TO THE ISSUANCE OF A GRADING PERMIT FOR ANY PHASE OF THE DEVELOPMENT THE DEVELOPER SHALL POST A SURETY BOND FOR REGRADING AND RECLAIMATION AS WELL AS PROOF OF A STORM WATER DISCHARGE PERMIT FROM THE NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION.

CONDITIONS OF APPROVAL FOR PCN04051
Tentative Map

6. **WASHOE COUNTY DISTRICT HEALTH:**
THE DEVELOPER SHALL COMPLY WITH THE REQUIREMENTS OF THE WASHOE COUNTY DISTRICT HEALTH DEPARTMENT (WCDH) TO THE APPROVAL OF THE ADMINISTRATOR.

7. **ON & OFF SITE IMPROVEMENTS:**
THE DEVELOPER SHALL INSTALL ANY ON AND OFF SITE IMPROVEMENTS INCLUDING BUT NOT LIMITED TO STREET LIGHTS TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT AND THE ADMINISTRATOR.

8. **LANDSCAPING:**
THE DEVELOPER SHALL SUBMIT A LANDSCAPING AND IRRIGATION PLAN FOR THE PROJECT FOR REVIEW AND APPROVAL BY THE COMMUNITY DEVELOPMENT DEPARTMENT. ALL SUCH AREAS SHALL BE CONSISTENT WITH CITY POLICIES REGARDING SIGHT DISTANCE VISIBILITY AT INTERSECTIONS OF PUBLIC STREETS AND PUBLIC STREETS AND PRIVATE DRIVEWAYS. THE LANDSCAPING AND IRRIGATION SHALL BE INSTALLED PER THE APPROVED PLANS PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF OCCUPANCY FOR THE FIRST BUILDING.

THE DEVELOPER SHALL UTILIZE THE URBAN/WILDLANDS INTERFACE LANDSCAPING PRINCIPLES IN DESIGNING AND MAINTAINING LANDSCAPING OF THE INDIVIDUAL LOTS TO THE APPROVAL OF THE FIRE DEPARTMENT AND COMMUNITY DEVELOPMENT DEPARTMENT PRIOR TO APPROVAL OF A BUILDING PERMIT FOR THE PROJECT.

9. **RIGHT-OF-WAY DEDICATION:**
THE DEVELOPER SHALL RESERVE FROM DEVELOPMENT THE ULTIMATE RIGHT-OF WAY WIDTH FOR ALL PUBLIC STREETS PROPOSED WITHIN THE PROJECT WITH THE RECORDATION OF A FINAL MAP FOR THE PROJECT OR ANY PORTION OF THE PROJECT TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT WITH INPUT FROM THE REGIONAL TRANSPORTATION COMMISSION STAFF AND IN ACCORDANCE WITH THE REGIONAL ROAD IMPACT FEE CAPITAL IMPROVEMENT PROGRAM.

10. **ROAD SECTIONS:**
THE DEVELOPER SHALL SUBMIT IMPROVEMENT PLANS WITH ROADWAY CROSS-SECTIONS THAT COMPLY WITH THE CITY'S PAVEMENT STANDARDS TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT. THE INSTALLED PAVEMENT SECTIONS SHALL COMPLY WITH THE APPROVED IMPROVEMENT PLANS. THE PLANS SHALL ALSO INCLUDE ALL NECESSARY IMPROVEMENTS TO PROVIDE IRRIGATION TO LANDSCAPE MEDIANS AND ISLANDS WITH IN THE RIGHT-OF-WAY TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT, THE PARKS & RECREATION DIRECTOR AND THE ADMINISTRATOR.

CONDITIONS OF APPROVAL FOR PCN04051
Tentative Map

11. STREET IMPROVEMENTS:

THE DEVELOPER SHALL INSTALL FULL-STREET IMPROVEMENTS FOR THE PROJECT PER THE APPROVED IMPROVEMENT PLANS, INCLUDING LANDSCAPE IRRIGATION IMPROVEMENTS. THE TIMING OF THE INSTALLATION SHALL OCCUR AS THE ABUTTING/ADJACENT DEVELOPMENT OF THE PROJECT OCCURS TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT.

12. INTERSECTION IMPROVEMENTS AT LOS ALTOS PARKWAY AND VISTA HEIGHTS DRIVE:

THE DEVELOPER SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF A ROUNDABOUT AT THE INTERSECTION OF LOS ALTOS PARKWAY AND VISTA HEIGHTS DRIVE TO THE APPROVAL OF THE ENGINEERING SERVICES MANAGER FOR COMMUNITY DEVELOPMENT AND THE PUBLIC WORKS DIRECTOR. THE INTERSECTION IMPROVEMENTS SHALL BE CONSTRUCTED WITH THE FINAL MAP THAT YIELDS 200 LOTS CONNECTED TO VISTA HEIGHTS DRIVE AND NO ADDITIONAL FINAL MAP SHALL BE RECOMMENDED FOR FINAL APPROVAL UNTLIL THE INTERSECTION IMPROVEMENTS ARE SUBSTANTIALLY COMPLETE.

13. INTERSECTION IMPROVEMENTS AT LOS ALTOS PARKWAY AND BELMAR DRIVE:

THE DEVELOPER SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF A ROUNDABOUT AT THE INTERSECTION OF LOS ALTOS PARKWAY AND BELMAR DRIVE TO THE APPROVAL OF THE ENGINEERING SERVICES MANAGER FOR COMMUNITY DEVELOPMENT AND THE PUBLIC WORKS DIRECTOR. THE INTERSECTION IMPROVEMENTS SHALL BE CONSTRUCTED WITH THE FINAL MAP THAT YIELDS 250 LOTS DIRECTLY CONNECTED TO BELMAR DRIVE AND NO ADDITIONAL FINAL MAP SHALL BE RECOMMENDED FOR FINAL APPROVAL UNTLIL THE INTERSECTION IMPROVEMENTS ARE SUBSTANTIALLY COMPLETE.

14. ROADWAY IMPROVEMENTS ON LOS ALTOS PARKWAY:

THE DEVELOPER SHALL ENTER INTO A CAPITAL CONTRIBUTION FRONT ENDING AGREEMENT (CCFEA) FOR THE WIDENING OF LOS ALTOS PARKWAY FROM TWO TO FOUR LANES FROM THE INTERSECTION OF VISTA BLVD (SOUTH) TO BELMAR DRIVE TO THE APPROVAL OF THE ENGINEERING SERVICES MANAGER FOR COMMUNITY DEVELOPMENT AND THE REGIONAL TRANSPORTATION COMMISSION (RTC). THE ROADWAY IMPROVEMENTS ON LOS ALTOS PARKWAY SHALL BE CONSTRUCTED WITH THE FINAL MAP THAT YIELDS 600 LOTS AND NO ADDITIONAL FINAL MAP SHALL BE RECOMMENDED FOR FINAL APPROVAL UNTIL THE ROADWAY IMPROVEMENTS ARE SUBSTANTIALLY COMPLETE.

CONDITIONS OF APPROVAL FOR PCN04051
Tentative Map

15. BELMAR DRIVE CONSTRUCTION:

WITH THE CONSTRUCTION OF BELMAR DRIVE INTO THE PROJECT, THE DEVELOPER SHALL INSTALL LANDSCAPING AND/OR BERMMING TO MITIGATE ANY NOISE AND LIGHT IMPACTS TO THE HOMES WHICH ARE ADJACENT TO THE BELMAR DRIVE EXTENSION. THE IMPROVEMENT PLANS FOR BELMAR SHALL INCLUDE THE LANDSCAPING IMPROVEMENTS. THESE IMPROVEMENTS ARE TO BE CONSTRUCTED TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT AND THE ADMINISTRATOR.

16. AVIGATION EASEMENT:

THE DEVELOPER SHALL DEMONSTRATE TO THE APPROVAL OF THE ADMINISTRATOR THAT AN AVIGATION EASEMENT HAS BEEN GRANTED TO AND ACCEPTED BY THE AIRPORT AUTHORITY OF WASHOE COUNTY PRIOR TO ISSUANCE OF A BUILDING PERMIT FOR THE PROJECT.

17. PROJECT CONTACT:

THE DEVELOPER SHALL DESIGNATE TO THE ADMINISTRATOR A PROJECT CONTACT PERSON RESPONSIBLE/AUTHORIZED TO CORRECT PROBLEMS REGARDING THE PROJECT ON A 24-HOUR/7-DAYS A WEEK BASIS. THE DEVELOPER SHALL DESIGNATE THE PROJECT CONTACT PERSON TO THE ADMINISTRATOR PRIOR TO ISSUANCE OF A GRADING PERMIT FOR THE PROJECT.

18. ROCKERIES:

ALL ROCKERIES SHALL BE DESIGNED AND CONSTRUCTED PER THE PERSCRIPTIVE STANDARDS SET FORTH BY THE COMMUNITY DEVELOPMENT DEPARTMENT. EACH ROCKERY SHALL BE REQUIRED TO BE PERMITTED THROUGH THE BUILDING DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT.

19. FIRE DEPARTMENT:

THE DEVELOPERS SHALL COMPLY WITH THE REQUIREMENTS OF THE FIRE DEPARTMENT TO THE APPROVAL OF THE FIRE CHIEF INCLUDING, BUT NOT LIMITED TO: LOCATING FIRE HYDRANTS; AND INSTALLING AND MAKE OPERATIONAL ALL FIRE HYDRANTS WITHIN THE PROJECT OR PORTION OF THE PROJECT PRIOR TO PLACING COMBUSTIBLE MATERIALS ON-SITE.

ALL RESIDENTIAL STRUCTURES WITHIN THIS SUBDIVISION WHICH ARE OUTSIDE OF THE ESTABLISHED RESPONSE TIME OF 6 MINUTES, ARE REQUIRED TO INSTALL A FIRE SUPPRESSION SYSTEM TO THE APPROVAL OF THE FIRE CHIEF PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR THAT STRUCTURE.

THE CUL-DE-SAC BULB SHALL BE A MINIMUM 50-FOOT RADIUS TURN-AROUND FOR FIRE APPARATUS CLEARANCE AS MEASURED FROM FRONT FACE OF CURB TO FRONT FACE OF CURB.

20. MIRAMONTE HANDBOOK:

THE DEVELOPER SHALL COMPLY WITH ALL STANDARDS, CONDITIONS AND REGULATIONS IN THE MIRAMONTE HANDBOOK.

21. PROJECT INFRASTRUCTURE:

THE PROJECT'S INFRASTRUCTURE INCLUDING BUT NOT LIMITED TO COMMON AREA LANDSCAPING, STREET LIGHTS, AND REVEGETATION OF DISTURBED SLOPES, SHALL BE INSTALLED TO THE APPROVAL OF THE COMMUNITY DEVELOPMENT DEPARTMENT PRIOR TO THE FINAL INSPECTION OF ANY INDIVIDUAL SINGLE FAMILY RESIDENCE FOR EACH PHASE.

22. LOT FIT PLAN:

THE DEVELOPER SHALL PROVIDE A LOT FIT PLAN DEMONSTRATING THAT AT LEAST ONE MODEL PLAN WILL FIT ON EACH LOT LOCATED IN THE SUBDIVISION TO THE APPROVAL OF THE ADMINISTRATOR PRIOR TO THE RECORDATION OF ANY FINAL MAP FOR THE PROJECT.

23. FENCING PLAN:

THE DEVELOPER SHALL PROVIDE A FENCING PLAN, DEMONSTRATING THE TYPE AND LOCATION FOR ALL FENCING TO BE UTILIZED IN THE PROJECT TO THE APPROVAL OF THE ADMINISTRATOR PRIOR TO THE ISSUANCE OF A BUILDING PERMIT FOR THE PROJECT.

FENCING ON CORNER LOTS SHALL COMPLY WITH SIGHT VISIBILITY STANDARDS TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT AND THE ADMINISTRATOR.

24. ARCHITECTURE/BUILDING ELEVATIONS:

THE DEVELOPMENT OF THE SUBJECT SITE SHALL COMPLY WITH THE ARCHITECTURAL REQUIREMENTS ESTABLISHED WITHIN THE CITY OF SPARKS DESIGN STANDARDS MANUAL. BUILDING ELEVATIONS MUST BE APPROVED BY THE PLANNING COMMISSION AS A GENERAL BUSINESS ITEM PRIOR TO THE ISSUANCE OF A BUILDING PERMIT FOR THE SITE. THE DEVELOPER SHALL ARTICULATE LONG FACADES BY VARYING BUILDING MASS, FORM, TEXTURE, AND INTERPLAY OF SOLID AND OPEN AREAS.

25. BUILDING DEPARTMENT:

THE DEVELOPER SHALL COMPLY WITH ALL REQUIREMENTS OF THE BUILDING DEPARTMENT, INCLUDING BUT NOT LIMITED TO DEMONSTRATING THAT NO DRIVEWAY

EXCEEDS A GRADE OF 12%, TO THE APPROVAL OF THE BUILDING OFFICIAL PRIOR TO THE ISSUANCE OF ANY BUILDING PERMIT FOR THE PROJECT.

26. CUT / FILL SLOPES:

THE DEVELOPER SHALL SUBMIT GRADING AND SITE REVEGETATION PLANS TO THE APPROVAL OF THE ENGINEERING DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT AND ADMINISTRATOR. THE DEVELOPER SHALL GRADE AND REVEGETATE THE PROJECT SITE TO THE SPECIFICATIONS OF THE APPROVED PLANS TO THE APPROVAL OF THE ENGINEERING DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT AND THE ADMINISTRATOR.

27. TRAFFIC CALMING:

THE DEVELOPER SHALL INSTALL TWO TRAFFIC CALMING DEVICES ALONG THE EXISTING ALIGNMENT OF VISTA HEIGHTS DRIVE TO THE APPROVAL OF THE ENGINEERING MANAGER FOR COMMUNITY DEVELOPMENT, THE PUBLIC WORKS DIRECTOR, AND THE FIRE MARSHALL.

895 Roberta Lane, Suite 104, Sparks, NV 89431
(775) 359-3303 Fax (775) 359-3329

odyssey ENGINEERING INCORPORATED

September 20, 2017

Mr. Jon Ericson, P.E., P.T.O.E.
City Engineer
City of Sparks Community Services Department
431 Prater Way
Sparks, NV 89431

Re: Miramonte (PCN04051) Condition Amendment Request

Dear Mr. Ericson:

On behalf of the applicant, Ryder NV Management, LLC., and the property owners, MTA Development LLC., James and Dorothy Lyon Family Trust, Corona Miramonte LLC., and Fort Apache Homes Inc., Odyssey Engineering appreciates your consideration of the enclosed application request to amend the Miramonte Conditions of Approval (PCN04051).

Miramonte is an ±831 acre, 986 lot single family residential subdivision, located east of Los Altos Parkway between Belmar Drive and Vista Heights Drive. On January 24, 2005, the City Council approved a request for tentative map for the 986 lot single family residential subdivision. A letter requesting a 2 year extension was submitted and approved on August 10, 2017 extending the expiration date of the tentative map to August 10, 2019.

The proposed request is to amend condition #14 which states;

> *"The developer shall enter into a capital contribution front ending agreement (CCFEA) for the widening of Los Altos Parkway from two to four lanes from the intersection of Vista Blvd (South) to Belmar Drive to the approval of the Engineering Services Manager for Community Development and the Regional Transportation Commission (RTC). The roadway improvements on Los Altos Parkway shall be constructed with the final map that yields 600 lots and no additional final map shall be recommended for final approval until the roadway improvements are substantially complete."*

The Miramonte Townhome Development consisting of a 448 lot townhome subdivision was approved by City Council on May 22, 2017. As part of the tentative map application package, a Traffic Impact Study was prepared to analyze the effects of the additional units to the current roadways including Los Altos Parkway between Belmar Drive and Vista Boulevard. In the analysis, it was determined that in the existing conditions (buildout of Miramonte Phases 1-7), no roadway improvements would be necessary for Los Altos to operate at a level of service D as required by RTC. A condition was placed on the project (Condition #4 of the Conditions of Approval) requiring that the developer comply with

RTC's letter recommending that the westbound left turn pocket be extended to accommodate 400 feet of storage.

Ryder Homes is currently looking to develop Miramonte Phase 5 and a portion of Miramonte Phase 6 totaling 91 units. A Traffic Impact Study was prepared for this portion of the project which also analyzed the effects of the development in relationship to the level of service on Los Altos Parkway. This study also took into consideration all known and potential developable areas contributing to this section of Los Altos Parkway. The study found that no improvements are necessary on Los Altos Parkway with the additional 91 units in order to maintain the required level of service D.

Based on the new findings between the two Traffic Impact Studies, a request to amend the current condition is being requested.

Please find the enclosed application materials:

- Application for Tentative Map requesting a Condition Amendment
- Applicant affidavit
- Vicinity Map
- Original Tentative Map – Miramonte (Reduced copy)
- Miramonte Conditions of Approval, date February 7, 2005
- Miramonte Townhome Conditions of Approval, date June 29, 2017
- RTC Letter, Miramonte Townhome Development, date March 7, 2017
- Traffic Impact Study Miramonte Townhome Development, date August 9, 2017
- Traffic Impact Study Miramonte-Andelin, date September 8, 2017

In order to provide the City with Owner affidavits, we are requesting staff to provide Ryder Homes with a draft amended condition that can be provided to the owners for review and comment. Once reviewed and approved by the owners, Affidavits will be provided to complete the application. It is understood that until these affidavits are provided, the condition amendment cannot be placed on the Planning Commission agenda.

If you have any questions or require any additional information, please feel free to contact me directly at (775) 236-0556.

Sincerely,

Odyssey Engineering, Inc.

Kenneth W. Anderson, P.E.
Senior Engineer

Odyssey Engineering, Incorporated
895 Roberta Lane, Suite 104 - Sparks, Nevada 89431
Ph: (775) 359-3303 Fax: (775) 359-3329
www.odyssey-civil-engineering.com

TENTATIVE MAP
APPLICATION CHECKLIST
City of Sparks, Nevada

The following items shall be submitted as a part of the Tentative Map application:

☐ n/a 1. **Health Department, Division of Water Resources, and Division of Environmental Protection Application Fees:** Additional fees are assessed by the District Health Department, Division of Water Resources, and Division of Environmental Protection for review of your application. Please include separate checks and/or money orders payable to each of the separate entities with your application. **The fees are due on the day the application is submitted. Please Contact Washoe County District Health Department at (775) 328-2400 for correct amount.**

☑ 2. **Application Fee:** A check or money order payable to the "City of Sparks" for the application fee. T**he application fee is due at the time of the application submittal**. See **FEE SCHEDULE** for correct amount. $1,250.00

☐ SEE ATTACHED LETTER 4. **Proof of Ownership:** If the person signing the owner's affidavit is not listed as the property owner in the most recent records of the Washoe County Assessor, proof of ownership acceptable to the administrator must be submitted with the application. If the signer is an agent of the owner, written documentation of that fact acceptable to the administrator must be submitted. If in Corporate ownership, a list of all Corporate Officers must be provided.

☑ 5. **Traffic Study:** Four (4) copies of a complete traffic study as required by the City Engineer. 1 COPY + DISK

☐ 6. **Review Packets:** Fifteen (15), each containing the following:

- ☑ a. Completed Development Application form
- n/a ☐ b. Completed Residential or Non-Residential Project Data Sheet
- n/a ☐ c. A Tentative Subdivision Map prepared to the attached specifications
- n/a ☐ d. **If drawings larger than 8½" x 11" are included with the application, one 8½" x 11" or 11" x 17" MUST be provided.**
- ☑ e. Vicinity Map depicting the respective site and including surrounding roadways.
- n/a ☐ f. A letter of approval from the Regional Street Naming Committee listing all street names shown on the Tentative Map
- n/a ☐ g. A copy of a preliminary Title Report, prepared within 30 days of application submittal, which includes the names and addresses of all property owners; a legal description of the property, and a description of all liens, easements, and deed restrictions.
- n/a ☐ h. A preliminary hydrology and drainage report prepared by a Nevada registered Civil Engineer, addressing the 5-year and 100-year return frequency storms and the 5-year and 100-year flows entering and leaving the site.
- n/a ☐ i. A preliminary sewer report prepared by a Nevada registered Civil Engineer.
- n/a ☐ j. Demonstrate that city services can be provided at an acceptable service level.
- n/a ☐ k. Is the project site 20 or more acres in size?
  - ☐ No
  - ☐ Yes, all 20 or more acre development projects must demonstrate the project is fiscally positive to the city for a period of at least 20 years.
- n/a ☐ l. Proof of property tax payment.
- ☑ m. One packet containing the original signed owners affidavit shall be provided and shall be clearly labeled "Community Services Department Original"

NOTE:

- **The Community Services Department may request that additional application materials be submitted depending on the specific project request. The application materials required above shall serve as the minimum requirements necessary to make application submittal to the Community Services Department.**

DEVELOPMENT APPLICATION

ACTION REQUESTED:

___ Administrative Review
___ Administrative Review MME
___ Annexation
___ Conditional Use Permit
___ Master Plan Amendment
___ Major Deviation
___ Minor Deviation
___ Planned Development
___ Rezoning
___ Tentative Subdivision Map
___ Variance
☑ Condition Amendment

CASE NUMBER:	FEE:
_____	$_____
Noticing Fee _____	$_____
TOTAL FEE:	$_____

Rec'd by: _____ Date: _____

(For Planning Department Use Only)

DATE: 9/20/17

PROJECT NAME: Miramonte (PCN04051)

PROJECT DESCRIPTION: Request to amend existing Condition of Approval #14 of the original Conditions of Approval.

(Mark one box to indicate responsible party and mailing address)

☐ **PROPERTY OWNER***

Name: See attached letter

Address: _____

City_____ State_____ ZipCode_____

Phone: _____ Fax: _____

Contact Person: _____

E-mail Address: _____

☑ **APPLICANT***

Name: Ryder NV Management, LLC

Address: 985 Damonte Ranch Parkway, Suite 140

City Reno State Nevada ZipCode 89521

Phone: 775-823-3788 Fax: 775-823-3799

Contact Person: Steve Thomsen

E-mail Address: steve@ryderhomes.com

☐ **PERSON / FIRM PREPARING PLANS**

Name: Odyssey Engineering, Inc.

Address: 895 Roberta Lane, Suite 104

City Sparks State Nevada ZipCode 89431

Phone: 775-236-0556 Fax: 775-359-3329

Contact Person: Kenneth W. Anderson, P.E.

E-mail Address: ken@odysseyreno.com

PROJECT ADDRESS:

Miramonte PUD

PARCEL NO. (APN): _____

_____

PROPERTY SIZE: _____

EXISTING ZONING: PUD

PROPOSED ZONING: PUD

MASTER PLANNED LAND USE: _____

EXISTING USE: _____

_____

SURROUNDING USES:

North _____

East _____

South _____

West _____

If a corporation please attach a list of corporate officers.

If a partnership please list all general partners.

NOTE: Affidavits must be signed by both the property owner and the developer/lessee and notarized before the application is submitted.

Revised 12/2015

EXHIBIT 4

TRAFFIC IMPACT STUDY

FOR

MIRAMONTE TOWNHOME DEVELOPMENT

August 9, 2016

PREPARED BY:

TRAFFIC WORKS LLC

TRAFFIC WORKS, LLC
5482 Longley Lane, Suite B, Reno, NV 89511
775.322.4300
www.Traffic-Works.com

YOUR QUESTIONS ANSWERED QUICKLY

Why did you perform this study?

This Traffic Impact Study evaluates the potential traffic impacts associated with construction of the proposed Miramonte Townhome Development.

What does the project consist of?

The proposed project consists of up to 448 residential ownership townhome units.

How much traffic will the project generate?

The proposed project is anticipated to generate a total of 2,371 daily trips, 171 AM peak hour trips, and 206 PM peak hour trips. The ITE trip generation manual does not provide any guidance regarding off-peak trip generation. Hence, as a conservative estimate, the AM off-peak trip generation was assumed to be the same as trip generation during the AM peak hour.

Are there any traffic impacts?

All the study intersections are anticipated to operate at acceptable level of service conditions under the "Plus Project" scenario. However, excessive queuing is anticipated to occur at the Los Altos Parkway/Vista Boulevard (south) intersection. With the addition of the project traffic and existing lane configurations, the average westbound queue length is anticipated to be approximately 725 feet during the AM peak hour, which exceeds a reasonable queue length at this location.

Are any traffic related improvements proposed?

The following two improvements are recommend to mitigate anticipated queuing issues at the Los Altos Parkway/Vista Boulevard (south) intersection:

- Extend the westbound left-turn pocket (on Los Altos Parkway) to 400 feet of striped storage length.
- Optimize the green times allocated to the side street movements (eastbound and westbound).

No other mitigations are proposed at any other study intersections since the analysis showed that the anticipated project traffic does not cause any other significant impacts requiring mitigation. Los Altos Parkway south of Belmar Drive (existing two-lane facility) is anticipated to operate at LOS "C" in 2015 and in 2035 with the addition of the project traffic. A two-lane facility is shown to provide sufficient capacity (LOS "C") through the year 2035. The project's contribution of Regional Road Impact Fees will mitigate the minor project effects on the overall roadway network.

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections and roadway segments associated with construction of the Miramonte Townhome Development. This traffic impact study has been prepared to document existing traffic conditions, quantify traffic volumes generated by the proposed project, identify potential impacts, document findings, and make recommendations to mitigate impacts, if any are found.

Study Area and Evaluated Scenarios

The project site is located east of Los Altos Parkway, on the east side of Belmar Drive, in Sparks, NV. The study intersections were identified based on scoping conversations with City of Sparks staff. The project site location and the study intersections are shown in **Figure 1**. The following intersections are included in this study:

- Vista Blvd / Los Altos Pkwy (south)
- Los Altos Pkwy / Belmar Drive
- Belmar Drive / Project Access Road
- Los Altos Pkwy / Vista Heights Drive
- Vista Blvd / Los Altos Pkwy (north)

The following roadway segments were also analyzed:

- Los Altos Pkwy (south of Belmar Drive)
- Los Altos Pkwy (north of Belmar Drive) – Year 2035 only

This study includes analysis of the both the weekday AM and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The study also includes analysis of the AM off-peak hour, between 9:30 AM and 10:30 AM which occurs after the school peak time period. The evaluated development scenarios are:

- Existing Conditions (no project)
- Baseline Conditions (existing plus traffic generated by approved but unbuilt lots)
- Baseline Plus Project Conditions

Analysis Methodology

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades “A” through “F” with “A” representing optimum conditions and “F” representing breakdown or over capacity flows. The complete methodology is established in the Highway Capacity Manual (HCM), 2010, published by the Transportation Research Board.

Signalized and Un-signalized Intersections

Table 1 presents the delay thresholds for each level of service grade at un-signalized and signalized intersections.

Table 1: Level of Service Definition for Intersections

Level of Service	Brief Description	Un-signalized Intersections (average delay/vehicle in seconds)	Signalized Intersections (average delay/vehicle in seconds)
A	Free flow conditions.	< 10	< 10
B	Stable conditions with some affect from other vehicles.	10 to 15	10 to 20
C	Stable conditions with significant affect from other vehicles.	15 to 25	20 to 35
D	High density traffic conditions still with stable flow.	25 to 35	35 to 55
E	At or near capacity flows.	35 to 50	55 to 80
F	Over capacity conditions.	> 50	> 80

Source: Highway Capacity Manual (2010), Chapters 16 and 17

Level of service calculations were performed for the study intersections using the Synchro 9 software suite, with analysis and results reported in accordance with HCM methodology.

Roadway Segments

Table 2 shows the level of service thresholds for roadway segments as established in the Washoe County *2035 Regional Transportation Plan* (2035 RTP). The daily traffic volumes were compared to the daily volume thresholds shown in **Table 2** to determine roadway segment level of service.

Level of Service Policy

The 2035 Regional Transportation Plan (2035 RTP) establishes level of service criteria for regional roadway facilities within Washoe County, the City of Reno, and the City of Sparks. The current Level of Service policy is:

- "All regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon – LOS D or better."
- "All regional roadway facilities projected to carry 27,000 ADT or more at the latest RTP horizon – LOS E or better."
- "All intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting roadways".

According to the Nevada Department of Transportation's 2014 AADT data, the average daily volumes on the study roadways are less than 27,000 ADT. Hence, the level of service threshold specific to the study roadways and intersections is LOS "D".

Table 2: Average Daily Traffic LOS Thresholds by Facility Type for Roadway Planning

Facility Type	Maximum Service Flow Rate (daily for given service level)				
Number of Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Freeway					
4	≤ 28,600	42,700	63,500	80,000	90,200
6	≤ 38,300	61,200	91,100	114,000	135,300
8	51,100	81,500	121,400	153,200	180,400
10	63,800	101,900	151,800	191,500	225,500
Arterial-High Access Control					
2	n/a	9,400	17,300	19,200	20,300
4	n/a	20,400	36,100	38,400	40,600
6	n/a	31,600	54,700	57,600	60,900
8	n/a	42,500	73,200	76,800	81,300
Arterial-Moderate Access Control					
2	n/a	5,500	14,800	17,500	18,600
4	n/a	12,000	32,200	35,200	36,900
6	n/a	18,800	49,600	52,900	55,400
8	n/a	25,600	66,800	70,600	73,900
Arterial/Collector-Low Access Control					
2	n/a	n/a	6,900	13,400	15,100
4	n/a	n/a	15,700	28,400	30,200
6	n/a	n/a	24,800	43,100	45,400
8	n/a	n/a	34,000	57,600	60,600
Arterial/Collector-Ultra-Low Access Control					
2	n/a	n/a	6,500	13,300	14,200
4	n/a	n/a	15,300	27,300	28,600
6	n/a	n/a	24,100	41,200	43,000
8	n/a	n/a	33,300	55,200	57,400
Source: Washoe County 2035 RTP Table 3-4.					

EXISTING TRANSPORTATION FACILITIES

Roadway Facilities

A brief description of the key roadways in the study area is provided below.

Vista Boulevard within the study area is a four-lane north-south roadway with two lanes in each direction. It is classified as a "Medium Access Control Arterial" in the 2035 RTP. The posted speed limit is 40 mph in the study area.

Los Altos Parkway is a two-lane roadway with one lane in each direction. It is classified as a "Medium Access Control Arterial" in the 2035 RTP. The posted speed limit is 35 mph.

Belmar Drive is a two-lane roadway that serves as one of the main access roadways to the project. It is classified as a "Low Access Control Collector" in the 2035 RTP.

Vista Heights Drive is a two-lane roadway east of Los Altos Parkway. The posted speed limit is 25 mph.

Alternate Travel Modes

There are currently sidewalks along the east side of Los Altos Parkway south of Goodwin Road, the west side of Los Altos Parkway north of Goodwin Road, both sides of Belmar Drive, both sides of Vista Heights Drive, and both sides of Vista Boulevard. Dedicated bike lanes exist in both directions on Los Altos Parkway and Vista Boulevard. The project site is adequately served with bicycle and pedestrian facilities.

EXISTING CONDITIONS

Traffic Volumes

Existing traffic volumes were determined by conducting new video counts at the study intersections. The counts were conducted during an average mid-week day on February 2nd, 2016 with schools in session. The existing intersection traffic volumes and lane configurations are shown on **Figure 2,** attached.

Intersection Level of Service

Level of service calculations were performed using the existing traffic volumes, lane configurations, and traffic controls. The results are presented in **Table 3** and the calculation sheets are provided in **Appendix A**, attached.

As shown in **Table 3**, all the study intersections operate at acceptable level of service conditions during both the AM and PM peak hours, and also during the AM off-peak hour.

Table 3: Existing Conditions Intersection Level of Service Summary

Intersection	AM Peak		AM Off-Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay
Los Altos Pkwy/Vista Blvd (south)	C	32.8	C	24.5	C	26.3
Los Altos Pkwy/Belmar Dr	A	6.8	A	5.7	A	7.0
Los Altos Pkwy/Vista Heights Dr	A	6.4	A	4.2	A	6.1
Los Altos Pkwy/Vista Blvd (north)	C	23.6	B	18.5	C	31.3

Roadway Level of Service

Table 4 summarizes the existing daily volumes on Los Altos Parkway south of Belmar Drive and the corresponding level of service.

Table 4: Existing Conditions Road Segment Level of Service Summary

Class	Segment	# Lanes	Daily Volume	LOS
MAC	Los Altos Parkway south of Belmar Drive	2	10,400	C

As shown in **Table 4**, Los Altos Parkway south of Belmar Drive currently operates at LOS "C".

BASELINE CONDITIONS

Baseline Traffic Volumes

A previously approved development is located north of the proposed project on Belmar Drive. The MTA Development has approximately 138 unbuilt lots that are approved for single family housing units. The baseline traffic volumes were obtained by adding the trips generated by these 138 approved but unbuilt single family homes to the existing traffic volumes. The baseline traffic volumes are shown on **Figure 4**, attached.

Intersection Level of Service

Level of service calculations were performed using the baseline traffic volumes, existing lane configurations, and existing traffic controls. The results are presented in **Table 5** and the calculation sheets are provided in **Appendix B**, attached.

As shown in **Table 5**, all the study intersections are anticipated to operate at acceptable LOS conditions.

Table 5: Baseline Conditions Intersection Level of Service Summary

Intersection	AM Peak		AM Off-Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay
Los Altos Pkwy/Vista Blvd (south)	C	33.6	C	26.4	C	27.7
Los Altos Pkwy/Belmar Dr	A	7.2	A	6.1	A	8.0
Los Altos Pkwy/Vista Heights Dr	A	6.7	A	4.5	A	6.4
Los Altos Pkwy/Vista Blvd (north)	C	24.8	B	19.4	C	33.2

Roadway Level of Service

Table 6 summarizes the baseline conditions daily volumes on Los Altos Parkway south of Belmar Drive and the corresponding level of service.

Table 6: Baseline Conditions Road Segment Level of Service Summary

Class	Segment	# Lanes	Baseline	
			Daily Volume	LOS
MAC	Los Altos Parkway south of Belmar Drive	2	11,193	C

Los Altos Parkway south of Belmar Drive is anticipated to continue to operate at LOS "C" with the baseline traffic volumes.

Queue Length Analysis

A micro-simulation analysis was performed using SimTraffic to evaluate westbound queue lengths at the Los Altos Parkway/Vista Boulevard (south) intersection. Multiple simulation runs were performed to account for the variations that inherently occur between different days. All the simulations were then averaged to obtain a representation of a typical day. **Table 7** shows the 95th percentile and average queue lengths. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. In other words, the 95th-percentile queue is the queue length that has only a 5-percent probability of being exceeded during the analysis time period.

Table 7: Baseline Queue Length Summary - Los Altos Parkway/Vista Boulevard (south)

Intersection	Approach	AM Peak		AM Off-Peak		PM Peak	
		Avg	95%tile	Avg	95%tile	Avg	95%tile
Los Altos Pkwy/Vista Blvd (south)	Westbound	525	853	160	264	250	402

With the baseline traffic volumes, existing lane configurations and signal timings, the worst queuing on the westbound approach would occur during the AM peak hour. The average westbound queue is estimated to be approximately 525 feet during the AM peak hour and 250 feet during the PM peak hour.

PROJECT GENERATED TRAFFIC

Project Description

The project site is located east of Belmar Drive between Platinum Way and Burlington Drive. The location of the project site is shown in **Figure 1**. The proposed project consists of 448 ownership townhome units.

Trip Generation

Trip generation rates for the proposed project were obtained from the Trip Generation Manual, 9th Edition, published by the Institute of Transportation Engineers. **Table 8** provides the Daily, AM peak hour and PM peak hour trip generation calculation details for the proposed project. As shown in **Table 8**, the proposed project is anticipated to generate a total of 2,371 daily trips, 171 AM peak hour trips, and 206 PM peak hour trips. The ITE trip generation manual does not provide any guidance regarding off-peak trip generation. Hence, as a conservative estimate, the AM off-peak trip generation was assumed to be same as the AM peak hour trip generation. Realistically, the AM off-peak trip generation should be considerably lower than the AM peak hour trip generation.

Table 8: Trip Generation Estimates

ITE Land Use (#)	Size (units)	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
230 - Residential Condominium/Townhouse	448	2,371	171	29	142	206	138	68

Project Access

Access to the project site will be provided via a new Project Access Road that will connect to Belmar Drive. The Project Access Road/Belmar Drive intersection will be full-access, allowing for all possible movements, with STOP control on the Project Access Road approach.

Trip Distribution and Assignment

Traffic generated by the project was distributed to the road network based on the location of the project site, major activity centers, the access connection points to arterial roadways, and discussions with City of Sparks staff.

The following trip distribution percentages were used for distributing the project traffic:

- 60% to/from the south via Vista Boulevard
- 10% to/from the north via Vista Boulevard
- 30% to/from the west via Los Altos Parkway

Project generated trips were assigned to the adjacent roadway system based on the distributions outlined above. The project trip assignment is shown on **Figure 5**, attached.

EXISTING PLUS PROJECT CONDITIONS

Traffic Volumes

Plus project traffic volumes were developed by adding the project generated trips (**Figure 5**) to the baseline traffic volumes (**Figure 4**) and are shown on **Figure 6**, attached. The "Plus Project" condition Peak Hour Factors (PHF) and travel patterns were assumed to remain the same as were observed under existing conditions.

Intersection Level of Service Analysis

Table 9 presents the level of service analysis summary for the "Plus Project" scenario assuming the existing intersection configurations. Detailed calculation sheets are provided in **Appendix C**, attached.

Table 9: Plus Project Intersection Level of Service Summary

Intersection	AM Peak		AM Off-Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay
Los Altos Pkwy/Vista Blvd (south)	D	35.5	C	29.5	C	29.4
Los Altos Pkwy/Belmar Dr	A	8.6	A	7.2	B	10.4
Belmar Dr/Project Dwy	B	10.8	B	10.9	B	11.2
Los Altos Pkwy/Vista Heights Dr	A	7.1	A	4.9	A	6.9
Los Altos Pkwy/Vista Blvd (north)	C	26.9	C	21.4	D	36.9

All the study intersections are anticipated to operate at acceptable LOS conditions even with the addition of the project traffic. During the AM peak hour and off-peak AM, the increase in average delay does not exceed 3 seconds per vehicle at any intersection. During the PM peak hour, the average delay is not anticipated to increase by more than 4 seconds per vehicle at any intersection. LOS at the Los Altos Parkway/Vista Boulevard (north & south) intersections declines from LOS "C" to LOS "D" with the project.

Roadway Level of Service

Table 10 summarizes the "Plus Project" conditions roadway level of service.

Table 10: Plus Project Conditions Road Segment Level of Service Summary

Class	Segment	# Lanes	Plus Project	
			Daily Volume	LOS
MAC	Los Altos Parkway south of Belmar Drive	2	12,616	C

As shown in **Table 10**, Los Altos Parkway south of Belmar Drive will operate at acceptable LOS conditions during the "Plus Project" scenario. The roadway LOS remains unchanged (LOS "C") after addition of the project traffic.

Queue Length Analysis

A micro-simulation analysis was performed to estimate the "Plus Project" conditions queue lengths. **Table 11** summarizes the average and 95th percentile queue lengths.

Table 11: Plus Project Queue Length Summary - Los Altos Parkway/Vista Boulevard (south)

Intersection	Approach	Scenario	AM Peak		AM Off-Peak		PM Peak	
			Avg	95%tile	Avg	95%tile	Avg	95%tile
Los Altos Pkwy/Vista Blvd (south)	Westbound	Baseline	525	853	160	264	250	402
Los Altos Pkwy/Vista Blvd (south)	Westbound	Plus Project	716	1302	238	422	320	543

With the addition of the project traffic, during the AM peak hour, the average queue length on the westbound approach at the Los Altos Parkway/Vista Boulevard (south) intersection is anticipated to increase by approximately 449 feet compared to the baseline conditions. The average westbound queue length during the AM peak hour, with the existing lane configuration, is anticipated to be approximately 725 feet. The average queue lengths during the AM off-peak and PM peak hours are anticipated to increase by approximately 70 to 80 feet compared to the baseline conditions.

2035 ROADWAY ANALYSIS

Traffic volumes in the broader study area are anticipated to increase in the future as more development occurs in east Sparks. However, potential future traffic generated by all of the approved but unbuilt housing units in the immediate project vicinity have been included in the Baseline Conditions. Very little additional traffic volume growth is anticipated to occur on Belmar Drive or Los Altos Parkway. Hence, no additional growth rates were applied for 2035 roadway segment analysis as discussed and agreed with City of Sparks staff.

Table 12 summarizes the 2035 roadway segment level of service analysis.

Table 12: 2035 Road Segment Level of Service Summary

Class	Segment	# Lanes	2035	
			Daily Volume	LOS
MAC	Los Altos Parkway south of Belmar Drive	2	12,616	C
MAC	Los Altos Parkway north of Belmar Drive	2	8,212	C

As shown in **Table 12**, Los Altos Parkway south of Belmar Drive and Los Altos Parkway north of Belmar Drive are anticipated to operate at acceptable LOS conditions in the year 2035. The roadway LOS remains unchanged after the addition of the project traffic.

MITIGATION MEASURES

Although the Los Altos Parkway/Vista Boulevard (south) intersection is anticipated to operate at acceptable level of service conditions during the "Plus Project" conditions, the queue length analysis shows that the proposed project will contribute to excessive westbound queuing during the AM peak hour. During the highest AM peak hour, the average queue length is estimated to extend up to 725 feet, with existing lane configuration.

In order to keep the westbound queue within reasonable limits, without affecting the coordinated through movement on Vista Boulevard, we recommend the following improvements:

- Extend the westbound left-turn pocket to have approximately 400 feet of storage (an increase from 120 feet of existing left-turn pocket) as shown in **Exhibit 1**.

Exhibit 1

- Increase the green time for the westbound approach keeping the same cycle length and offset as exists today. This can be achieved by reducing the green time for the eastbound approach by 11 seconds and allocating it to the westbound movement. The suggested change in the splits is shown in **Exhibit 2**.

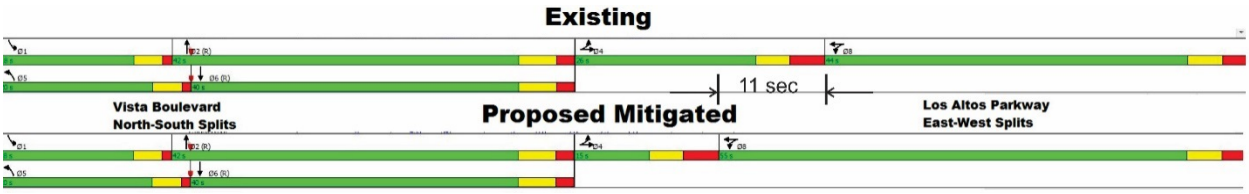


Exhibit 2

With the above two improvements, the resulting westbound queue length is considerably reduced. **Table 12** shows the queue length comparisons**.**

Table 12: Queue Length Comparison - Los Altos Parkway/Vista Boulevard (south)

Intersection	Approach	Scenario	AM Peak		AM Off-Peak		PM Peak	
			Avg	95%tile	Avg	95%tile	Avg	95%tile
Los Altos Pkwy/Vista Blvd (south)	Westbound	Baseline	525	853	160	264	250	402
Los Altos Pkwy/Vista Blvd (south)	Westbound	Plus Project	716	1302	238	422	320	543
Los Altos Pkwy/Vista Blvd (south)	Westbound	Plus Project - Mitigated	300	421	234	242	266	291

As shown in **Table 12**, the queue length on the westbound approach is significantly reduced by extending the westbound left-turn pocket and optimizing east-west green times. The average queues are anticipated to be under 300 feet with extended left-turn storage, during both the peak and non-peak hours.

CONCLUSIONS & RECOMMENDATIONS

The following is a list of our key findings and recommendations to best manage the traffic generated by the proposed project:

Project Trips: The proposed project is anticipated to generate a total of 2,371 daily trips, 171 AM peak hour trips, and 206 PM peak hour trips. The ITE trip generation manual does not provide any guidance regarding off-peak trip generation. Hence, as a conservative estimate, the AM off-peak trip generation was assumed to be the same as the trip generation during the AM peak hour.

Project Access: Access to the project site will be provided via a new Project Access Road that connects to Belmar Drive. The Project Access Road/Belmar Drive intersection will be full-access, allowing for all possible movements, with STOP control on the Project Access Road approach. A single lane approach is sufficient.

Existing/Baseline Level of Service: All the study intersections operate at acceptable levels of service during both the AM and PM peak hours. During the baseline AM peak hour conditions the westbound average queue at the Los Altos Parkway/Vista Boulevard (south) intersection is anticipated to exceed 500 feet.

Plus Project Level of Service: With the addition of the project traffic, all the study intersections continue to operate at acceptable Level of Service (LOS) conditions during the AM and PM peak hours, and AM off-peak hour. However, excessive queuing is anticipated to occur at the at the Los Altos Parkway/Vista Boulevard (south) intersection. With the addition of the project traffic, the average westbound queue length is anticipated be approximately 725 feet during the AM peak hour, with the existing lane configuration.

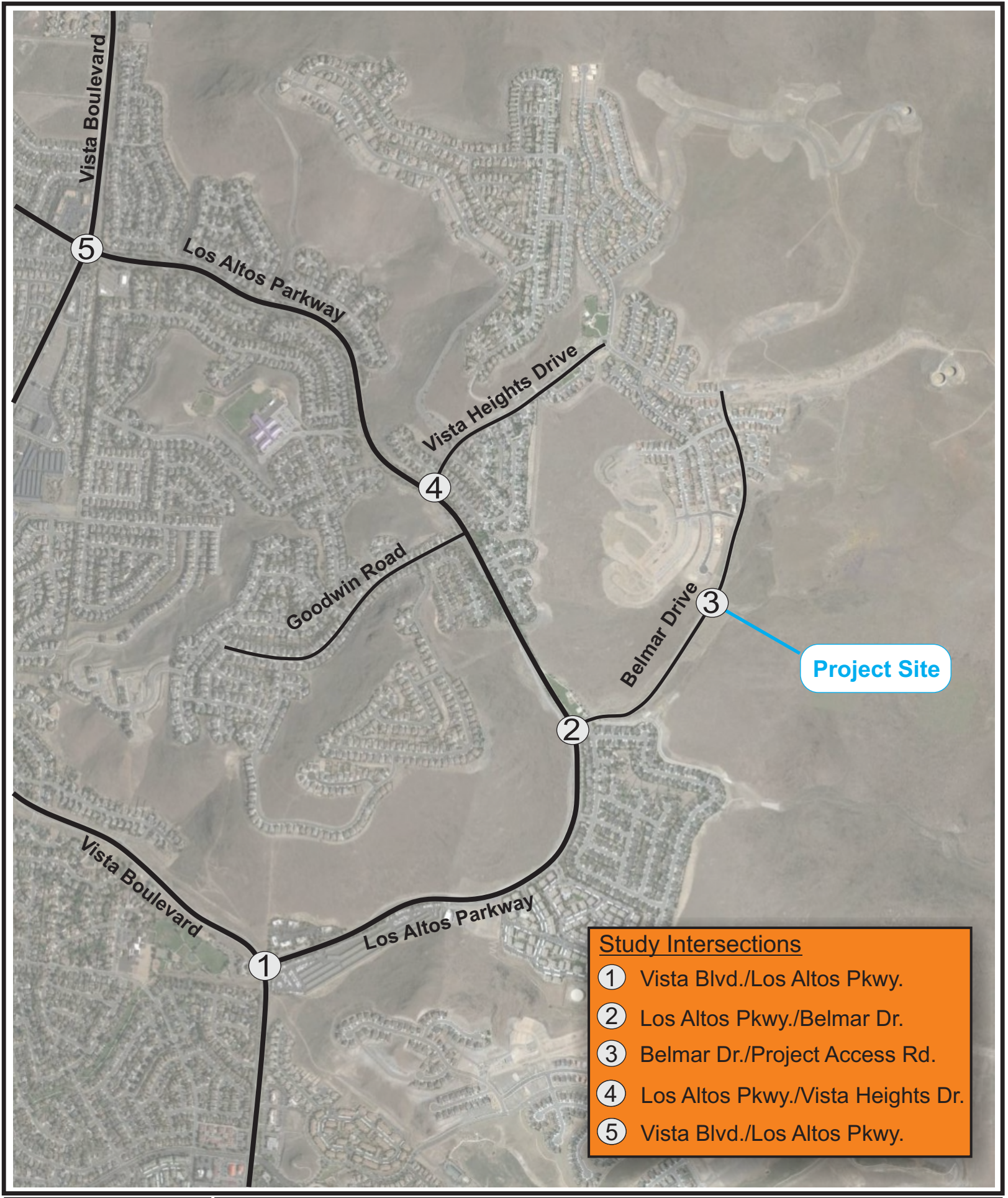
Mitigation Measures: The following two improvements are recommend to mitigate the westbound queuing issues at the Los Altos Parkway/Vista Boulevard (south) intersection:

- Extend the westbound left-turn pocket (on Los Altos Parkway) to approximately 400 feet of striped storage length.
- Optimize the green times allocated to the side street movements (eastbound and westbound).

No other mitigations are proposed at any other study intersections since the analysis shows that the anticipated project traffic does not cause any other significant impacts requiring mitigation.

2035 Roadway Level of Service: The Los Altos Parkway south of Belmar Drive road segment and Los Altos Parkway north of Belmar Drive road segment are anticipated to operate at LOS "C" under 2035 conditions. The roadway segment LOS is anticipated to be the same with or without project. A two-lane facility is shown to provide sufficient capacity (LOS "C") on Los Altos Parkway through the year 2035.

Regional Road Impact Fees: The project's contribution of standard Regional Road Impact Fees will mitigate the minor project effects on the overall roadway network.



TRAFFIC WORKS LLC

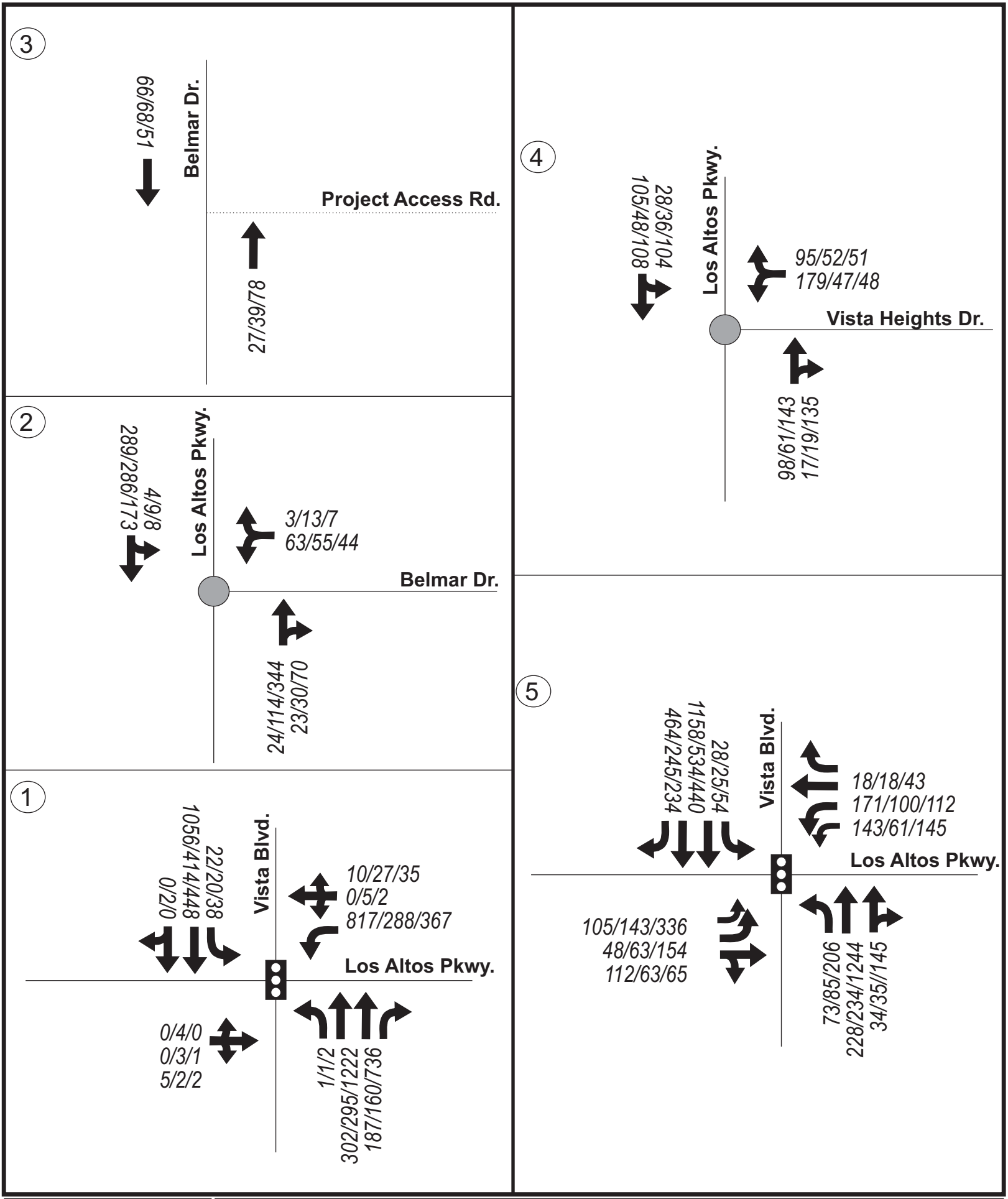
- Study Intersection

N

NO SCALE

Figure 1

MIRAMONTE
TRAFFIC IMPACT STUDY
Study Area



TRAFFIC WORKS LLC

LEGEND

AM/AM Off-Peak/PM - Traffic Volumes

- Lane Configuration

- Traffic Signal

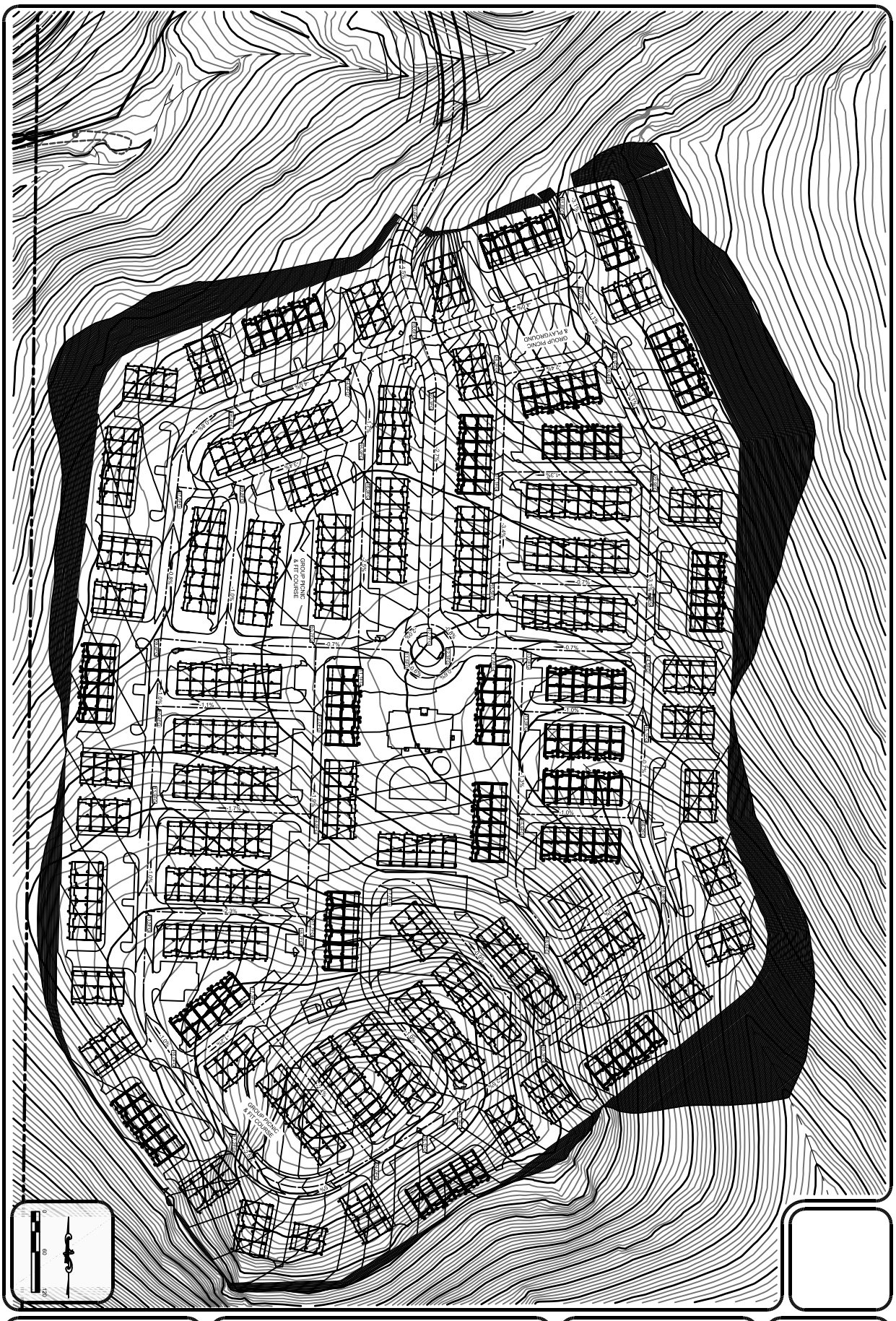
STOP - Stop Sign

- Roundabout

NO SCALE

Figure 2

MIRAMONTE
TRAFFIC IMPACT STUDY
Existing Traffic Volumes



BASEMAP
MIRAMONTE TOWNHOME
GRADING CONCEPT
SPARKS — A PORTION OF SEC 25 T20N R20E, MDM — NEVADA

PLACES Consulting Services, Inc.
PLANNING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SERVICES
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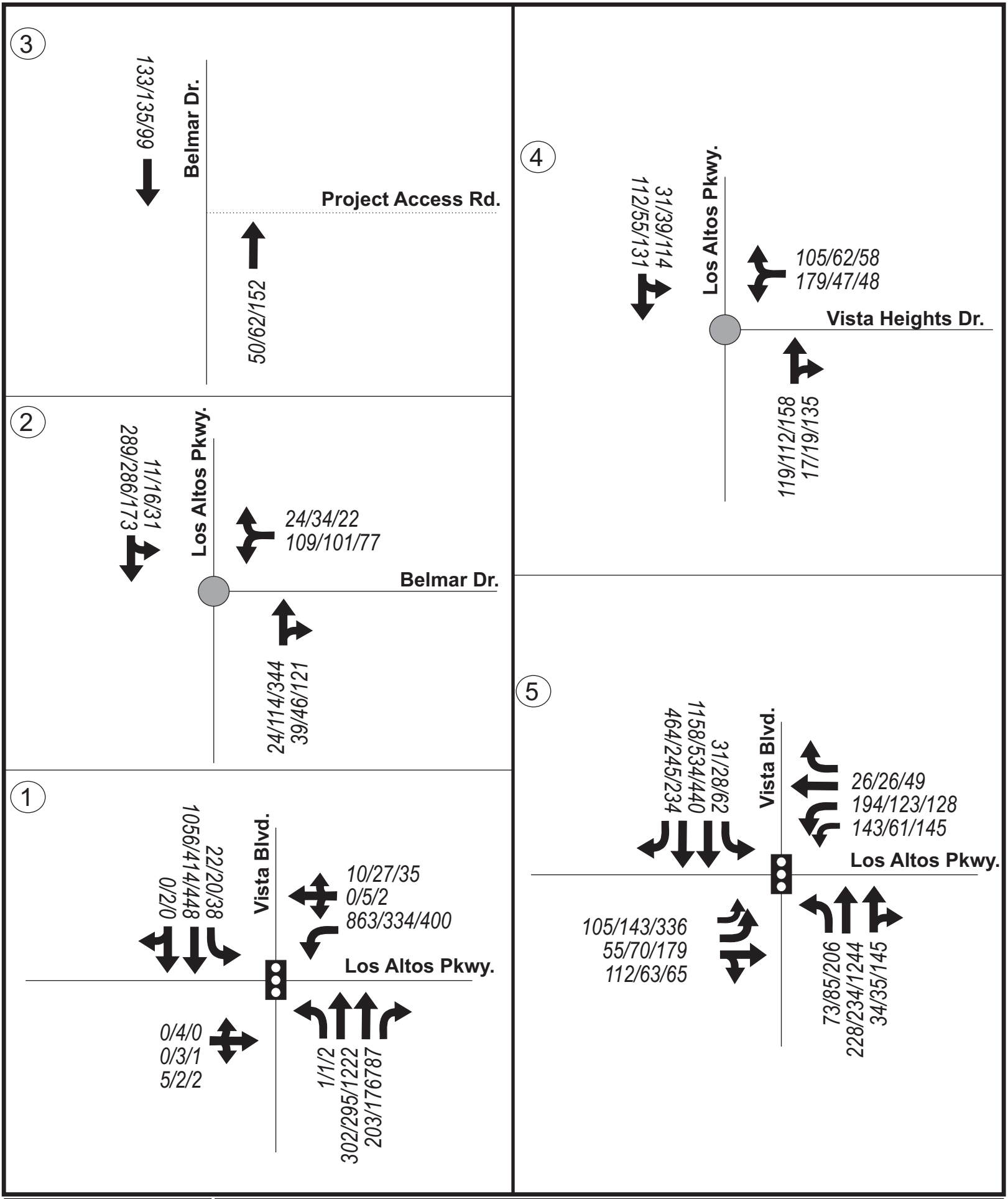
project no:
sheet 1 of 1
date: 09/06/16
designed by: SRD
checked by: ?

TRAFFIC WORKS LLC

Figure 3
MIRAMONTE
TRAFFIC IMPACT STUDY
Site Plan



TRAFFIC WORKS LLC

LEGEND

AM/AM Off-Peak/PM - Traffic Volumes

- Lane Configuration

- Traffic Signal

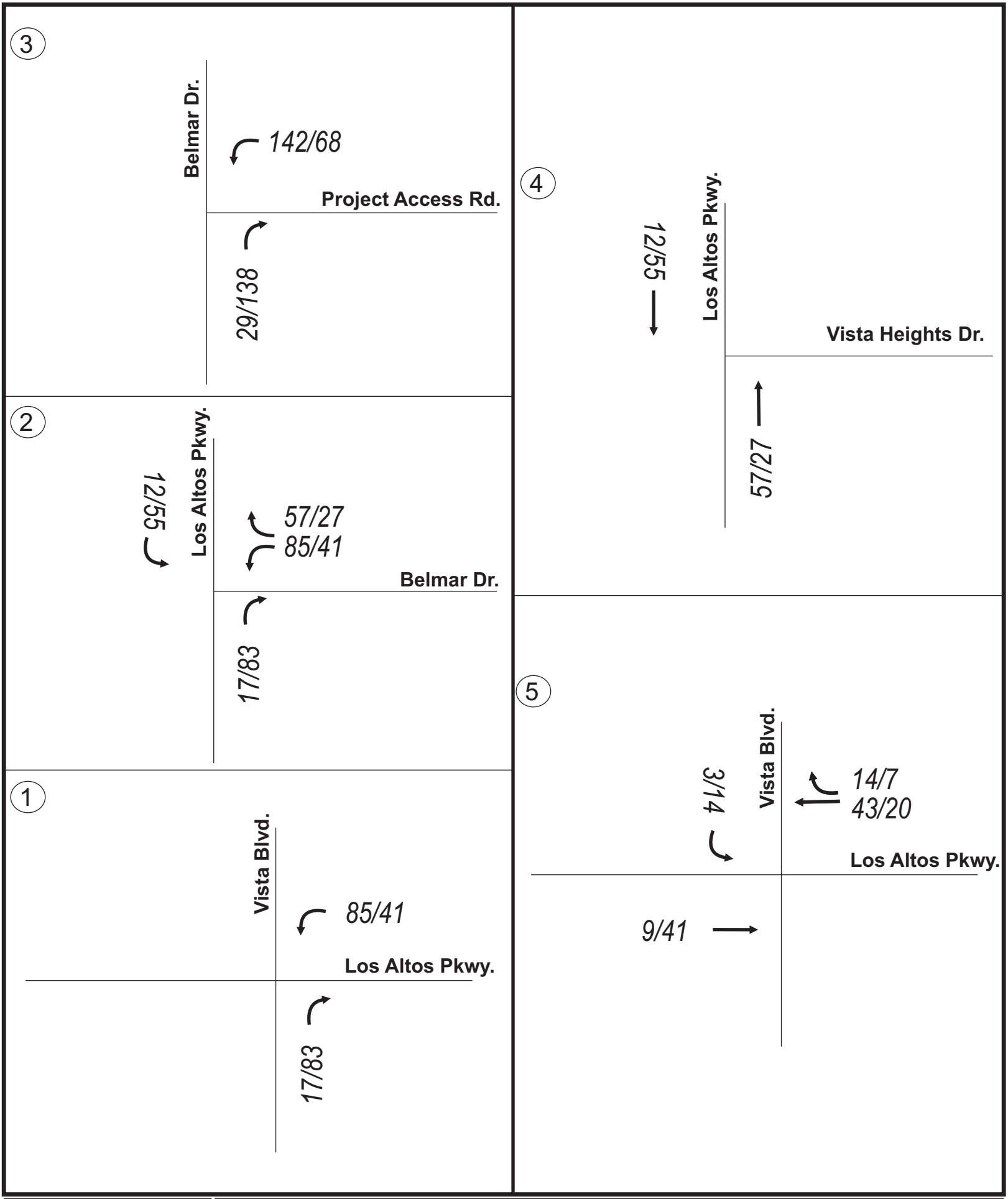
STOP - Stop Sign

- Roundabout

NO SCALE

Figure 4

MIRAMONTE
TRAFFIC IMPACT STUDY
Baseline Traffic Volumes



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LEGEND

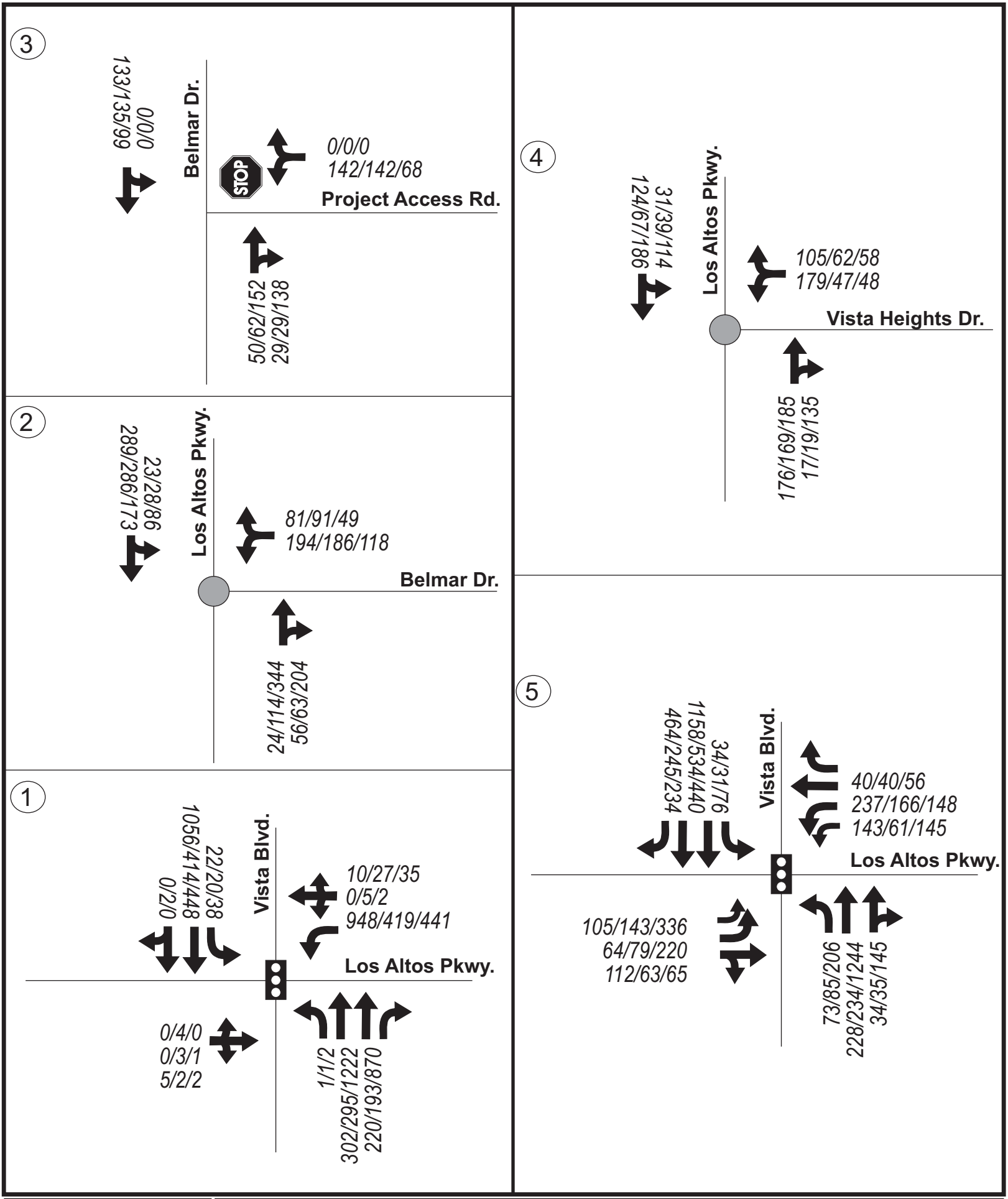
AM/PM - Trip Assignment

N

NO SCALE

Figure 5

MIRAMONTE
TRAFFIC IMPACT STUDY
Project Trips



TRAFFIC WORKS LLC

LEGEND

AM/AM Off-Peak/PM - Traffic Volumes

- Lane Configuration

- Traffic Signal

STOP - Stop Sign

- Roundabout

NO SCALE

Figure 6

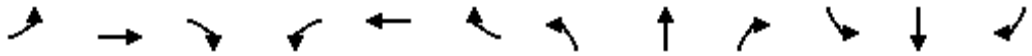
MIRAMONTE

TRAFFIC IMPACT STUDY

Plus Project Traffic Volumes

Appendix A

Existing Conditions LOS Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	817	0	10	1	302	187	22	1056	0
Future Volume (vph)	0	0	5	817	0	10	1	302	187	22	1056	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1627		1698	1698		1787	3574	1599	1787	3574	
Flt Permitted		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1627		1698	1698		1787	3574	1599	1787	3574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	5	888	0	11	1	328	203	24	1148	0
RTOR Reduction (vph)	0	5	0	0	80	0	0	0	110	0	0	0
Lane Group Flow (vph)	0	0	0	453	366	0	1	328	93	24	1148	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		0.9		42.0	42.0		1.0	59.4	59.4	4.4	62.8	
Effective Green, g (s)		0.9		42.0	42.0		1.0	59.4	59.4	4.4	62.8	
Actuated g/C Ratio		0.01		0.32	0.32		0.01	0.46	0.46	0.03	0.48	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		11		548	548		13	1633	730	60	1726	
v/s Ratio Prot		c0.00		c0.27	0.22		0.00	0.09		c0.01	c0.32	
v/s Ratio Perm									0.06			
v/c Ratio		0.00		0.83	0.67		0.08	0.20	0.13	0.40	0.67	
Uniform Delay, d1		64.1		40.6	38.0		64.0	21.1	20.4	61.5	25.6	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		9.4	2.4		0.9	0.3	0.4	1.6	2.0	
Delay (s)		64.1		50.1	40.4		65.0	21.4	20.7	63.1	27.6	
Level of Service		E		D	D		E	C	C	E	C	
Approach Delay (s)		64.1			45.3			21.2			28.4	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

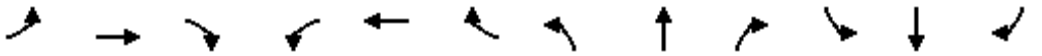
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	93	66	413
Demand Flow Rate, veh/h	94	66	417
Vehicles Circulating, veh/h	34	6	90
Vehicles Exiting, veh/h	38	501	38
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.1	3.7	7.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	94	66	417
Cap Entry Lane, veh/h	1092	1123	1033
Entry HV Adj Factor	0.989	0.995	0.990
Flow Entry, veh/h	93	66	413
Cap Entry, veh/h	1081	1117	1023
V/C Ratio	0.086	0.059	0.404
Control Delay, s/veh	4.1	3.7	7.9
LOS	A	A	A
95th %tile Queue, veh	0	0	2

Intersection	
Intersection Delay, s/veh	6.4
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	347	146	168
Demand Flow Rate, veh/h	350	147	169
Vehicles Circulating, veh/h	125	35	229
Vehicles Exiting, veh/h	57	363	246
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.4	4.5	5.9
Approach LOS	A	A	A

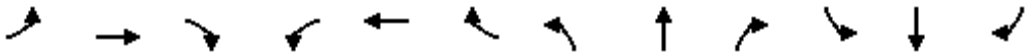
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	350	147	169
Cap Entry Lane, veh/h	997	1091	899
Entry HV Adj Factor	0.991	0.992	0.992
Flow Entry, veh/h	347	146	168
Cap Entry, veh/h	989	1082	892
V/C Ratio	0.351	0.135	0.188
Control Delay, s/veh	7.4	4.5	5.9
LOS	A	A	A
95th %tile Queue, veh	2	0	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	48	112	143	171	18	73	228	34	28	1158	464
Future Volume (vph)	105	48	112	143	171	18	73	228	34	28	1158	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1684		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1684		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	53	124	159	190	20	81	253	38	31	1287	516
RTOR Reduction (vph)	0	84	0	0	0	17	0	8	0	0	0	236
Lane Group Flow (vph)	117	93	0	159	190	3	81	283	0	31	1287	280
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.9	12.8		9.2	15.1	15.1	7.3	57.3		3.6	53.6	53.6
Effective Green, g (s)	6.9	12.8		9.2	15.1	15.1	7.3	57.3		3.6	53.6	53.6
Actuated g/C Ratio	0.07	0.13		0.09	0.15	0.15	0.07	0.58		0.04	0.54	0.54
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	241	217		322	287	244	131	2030		65	1936	866
v/s Ratio Prot	0.03	0.06		c0.05	c0.10		c0.05	c0.08		0.02	c0.36	
v/s Ratio Perm						0.00						0.17
v/c Ratio	0.49	0.43		0.49	0.66	0.01	0.62	0.14		0.48	0.66	0.32
Uniform Delay, d1	44.3	39.7		42.6	39.5	35.6	44.4	9.5		46.7	16.2	12.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	1.4		1.2	5.6	0.0	8.4	0.1		5.4	1.8	1.0
Delay (s)	45.8	41.1		43.8	45.1	35.6	52.9	9.7		52.2	18.0	13.6
Level of Service	D	D		D	D	D	D	A		D	B	B
Approach Delay (s)		43.0			44.1			19.1			17.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	3	2	288	5	27	1	295	160	20	414	2
Future Volume (vph)	4	3	2	288	5	27	1	295	160	20	414	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.97		1.00	0.97		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785		1698	1675		1072	2859	1583	1787	3572	
Flt Permitted		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1785		1698	1675		1072	2859	1583	1787	3572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	3	2	313	5	29	1	321	174	22	450	2
RTOR Reduction (vph)	0	2	0	0	7	0	0	0	63	0	0	0
Lane Group Flow (vph)	0	7	0	175	165	0	1	321	111	22	452	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.3		18.1	18.1		1.1	83.0	83.0	4.3	86.2	
Effective Green, g (s)		1.3		18.1	18.1		1.1	83.0	83.0	4.3	86.2	
Actuated g/C Ratio		0.01		0.14	0.14		0.01	0.64	0.64	0.03	0.66	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		17		236	233		9	1825	1010	59	2368	
v/s Ratio Prot		c0.00		c0.10	0.10		0.00	0.11		c0.01	c0.13	
v/s Ratio Perm									0.07			
v/c Ratio		0.41		0.74	0.71		0.11	0.18	0.11	0.37	0.19	
Uniform Delay, d1		64.0		53.7	53.4		64.0	9.6	9.1	61.5	8.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.8		10.4	7.8		2.0	0.2	0.2	1.4	0.2	
Delay (s)		69.8		64.1	61.2		66.0	9.8	9.4	63.0	8.6	
Level of Service		E		E	E		E	A	A	E	A	
Approach Delay (s)		69.8			62.7			9.7			11.1	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	5.7
Intersection LOS	A

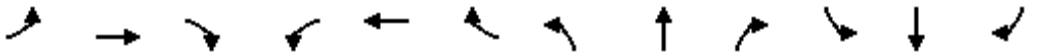
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	78	164	335
Demand Flow Rate, veh/h	79	165	338
Vehicles Circulating, veh/h	131	10	64
Vehicles Exiting, veh/h	44	392	146
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	4.4	4.5	6.6
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	79	165	338
Cap Entry Lane, veh/h	991	1119	1060
Entry HV Adj Factor	0.987	0.992	0.990
Flow Entry, veh/h	78	164	335
Cap Entry, veh/h	978	1110	1050
V/C Ratio	0.080	0.147	0.319
Control Delay, s/veh	4.4	4.5	6.6
LOS	A	A	A
95th %tile Queue, veh	0	1	1

Intersection	
Intersection Delay, s/veh	4.2
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	110	89	93
Demand Flow Rate, veh/h	112	90	94
Vehicles Circulating, veh/h	69	40	53
Vehicles Exiting, veh/h	61	107	128
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.4	4.1	4.1
Approach LOS	A	A	A

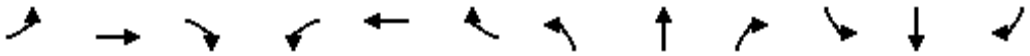
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	112	90	94
Cap Entry Lane, veh/h	1055	1086	1072
Entry HV Adj Factor	0.982	0.992	0.994
Flow Entry, veh/h	110	89	93
Cap Entry, veh/h	1036	1077	1066
V/C Ratio	0.106	0.083	0.088
Control Delay, s/veh	4.4	4.1	4.1
LOS	A	A	A
95th %tile Queue, veh	0	0	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	63	63	61	100	18	85	234	35	25	534	245
Future Volume (vph)	143	63	63	61	100	18	85	234	35	25	534	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.93		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1740		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1740		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	154	68	68	66	108	19	91	252	38	27	574	263
RTOR Reduction (vph)	0	49	0	0	0	17	0	8	0	0	0	139
Lane Group Flow (vph)	154	87	0	66	108	2	91	282	0	27	574	124
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.7	11.1		4.3	7.7	7.7	6.8	38.6		2.3	34.1	34.1
Effective Green, g (s)	7.7	11.1		4.3	7.7	7.7	6.8	38.6		2.3	34.1	34.1
Actuated g/C Ratio	0.11	0.15		0.06	0.11	0.11	0.09	0.53		0.03	0.47	0.47
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	369	267		206	200	170	168	1870		56	1685	754
v/s Ratio Prot	c0.04	c0.05		0.02	c0.06		c0.05	0.08		0.02	c0.16	
v/s Ratio Perm						0.00						0.08
v/c Ratio	0.42	0.33		0.32	0.54	0.01	0.54	0.15		0.48	0.34	0.16
Uniform Delay, d1	30.2	27.3		32.6	30.6	28.9	31.3	8.5		34.4	12.0	10.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.7		0.9	3.0	0.0	3.5	0.2		6.4	0.6	0.5
Delay (s)	31.0	28.0		33.5	33.6	28.9	34.8	8.7		40.8	12.6	11.4
Level of Service	C	C		C	C	C	C	A		D	B	B
Approach Delay (s)		29.6			33.1			14.9			13.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	2	367	2	35	2	1222	736	38	448	0
Future Volume (vph)	0	1	2	367	2	35	2	1222	736	38	448	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.91		1.00	0.97		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1712		1698	1672		1072	2859	1583	1787	3574	
Flt Permitted		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1712		1698	1672		1072	2859	1583	1787	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	2	386	2	37	2	1286	775	40	472	0
RTOR Reduction (vph)	0	2	0	0	5	0	0	0	282	0	0	0
Lane Group Flow (vph)	0	1	0	216	204	0	2	1286	493	40	472	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.1		23.3	23.3		1.2	95.4	95.4	6.9	101.1	
Effective Green, g (s)		1.1		23.3	23.3		1.2	95.4	95.4	6.9	101.1	
Actuated g/C Ratio		0.01		0.16	0.16		0.01	0.64	0.64	0.05	0.67	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		12		263	259		8	1818	1006	82	2408	
v/s Ratio Prot		c0.00		c0.13	0.12		0.00	c0.45		c0.02	0.13	
v/s Ratio Perm									0.31			
v/c Ratio		0.08		0.82	0.79		0.25	0.71	0.49	0.49	0.20	
Uniform Delay, d1		73.9		61.3	61.0		74.0	18.1	14.4	69.8	9.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1		17.5	13.5		5.9	2.4	1.7	1.7	0.2	
Delay (s)		75.1		78.8	74.5		79.8	20.4	16.1	71.5	9.4	
Level of Service		E		E	E		E	C	B	E	A	
Approach Delay (s)		75.1			76.7			18.9			14.2	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.0
Intersection LOS	A

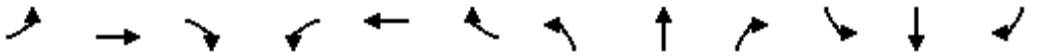
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	60	487	213
Demand Flow Rate, veh/h	61	492	215
Vehicles Circulating, veh/h	409	9	53
Vehicles Exiting, veh/h	92	259	417
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	5.7	8.0	5.2
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	61	492	215
Cap Entry Lane, veh/h	751	1120	1072
Entry HV Adj Factor	0.984	0.990	0.991
Flow Entry, veh/h	60	487	213
Cap Entry, veh/h	738	1108	1061
V/C Ratio	0.081	0.439	0.201
Control Delay, s/veh	5.7	8.0	5.2
LOS	A	A	A
95th %tile Queue, veh	0	2	1

Intersection	
Intersection Delay, s/veh	6.1
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	114	319	244
Demand Flow Rate, veh/h	116	323	246
Vehicles Circulating, veh/h	166	121	56
Vehicles Exiting, veh/h	278	181	226
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.0	7.0	5.6
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	116	323	246
Cap Entry Lane, veh/h	957	1001	1068
Entry HV Adj Factor	0.983	0.989	0.991
Flow Entry, veh/h	114	319	244
Cap Entry, veh/h	941	990	1059
V/C Ratio	0.121	0.323	0.230
Control Delay, s/veh	5.0	7.0	5.6
LOS	A	A	A
95th %tile Queue, veh	0	1	1



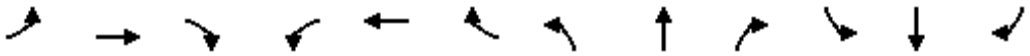
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	154	65	145	112	43	206	1244	145	54	440	234
Future Volume (vph)	336	154	65	145	112	43	206	1244	145	54	440	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1797		3467	1881	1599	1787	3518		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1797		3467	1881	1599	1787	3518		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	361	166	70	156	120	46	222	1338	156	58	473	252
RTOR Reduction (vph)	0	16	0	0	0	40	0	6	0	0	0	153
Lane Group Flow (vph)	361	220	0	156	120	6	222	1488	0	58	473	99
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.1	17.7		9.0	13.6	13.6	16.8	51.4		3.9	38.5	38.5
Effective Green, g (s)	13.1	17.7		9.0	13.6	13.6	16.8	51.4		3.9	38.5	38.5
Actuated g/C Ratio	0.13	0.18		0.09	0.14	0.14	0.17	0.52		0.04	0.39	0.39
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	463	324		318	261	221	306	1845		71	1404	628
v/s Ratio Prot	c0.10	c0.12		0.04	0.06		c0.12	c0.42		0.03	0.13	
v/s Ratio Perm						0.00						0.06
v/c Ratio	0.78	0.68		0.49	0.46	0.03	0.73	0.81		0.82	0.34	0.16
Uniform Delay, d1	41.1	37.5		42.3	38.8	36.5	38.4	19.2		46.7	20.8	19.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.1	5.8		1.2	1.3	0.1	8.3	3.9		49.3	0.6	0.5
Delay (s)	49.2	43.3		43.5	40.1	36.5	46.7	23.1		96.0	21.5	19.8
Level of Service	D	D		D	D	D	D	C		F	C	B
Approach Delay (s)		46.8			41.2			26.1			26.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix B

Baseline Conditions LOS Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	863	0	10	1	302	203	22	1056	0
Future Volume (vph)	0	0	5	863	0	10	1	302	203	22	1056	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1627		1698	1698		1787	3574	1599	1787	3574	
Flt Permitted		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1627		1698	1698		1787	3574	1599	1787	3574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	5	938	0	11	1	328	221	24	1148	0
RTOR Reduction (vph)	0	5	0	0	77	0	0	0	125	0	0	0
Lane Group Flow (vph)	0	0	0	478	394	0	1	328	96	24	1148	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		0.9		44.8	44.8		1.0	56.6	56.6	4.4	60.0	
Effective Green, g (s)		0.9		44.8	44.8		1.0	56.6	56.6	4.4	60.0	
Actuated g/C Ratio		0.01		0.34	0.34		0.01	0.44	0.44	0.03	0.46	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		11		585	585		13	1556	696	60	1649	
v/s Ratio Prot		c0.00		c0.28	0.23		0.00	0.09		c0.01	c0.32	
v/s Ratio Perm									0.06			
v/c Ratio		0.00		0.82	0.67		0.08	0.21	0.14	0.40	0.70	
Uniform Delay, d1		64.1		38.9	36.3		64.0	22.8	22.0	61.5	27.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		8.2	2.4		0.9	0.3	0.4	1.6	2.5	
Delay (s)		64.1		47.1	38.8		65.0	23.1	22.5	63.1	30.2	
Level of Service		E		D	D		E	C	C	E	C	
Approach Delay (s)		64.1			42.9			22.9			30.9	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

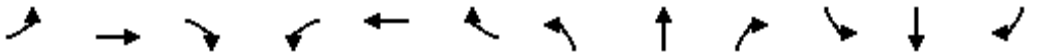
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	188	89	422
Demand Flow Rate, veh/h	190	90	426
Vehicles Circulating, veh/h	34	15	156
Vehicles Exiting, veh/h	71	567	68
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.9	4.0	8.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	190	90	426
Cap Entry Lane, veh/h	1092	1113	967
Entry HV Adj Factor	0.989	0.985	0.990
Flow Entry, veh/h	188	89	422
Cap Entry, veh/h	1081	1097	957
V/C Ratio	0.174	0.081	0.441
Control Delay, s/veh	4.9	4.0	8.9
LOS	A	A	A
95th %tile Queue, veh	1	0	2

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	360	173	181
Demand Flow Rate, veh/h	363	175	182
Vehicles Circulating, veh/h	153	39	229
Vehicles Exiting, veh/h	61	372	287
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.8	4.8	6.1
Approach LOS	A	A	A

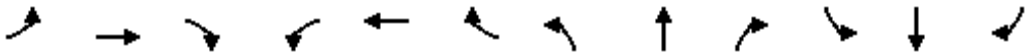
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	363	175	182
Cap Entry Lane, veh/h	970	1087	899
Entry HV Adj Factor	0.992	0.991	0.992
Flow Entry, veh/h	360	173	181
Cap Entry, veh/h	962	1077	892
V/C Ratio	0.374	0.161	0.203
Control Delay, s/veh	7.8	4.8	6.1
LOS	A	A	A
95th %tile Queue, veh	2	1	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	55	112	143	194	26	73	228	34	31	1158	464
Future Volume (vph)	105	55	112	143	194	26	73	228	34	31	1158	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1692		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1692		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	61	124	159	216	29	81	253	38	34	1287	516
RTOR Reduction (vph)	0	71	0	0	0	24	0	8	0	0	0	238
Lane Group Flow (vph)	117	114	0	159	216	5	81	283	0	34	1287	278
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.9	14.2		9.2	16.5	16.5	7.4	57.4		3.6	53.6	53.6
Effective Green, g (s)	6.9	14.2		9.2	16.5	16.5	7.4	57.4		3.6	53.6	53.6
Actuated g/C Ratio	0.07	0.14		0.09	0.16	0.16	0.07	0.57		0.04	0.53	0.53
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	238	239		317	309	262	131	2003		64	1908	853
v/s Ratio Prot	0.03	0.07		c0.05	c0.11		c0.05	c0.08		0.02	c0.36	
v/s Ratio Perm						0.00						0.17
v/c Ratio	0.49	0.48		0.50	0.70	0.02	0.62	0.14		0.53	0.67	0.33
Uniform Delay, d1	45.1	39.7		43.4	39.6	35.2	45.1	10.0		47.6	17.0	13.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	1.5		1.3	6.8	0.0	8.4	0.1		8.2	1.9	1.0
Delay (s)	46.7	41.2		44.7	46.4	35.2	53.5	10.2		55.8	19.0	14.2
Level of Service	D	D		D	D	D	D	B		E	B	B
Approach Delay (s)		43.3			44.9			19.6			18.3	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	3	2	334	5	27	1	295	176	20	414	2
Future Volume (vph)	4	3	2	334	5	27	1	295	176	20	414	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785		1698	1678		1072	2859	1583	1787	3572	
Flt Permitted		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1785		1698	1678		1072	2859	1583	1787	3572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	3	2	363	5	29	1	321	191	22	450	2
RTOR Reduction (vph)	0	2	0	0	6	0	0	0	72	0	0	0
Lane Group Flow (vph)	0	7	0	200	191	0	1	321	119	22	452	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.3		20.0	20.0		1.1	81.1	81.1	4.3	84.3	
Effective Green, g (s)		1.3		20.0	20.0		1.1	81.1	81.1	4.3	84.3	
Actuated g/C Ratio		0.01		0.15	0.15		0.01	0.62	0.62	0.03	0.65	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		17		261	258		9	1783	987	59	2316	
v/s Ratio Prot		c0.00		c0.12	0.11		0.00	0.11		c0.01	c0.13	
v/s Ratio Perm									0.08			
v/c Ratio		0.41		0.77	0.74		0.11	0.18	0.12	0.37	0.20	
Uniform Delay, d1		64.0		52.8	52.5		64.0	10.4	9.9	61.5	9.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.8		11.4	9.6		2.0	0.2	0.3	1.4	0.2	
Delay (s)		69.8		64.2	62.1		66.0	10.6	10.2	63.0	9.4	
Level of Service		E		E	E		E	B	B	E	A	
Approach Delay (s)		69.8			63.1			10.5			11.9	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	6.1
Intersection LOS	A

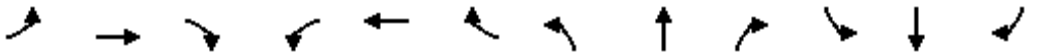
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	154	182	343
Demand Flow Rate, veh/h	155	184	346
Vehicles Circulating, veh/h	131	18	116
Vehicles Exiting, veh/h	71	444	170
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	5.1	4.8	7.2
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	155	184	346
Cap Entry Lane, veh/h	991	1110	1006
Entry HV Adj Factor	0.994	0.988	0.991
Flow Entry, veh/h	154	182	343
Cap Entry, veh/h	984	1096	997
V/C Ratio	0.156	0.166	0.344
Control Delay, s/veh	5.1	4.8	7.2
LOS	A	A	A
95th %tile Queue, veh	1	1	2

Intersection	
Intersection Delay, s/veh	4.5
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	121	145	104
Demand Flow Rate, veh/h	123	146	105
Vehicles Circulating, veh/h	125	43	53
Vehicles Exiting, veh/h	64	115	195
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.8	4.6	4.2
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	123	146	105
Cap Entry Lane, veh/h	997	1082	1072
Entry HV Adj Factor	0.984	0.992	0.994
Flow Entry, veh/h	121	145	104
Cap Entry, veh/h	981	1073	1065
V/C Ratio	0.123	0.135	0.098
Control Delay, s/veh	4.8	4.6	4.2
LOS	A	A	A
95th %tile Queue, veh	0	0	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	70	63	61	123	26	85	234	35	38	534	245
Future Volume (vph)	143	70	63	61	123	26	85	234	35	38	534	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.93		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1747		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1747		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	154	75	68	66	132	28	91	252	38	41	574	263
RTOR Reduction (vph)	0	43	0	0	0	25	0	9	0	0	0	141
Lane Group Flow (vph)	154	100	0	66	132	3	91	281	0	41	574	122
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.7	12.0		4.2	8.5	8.5	6.8	36.9		3.4	33.5	33.5
Effective Green, g (s)	7.7	12.0		4.2	8.5	8.5	6.8	36.9		3.4	33.5	33.5
Actuated g/C Ratio	0.11	0.17		0.06	0.12	0.12	0.09	0.51		0.05	0.46	0.46
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	368	289		200	220	187	167	1783		83	1651	738
v/s Ratio Prot	c0.04	c0.06		0.02	c0.07		c0.05	c0.08		0.02	c0.16	
v/s Ratio Perm						0.00						0.08
v/c Ratio	0.42	0.34		0.33	0.60	0.02	0.54	0.16		0.49	0.35	0.16
Uniform Delay, d1	30.3	26.8		32.8	30.4	28.3	31.4	9.5		33.7	12.5	11.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.7		1.0	4.4	0.0	3.6	0.2		4.6	0.6	0.5
Delay (s)	31.1	27.5		33.8	34.7	28.3	35.0	9.7		38.3	13.1	11.8
Level of Service	C	C		C	C	C	C	A		D	B	B
Approach Delay (s)		29.4			33.7			15.7			13.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	2	400	2	35	2	1222	787	38	448	0
Future Volume (vph)	0	1	2	400	2	35	2	1222	787	38	448	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.91		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1712		1698	1674		1072	2859	1583	1787	3574	
Flt Permitted		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1712		1698	1674		1072	2859	1583	1787	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	2	421	2	37	2	1286	828	40	472	0
RTOR Reduction (vph)	0	2	0	0	5	0	0	0	309	0	0	0
Lane Group Flow (vph)	0	1	0	232	223	0	2	1286	519	40	472	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.1		24.6	24.6		1.2	94.1	94.1	6.9	99.8	
Effective Green, g (s)		1.1		24.6	24.6		1.2	94.1	94.1	6.9	99.8	
Actuated g/C Ratio		0.01		0.16	0.16		0.01	0.63	0.63	0.05	0.67	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		12		278	274		8	1793	993	82	2377	
v/s Ratio Prot		c0.00		c0.14	0.13		0.00	c0.45		c0.02	0.13	
v/s Ratio Perm									0.33			
v/c Ratio		0.08		0.83	0.81		0.25	0.72	0.52	0.49	0.20	
Uniform Delay, d1		73.9		60.7	60.5		74.0	18.9	15.5	69.8	9.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1		18.2	15.9		5.9	2.5	2.0	1.7	0.2	
Delay (s)		75.1		78.9	76.4		79.8	21.4	17.5	71.5	9.9	
Level of Service		E		E	E		E	C	B	E	A	
Approach Delay (s)		75.1			77.7			19.9			14.7	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.0
Intersection LOS	A

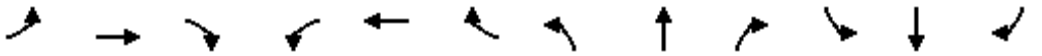
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	117	547	240
Demand Flow Rate, veh/h	118	552	242
Vehicles Circulating, veh/h	409	36	92
Vehicles Exiting, veh/h	179	298	435
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	6.5	9.2	5.8
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	118	552	242
Cap Entry Lane, veh/h	751	1090	1031
Entry HV Adj Factor	0.992	0.991	0.992
Flow Entry, veh/h	117	547	240
Cap Entry, veh/h	744	1080	1022
V/C Ratio	0.157	0.506	0.235
Control Delay, s/veh	6.5	9.2	5.8
LOS	A	A	A
95th %tile Queue, veh	1	3	1

Intersection	
Intersection Delay, s/veh	6.4
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	122	337	282
Demand Flow Rate, veh/h	124	341	285
Vehicles Circulating, veh/h	184	132	56
Vehicles Exiting, veh/h	289	209	252
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.1	7.3	6.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	124	341	285
Cap Entry Lane, veh/h	940	990	1068
Entry HV Adj Factor	0.984	0.989	0.991
Flow Entry, veh/h	122	337	282
Cap Entry, veh/h	925	979	1059
V/C Ratio	0.132	0.344	0.267
Control Delay, s/veh	5.1	7.3	6.0
LOS	A	A	A
95th %tile Queue, veh	0	2	1



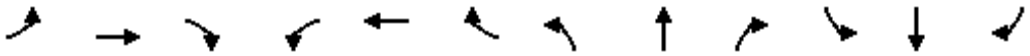
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	179	65	145	128	49	206	1244	145	62	440	234
Future Volume (vph)	336	179	65	145	128	49	206	1244	145	62	440	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1806		3467	1881	1599	1787	3518		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1806		3467	1881	1599	1787	3518		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	361	192	70	156	138	53	222	1338	156	67	473	252
RTOR Reduction (vph)	0	13	0	0	0	45	0	6	0	0	0	154
Lane Group Flow (vph)	361	249	0	156	138	8	222	1488	0	67	473	98
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.0	19.3		9.1	15.4	15.4	17.1	51.2		5.0	39.1	39.1
Effective Green, g (s)	13.0	19.3		9.1	15.4	15.4	17.1	51.2		5.0	39.1	39.1
Actuated g/C Ratio	0.13	0.19		0.09	0.15	0.15	0.17	0.51		0.05	0.39	0.39
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	448	346		313	287	244	303	1790		88	1389	621
v/s Ratio Prot	c0.10	c0.14		0.04	0.07		c0.12	c0.42		0.04	0.13	
v/s Ratio Perm						0.01						0.06
v/c Ratio	0.81	0.72		0.50	0.48	0.03	0.73	0.83		0.76	0.34	0.16
Uniform Delay, d1	42.6	38.1		43.6	38.9	36.3	39.6	21.0		47.2	21.7	20.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.2	7.0		1.3	1.3	0.1	8.8	4.7		31.5	0.7	0.5
Delay (s)	52.7	45.1		44.8	40.2	36.3	48.4	25.7		78.7	22.3	20.6
Level of Service	D	D		D	D	D	D	C		E	C	C
Approach Delay (s)		49.5			41.7			28.6			26.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix C

Plus Project Conditions LOS Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	948	0	10	1	302	220	22	1056	0
Future Volume (vph)	0	0	5	948	0	10	1	302	220	22	1056	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1627		1698	1698		1787	3574	1599	1787	3574	
Flt Permitted		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1627		1698	1698		1787	3574	1599	1787	3574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	5	1030	0	11	1	328	239	24	1148	0
RTOR Reduction (vph)	0	5	0	0	71	0	0	0	147	0	0	0
Lane Group Flow (vph)	0	0	0	525	445	0	1	328	92	24	1148	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		0.9		51.4	51.4		1.0	50.0	50.0	4.4	53.4	
Effective Green, g (s)		0.9		51.4	51.4		1.0	50.0	50.0	4.4	53.4	
Actuated g/C Ratio		0.01		0.40	0.40		0.01	0.38	0.38	0.03	0.41	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		11		671	671		13	1374	615	60	1468	
v/s Ratio Prot		c0.00		c0.31	0.26		0.00	0.09		c0.01	c0.32	
v/s Ratio Perm									0.06			
v/c Ratio		0.00		0.78	0.66		0.08	0.24	0.15	0.40	0.78	
Uniform Delay, d1		64.1		34.4	32.2		64.0	27.1	26.1	61.5	33.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		5.5	1.9		0.9	0.4	0.5	1.6	4.2	
Delay (s)		64.1		39.9	34.1		65.0	27.5	26.6	63.1	37.5	
Level of Service		E		D	C		E	C	C	E	D	
Approach Delay (s)		64.1			37.0			27.2			38.0	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	387	113	439
Demand Flow Rate, veh/h	391	114	443
Vehicles Circulating, veh/h	34	32	276
Vehicles Exiting, veh/h	112	687	149
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.0	4.2	11.3
Approach LOS	A	A	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	391	114	443
Cap Entry Lane, veh/h	1092	1094	857
Entry HV Adj Factor	0.990	0.988	0.991
Flow Entry, veh/h	387	113	439
Cap Entry, veh/h	1081	1082	850
V/C Ratio	0.358	0.104	0.517
Control Delay, s/veh	7.0	4.2	11.3
LOS	A	A	B
95th %tile Queue, veh	2	0	3

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	142	0	50	29	0	133
Future Vol, veh/h	142	0	50	29	0	133
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	154	0	54	32	0	145

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	215	70	0	0	86	0
Stage 1	70	-	-	-	-	-
Stage 2	145	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	775	996	-	-	1517	-
Stage 1	955	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	775	996	-	-	1517	-
Mov Cap-2 Maneuver	775	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	885	-	-	-	-	-

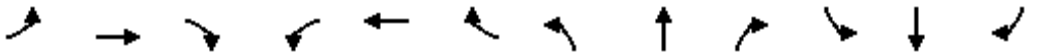
Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	775	-	1517	-
HCM Lane V/C Ratio	-	-	0.199	-	-	-
HCM Control Delay (s)	-	-	10.8	0	0	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.7	-	0	-

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	360	245	204
Demand Flow Rate, veh/h	363	247	206
Vehicles Circulating, veh/h	225	39	229
Vehicles Exiting, veh/h	61	396	359
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.7	5.5	6.4
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	363	247	206
Cap Entry Lane, veh/h	902	1087	899
Entry HV Adj Factor	0.992	0.991	0.992
Flow Entry, veh/h	360	245	204
Cap Entry, veh/h	895	1077	891
V/C Ratio	0.402	0.227	0.229
Control Delay, s/veh	8.7	5.5	6.4
LOS	A	A	A
95th %tile Queue, veh	2	1	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	64	112	143	237	40	73	228	34	34	1158	464
Future Volume (vph)	105	64	112	143	237	40	73	228	34	34	1158	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1702		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1702		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	71	124	159	263	44	81	253	38	38	1287	516
RTOR Reduction (vph)	0	60	0	0	0	36	0	8	0	0	0	218
Lane Group Flow (vph)	117	135	0	159	263	8	81	283	0	38	1287	298
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.9	17.0		9.3	19.4	19.4	7.4	57.4		3.6	53.6	53.6
Effective Green, g (s)	6.9	17.0		9.3	19.4	19.4	7.4	57.4		3.6	53.6	53.6
Actuated g/C Ratio	0.07	0.16		0.09	0.19	0.19	0.07	0.56		0.03	0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	231	280		312	353	300	128	1947		62	1854	829
v/s Ratio Prot	0.03	0.08		c0.05	c0.14		c0.05	c0.08		0.02	c0.36	
v/s Ratio Perm						0.01						0.19
v/c Ratio	0.51	0.48		0.51	0.75	0.03	0.63	0.15		0.61	0.69	0.36
Uniform Delay, d1	46.6	39.2		44.8	39.6	34.2	46.6	11.1		49.2	18.7	14.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	1.3		1.3	8.3	0.0	9.8	0.2		16.6	2.2	1.2
Delay (s)	48.3	40.5		46.1	47.9	34.3	56.4	11.3		65.8	20.9	15.9
Level of Service	D	D		D	D	C	E	B		E	C	B
Approach Delay (s)		43.4			46.0			21.1			20.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	103.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Vista Blvd & Los Altos Pkwy

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LTR	L	T	T	L	T	TR
Maximum Queue (ft)	37	145	1546	5	116	133	299	422	405
Average Queue (ft)	7	141	716	0	50	47	33	255	233
95th Queue (ft)	27	158	1302	3	104	113	132	378	357
Link Distance (ft)	299		3511		2073	2073		1041	1041
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		120		125			275		
Storage Blk Time (%)		23	44		0			6	
Queuing Penalty (veh)		110	210		0			1	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	2	441	2	35	2	1222	870	38	448	0
Future Volume (vph)	0	1	2	441	2	35	2	1222	870	38	448	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.91		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1712		1698	1676		1072	2859	1583	1787	3574	
Flt Permitted		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1712		1698	1676		1072	2859	1583	1787	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	2	464	2	37	2	1286	916	40	472	0
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	354	0	0	0
Lane Group Flow (vph)	0	1	0	255	244	0	2	1286	562	40	472	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.1		26.7	26.7		1.2	92.0	92.0	6.9	97.7	
Effective Green, g (s)		1.1		26.7	26.7		1.2	92.0	92.0	6.9	97.7	
Actuated g/C Ratio		0.01		0.18	0.18		0.01	0.61	0.61	0.05	0.65	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		12		302	298		8	1753	970	82	2327	
v/s Ratio Prot		c0.00		c0.15	0.15		0.00	c0.45		c0.02	0.13	
v/s Ratio Perm									0.35			
v/c Ratio		0.08		0.84	0.82		0.25	0.73	0.58	0.49	0.20	
Uniform Delay, d1		73.9		59.6	59.3		74.0	20.4	17.4	69.8	10.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1		18.3	15.1		5.9	2.8	2.5	1.7	0.2	
Delay (s)		75.1		77.9	74.4		79.8	23.1	19.9	71.5	10.7	
Level of Service		E		E	E		E	C	B	E	B	
Approach Delay (s)		75.1			76.2			21.9			15.5	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	197	645	305
Demand Flow Rate, veh/h	199	651	308
Vehicles Circulating, veh/h	409	102	140
Vehicles Exiting, veh/h	344	346	468
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	7.9	12.8	7.0
Approach LOS	A	B	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	199	651	308
Cap Entry Lane, veh/h	751	1020	982
Entry HV Adj Factor	0.990	0.991	0.990
Flow Entry, veh/h	197	645	305
Cap Entry, veh/h	743	1011	973
V/C Ratio	0.265	0.638	0.314
Control Delay, s/veh	7.9	12.8	7.0
LOS	A	B	A
95th %tile Queue, veh	1	5	1

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	68	0	152	138	0	99
Future Vol, veh/h	68	0	152	138	0	99
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	74	0	165	150	0	108

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	348	240	0	0	315	0
Stage 1	240	-	-	-	-	-
Stage 2	108	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	651	801	-	-	1251	-
Stage 1	802	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	651	801	-	-	1251	-
Mov Cap-2 Maneuver	651	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	919	-	-	-	-	-

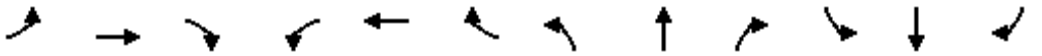
Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	651	-	1251	-
HCM Lane V/C Ratio	-	-	0.114	-	-	-
HCM Control Delay (s)	-	-	11.2	0	0	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	-	0	-

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	122	368	345
Demand Flow Rate, veh/h	124	372	348
Vehicles Circulating, veh/h	215	132	56
Vehicles Exiting, veh/h	289	272	283
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.3	7.7	6.7
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	124	372	348
Cap Entry Lane, veh/h	911	990	1068
Entry HV Adj Factor	0.984	0.989	0.991
Flow Entry, veh/h	122	368	345
Cap Entry, veh/h	897	979	1059
V/C Ratio	0.136	0.376	0.326
Control Delay, s/veh	5.3	7.7	6.7
LOS	A	A	A
95th %tile Queue, veh	0	2	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	220	65	145	148	56	206	1244	145	76	440	234
Future Volume (vph)	336	220	65	145	148	56	206	1244	145	76	440	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1817		3467	1881	1599	1787	3518		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1817		3467	1881	1599	1787	3518		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	361	237	70	156	159	60	222	1338	156	82	473	252
RTOR Reduction (vph)	0	10	0	0	0	49	0	7	0	0	0	157
Lane Group Flow (vph)	361	297	0	156	159	11	222	1487	0	82	473	95
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.1	22.0		9.2	18.1	18.1	17.3	51.2		5.0	38.9	38.9
Effective Green, g (s)	13.1	22.0		9.2	18.1	18.1	17.3	51.2		5.0	38.9	38.9
Actuated g/C Ratio	0.13	0.21		0.09	0.18	0.18	0.17	0.50		0.05	0.38	0.38
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	439	386		308	329	279	298	1741		86	1344	601
v/s Ratio Prot	c0.10	c0.16		0.04	0.08		c0.12	c0.42		0.05	0.13	
v/s Ratio Perm						0.01						0.06
v/c Ratio	0.82	0.77		0.51	0.48	0.04	0.74	0.85		0.95	0.35	0.16
Uniform Delay, d1	44.0	38.3		44.9	38.4	35.4	41.0	22.8		49.1	23.2	21.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.8	8.9		1.3	1.1	0.1	9.7	5.6		81.0	0.7	0.6
Delay (s)	55.8	47.2		46.2	39.6	35.5	50.6	28.4		130.1	23.9	21.9
Level of Service	E	D		D	D	D	D	C		F	C	C
Approach Delay (s)		51.9			41.7			31.3			34.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	103.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Vista Blvd & Los Altos Pkwy

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LTR	L	T	T	R	L	T	TR
Maximum Queue (ft)	30	145	612	16	414	451	405	88	180	159
Average Queue (ft)	4	131	320	1	153	165	39	36	65	39
95th Queue (ft)	21	164	543	7	318	330	182	76	125	92
Link Distance (ft)	299		3511		2073	2073			1041	1041
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		120		125			380	275		
Storage Blk Time (%)		20	53		10	0	0			
Queuing Penalty (veh)		52	116		0	2	0			

TRAFFIC IMPACT STUDY

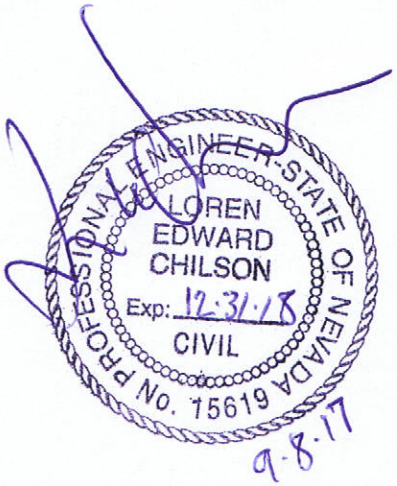
FOR

MIRAMONTE-ANDELIN

September 8, 2017

PREPARED BY:

TRAFFIC WORKS LLC



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YOUR QUESTIONS ANSWERED QUICKLY

Why did you perform this study?

This Traffic Impact Study evaluates the potential traffic impacts associated with construction of the proposed Miramonte-Andelin project which consists of Miramonte Phase 5 (73 lots) and eighteen (18) additional lots in Phase 6.

What does the project consist of?

The proposed project consists of up to 91 single family residential units.

How much traffic will the project generate?

The proposed project is anticipated to generate a total of 866 daily trips, 68 AM peak hour trips, and 91 PM peak hour trips.

Are there any traffic impacts?

All the study intersections are anticipated to operate at acceptable level of service conditions under the "Plus Project" scenario with the left-turn lengthening improvements conditioned at Los Altos (south) / Vista Boulevard with the Miramonte Townhome (Phase 8) project.

The project is estimated to create an additional 866 daily trips of which 520 daily trips will travel south of Belmar Drive to/from Vista Boulevard. Los Altos Parkway from Belmar Drive to Vista Boulevard (existing two-lane facility) is anticipated to operate at LOS "D" in the build-out analysis, with or without the addition of the project traffic. The total Miramonte buildout is not expected to surpass the 2035 RTP threshold triggering a four-lane facility (17,500 ADT) or the 2040 RTP threshold of LOS D equating to 0.90 volume to capacity ratio. Therefore, widening of Los Altos Parkway is not necessary.

The project's contribution of Regional Road Impact Fees will mitigate the minor project effects on the overall roadway network.

Are any traffic related improvements proposed?

No project specific mitigations are proposed with the Miramonte-Andelin project since the analysis showed that the anticipated project traffic does not cause any significant impacts requiring mitigation.

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections and roadway segments associated with construction of the Miramonte-Andelin development. This traffic impact study has been prepared to document existing traffic conditions, quantify traffic volumes generated by the proposed project, identify potential impacts, document findings, and make recommendations to mitigate impacts, if any are found.

Study Area and Evaluated Scenarios

The project site is located generally northeast of Los Altos Parkway, on the extension of Skystone Drive, in Sparks, NV. The studied facilities were identified based on scoping conversations with City of Sparks staff. The project location and the study intersections are shown in **Figure 1** and the site plan is provided in **Figure 2**. The following intersections are included in this study:

- Vista Boulevard (north) / Los Altos Parkway
- Vista Boulevard (south) / Los Altos Parkway
- Los Altos Parkway / Vista Heights Drive (roundabout)
- Los Altos Parkway / Belmar Drive (roundabout)

This study includes analysis of the both the weekday AM and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The study also includes analysis of the AM off-peak hour, between 9:30 AM and 10:30 AM which occurs after the school peak time period. The evaluated development scenarios are:

- Background Conditions
- Background Plus Project Conditions

The following roadway segments were also analyzed in a full build-out scenario:

- Los Altos Parkway (between Belmar Drive and Vista Boulevard)

Analysis Methodology

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades “A” through “F” with “A” representing optimum conditions and “F” representing breakdown or over capacity flows. The complete methodology is established in the Highway Capacity Manual (HCM), 2010, published by the Transportation Research Board.

Signalized and Un-signalized Intersections

Table 1 presents the delay thresholds for each level of service grade at un-signalized and signalized intersections.

Table 1: Level of Service Definition for Intersections

Level of Service	Brief Description	Un-signalized Intersections (average delay/vehicle in seconds)	Signalized Intersections (average delay/vehicle in seconds)
A	Free flow conditions.	< 10	< 10
B	Stable conditions with some affect from other vehicles.	10 to 15	10 to 20
C	Stable conditions with significant affect from other vehicles.	15 to 25	20 to 35
D	High density traffic conditions still with stable flow.	25 to 35	35 to 55
E	At or near capacity flows.	35 to 50	55 to 80
F	Over capacity conditions.	> 50	> 80

Source: Highway Capacity Manual (2010), Chapters 16 and 17

Level of service calculations were performed for the study intersections using the Synchro 9 software suite, with analysis and results reported in accordance with HCM methodology.

Roadway Segments

Table 2 shows the level of service thresholds for roadway segments as established in the Washoe County *2035 Regional Transportation Plan* (2035 RTP) and **Table 3** shows the level of service thresholds from the 2040 RTP. The daily traffic volumes were compared to the thresholds shown in **Table 2** and **Table 3** to determine roadway segment level of service.

Level of Service Policy

The 2040 Regional Transportation Plan (2040 RTP) establishes level of service criteria for regional roadway facilities within Washoe County, the City of Reno, and the City of Sparks. The current Level of Service policy is:

- "All regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon – LOS D or better."
- "All regional roadway facilities projected to carry 27,000 ADT or more at the latest RTP horizon – LOS E or better."
- "All intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting roadways".

According to the Nevada Department of Transportation's 2015 AADT data and recent traffic counts, the average daily volumes on the study roadways are less than 27,000 ADT. Hence, the level of service threshold specific to the study roadways and intersections is LOS "D".

Table 2: Average Daily Traffic LOS Thresholds by Facility Type for Roadway Planning

Facility Type	Maximum Service Flow Rate (daily for given service level)				
Number of Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Freeway					
4	≤ 28,600	42,700	63,500	80,000	90,200
6	≤ 38,300	61,200	91,100	114,000	135,300
8	51,100	81,500	121,400	153,200	180,400
10	63,800	101,900	151,800	191,500	225,500
Arterial-High Access Control					
2	n/a	9,400	17,300	19,200	20,300
4	n/a	20,400	36,100	38,400	40,600
6	n/a	31,600	54,700	57,600	60,900
8	n/a	42,500	73,200	76,800	81,300
Arterial-Moderate Access Control					
2	n/a	5,500	14,800	17,500	18,600
4	n/a	12,000	32,200	35,200	36,900
6	n/a	18,800	49,600	52,900	55,400
8	n/a	25,600	66,800	70,600	73,900
Arterial/Collector-Low Access Control					
2	n/a	n/a	6,900	13,400	15,100
4	n/a	n/a	15,700	28,400	30,200
6	n/a	n/a	24,800	43,100	45,400
8	n/a	n/a	34,000	57,600	60,600
Arterial/Collector-Ultra-Low Access Control					
2	n/a	n/a	6,500	13,300	14,200
4	n/a	n/a	15,300	27,300	28,600
6	n/a	n/a	24,100	41,200	43,000
8	n/a	n/a	33,300	55,200	57,400
Source: Washoe County 2035 RTP Table 3-4.					

Note that the upper volume limit for Level of Service "D" on a two-lane Moderate Access Control Arterial is 17,500 ADT. Above this volume, a four-lane roadway would be needed to achieve policy LOS.

Table 3: Volume to Capacity LOS Thresholds for Roadway Segments

LOS	V/C
A	0.00 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	Greater than 1.00

Note that the volume to capacity threshold for Level of Service "D" on any roadway is 0.90.

EXISTING TRANSPORTATION FACILITIES

Roadway Facilities

A brief description of the key roadways in the study area is provided below.

Vista Boulevard within the study area is a four-lane north-south roadway with two lanes in each direction. It is classified as a "Medium Access Control Arterial" in the 2040 RTP. The posted speed limit is 40 mph in the study area.

Los Altos Parkway is a two-lane roadway with one lane in each direction. It is classified as a "Medium Access Control Arterial" in the 2040 RTP. The posted speed limit is 35 mph.

Belmar Drive is a two-lane roadway that serves as one of the main access roadways to the project. It is classified as a "Low Access Control Collector" in the 2040 RTP.

Vista Heights Drive is a two-lane roadway east of Los Altos Parkway that would serve as a primary entry route to the project. The posted speed limit is 25 mph.

Alternate Travel Modes

There are currently sidewalks along the east side of Los Altos Parkway south of Goodwin Road, the west side of Los Altos Parkway north of Goodwin Road, both sides of Belmar Drive, both sides of Vista Heights Drive, and both sides of Vista Boulevard. Dedicated bike lanes exist in both directions on Los Altos Parkway and Vista Boulevard. The project site will be adequately served with bicycle and pedestrian facilities so long as sidewalk facilities are constructed on new roadways per the applicable Miramonte PUD Handbook and City of Sparks standards.

BACKGROUND CONDITIONS

Background Traffic Volumes

Background intersection traffic volumes were obtained by adding all of the following:

- Existing Traffic Volumes
- Miramonte Townhomes (448 units)
- Vista Village Townhomes (108 units) – pending approval
- 174 approved but unbuilt single family residential units (Locations shown in **Appendix A**)

The existing lane configurations and intersection controls are shown in **Figure 3** and the background intersection traffic volumes are shown on **Figure 4**, attached.

Intersection Level of Service

Level of service calculations were performed using the background traffic volumes, existing lane configurations, and existing traffic controls but with lengthening of the inside left-turn lane on Los Altos Parkway (south) approaching Vista Boulevard as conditioned by the Miramonte Townhomes project. The results are presented in **Table 4** and the calculation sheets are provided in **Appendix B**, attached.

Table 4: Background Conditions Intersection Level of Service Summary

Intersection	Control	AM Peak		AM Off-Peak		PM Peak	
		Delay	LOS	Delay	LOS	Delay	LOS
Los Altos Pkwy/Vista Blvd (south)	Signal	36.5	D	29.6	C	30.2	C
Los Altos Pkwy/Belmar Dr	Roundabout	9.4	A	7.5	A	11.3	B
Los Altos Pkwy/Vista Heights Dr	Roundabout	7.5	A	5.1	A	7.5	A
Los Altos Pkwy/Vista Blvd (north)	Signal	27.8	C	21.6	C	38.5	D

As shown in **Table 4**, all the study intersections are anticipated to operate at acceptable LOS conditions.

PROJECT GENERATED TRAFFIC

Project Description

The project site is located on the extension of Skystone Drive, northeast of Vista Heights Drive. **Figure 2**, attached, shows the lots included in this study. The overall Miramonte Phasing Plan is provided in **Appendix C**. The proposed project consists of 91 single family homes.

Trip Generation

Trip generation rates for the proposed project were obtained from the Trip Generation Manual, 9th Edition, published by the Institute of Transportation Engineers. **Table 5** provides the Daily, AM peak hour and PM peak hour trip generation calculation details for the proposed project.

Table 5: Trip Generation Estimates

ITE Land Use (#)	Size (units)	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Single Family Residential Units (210)	91	866	68	17	51	91	57	34

As shown in **Table 5**, the proposed project is anticipated to generate a total of 866 daily trips, 68 AM peak hour trips, and 91 PM peak hour trips. The ITE trip generation manual does not provide any guidance regarding off-peak trip generation. Hence, as a conservative estimate, the AM off-peak trip generation was assumed to be same as the AM peak hour trip generation. Realistically, the AM off-peak trip generation should be considerably lower than the AM peak hour trip generation.

Project Access

Access to the project site will be provided via Skystone Drive that will connect through Phase 3 of the Miramonte development. Project traffic will then travel southwest to Los Altos Parkway via Vista Heights Drive. Some residents may utilize other internal roadways and Belmar Drive as an alternate route to Los Altos Parkway (south).

Trip Distribution and Assignment

Traffic generated by the project was distributed to the road network based on the location of the project site, major activity centers, the access connection points to arterial roadways, and discussions with City of Sparks staff.

The following trip distribution percentages were used for distributing the project traffic:

- 60% to/from the south via Vista Boulevard
- 10% to/from the north via Vista Boulevard
- 30% to/from the west via Los Altos Parkway

Project generated trips were assigned to the adjacent roadway system based on the distributions outlined above. The project trip assignment is shown on **Figure 5**, attached.

EXISTING PLUS PROJECT CONDITIONS

Traffic Volumes

Plus project traffic volumes were developed by adding the project generated trips (**Figure 5**) to the background traffic volumes (**Figure 4**) and are shown on **Figure 6**, attached. The "Plus Project" condition Peak Hour Factors (PHF) and travel patterns were assumed to remain the same as were observed under existing conditions.

Intersection Level of Service Analysis

Table 6 presents the level of service analysis summary for the "Plus Project" scenario assuming the existing intersection configurations but with lengthening of the inside left-turn lane on Los Altos Parkway (south) approaching Vista Boulevard as conditioned with the Miramonte Townhomes project. Detailed calculation sheets are provided in **Appendix D**, attached.

Table 6: Plus Project Intersection Level of Service Summary

Intersection	Control	AM Peak		AM Off-Peak		PM Peak	
		Delay	LOS	Delay	LOS	Delay	LOS
Los Altos Pkwy/Vista Blvd (south)	Signal	38.1	D	30.4	C	31.1	C
Los Altos Pkwy/Belmar Dr	Roundabout	10.2	B	7.9	A	12.3	B
Los Altos Pkwy/Vista Heights Dr	Roundabout	8.3	A	5.4	A	8.2	A
Los Altos Pkwy/Vista Blvd (north)	Signal	28.6	C	22.1	C	40.6	D

All the study intersections are anticipated to operate at acceptable LOS conditions even with the addition of the project traffic. During all three study periods, the increase in average delay does not exceed 2 seconds per vehicle at any study intersection.

FULL BUILD-OUT ROADWAY ANALYSIS

New existing daily roadway volumes on Los Altos Parkway were collected using pneumatic tube counters on two typical mid-week days in August 2017 with school in session. The counters were placed on Los Altos Pkwy (south) between the Desert Highland Mini Storage and Silver Bear Swim School, as shown on **Figure 1**. The existing ADT on Los Altos Pkwy during the study period was 11,078 vehicles per day. Roadway volume summary reports are attached in **Appendix E**.

However, traffic volumes in the broader study area are anticipated to increase in the future as approved development is completed in The Vistas and Miramonte developments. The full build-out scenario includes the following:

- Existing daily roadway volumes
- All approved but unbuilt lots within The Vistas and Miramonte developments (174 single family homes)
- Miramonte Phases 5-7 (372 single family homes)
- Miramonte Phase 8 (448 Townhomes)
- Sierra View Townhomes (Approximately 45 Townhomes)
- Vista Village (up to 108 townhomes) – pending approval

In total there are 546 single family homes (including the project) and potentially 601 townhomes that are planned to be constructed within the study area. Traffic from the future developments will follow the same distribution as previously described in this report; 60% of vehicle trips will travel on Los Altos Parkway (south). **Table 7** shows the added daily trip generation of the un-built units that will travel on Los Altos Pkwy (south) to/from Vista Boulevard.

Table 7: Future Additional Daily Trip Generation on Los Altos Parkway (south)

Development	# of units	ADT
Approved but Unbuilt Single Family Units	174	994
Miramonte Single Family Homes (Phases 5-7)	372	2,125
Miramonte Townhomes (Phase 8)	448	1,562
Vista Village Townhomes	108	376
Sierra View Townhomes	45	158
Total	**1,147**	**5,215**

As shown in **Table 7**, the approved and anticipated units within the study area will create approximately 5,215 additional trips on Los Altos Parkway between Belmar Drive and Vista Boulevard. With the exception of what is noted above, very little additional traffic volume growth is anticipated to occur on Los Altos Parkway. Hence, no additional growth rates were applied for the full build-out roadway segment analysis as discussed and agreed with City of Sparks staff.

The build-out roadway traffic volumes were obtained by adding the future traffic generated by units in The Vistas and Miramonte developments (5,215 daily trips) as shown in **Table 7** to the recently counted existing roadway volumes (11,078 daily trips).

Table 8 summarizes the full build-out roadway segment level of service analysis.

Table 8: Full Build-out Road Segment Level of Service Summary

Type	Segment	# Lanes	Daily Volume	LOS
MAC	Los Altos Parkway (Belmar Dr to Vista Blvd)	2	16,293	D

As shown in **Table 8**, Los Altos Parkway between Belmar Drive and Vista Boulevard is anticipated to operate at acceptable LOS conditions (LOS "D") in the full build-out analysis. The buildout volume is less than the threshold volume (17,500 ADT) that would require widening to a four-lane facility. Additionally, the full build-out roadway peak hour volume will approximately be 1,129 vehicles per hour and the capacity of the roadway is 1,705 vehicles per hour. Thus, the volume to capacity ratio will be 0.66 (LOS "B") under the full build-out scenario.

CONCLUSIONS & RECOMMENDATIONS

The following is a list of our key findings and recommendations:

Project Trips: The proposed project is anticipated to generate a total of 866 daily trips, 68 AM peak hour trips, and 91 PM peak hour trips. The ITE trip generation manual does not provide any guidance regarding off-peak trip generation. Hence, as a conservative estimate, the AM off-peak trip generation was assumed to be the same as the trip generation during the AM peak hour.

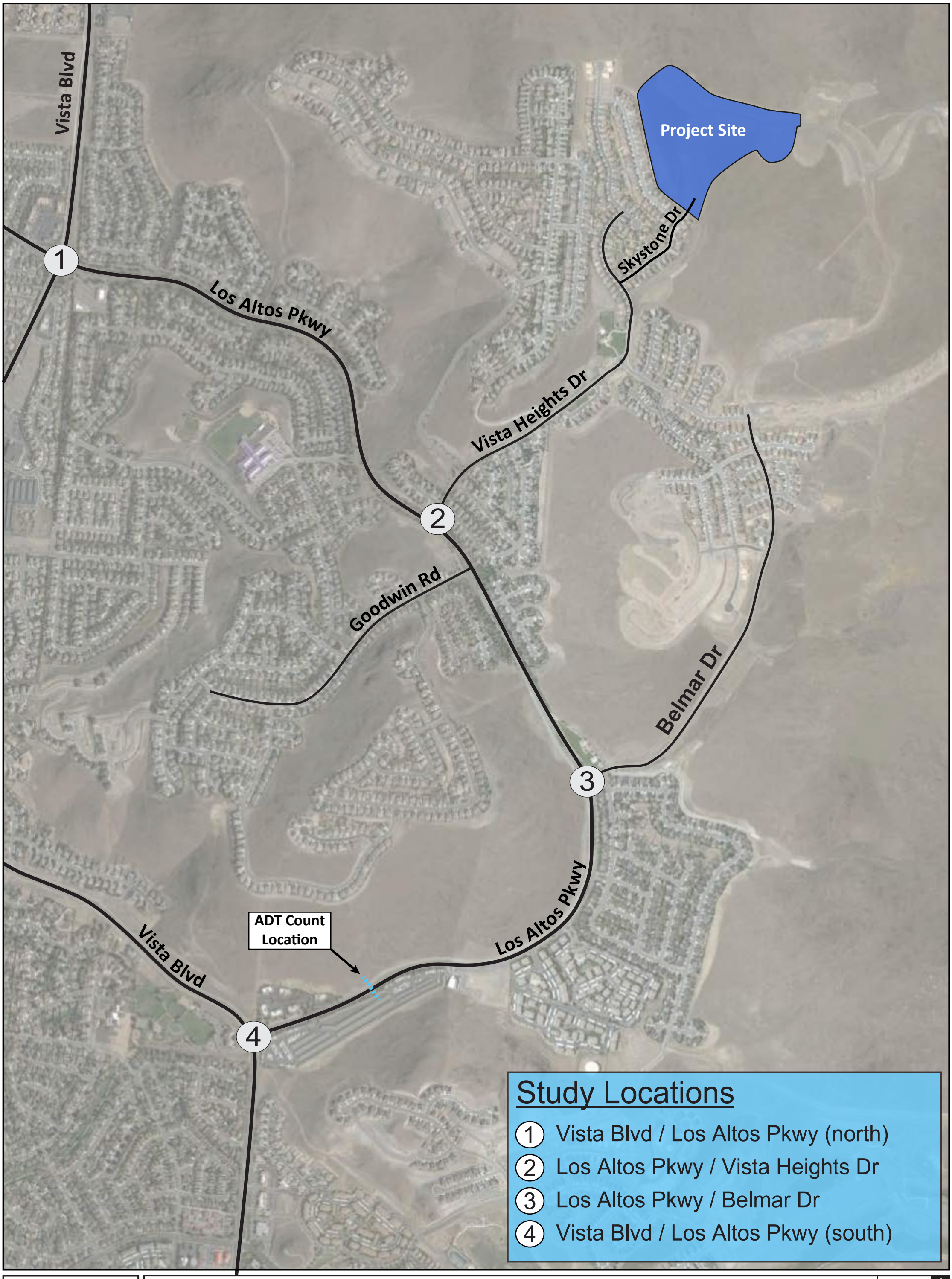
Project Access: Access to the project site will be provided via Skystone Drive that will connect through Phase 3 of the Miramonte development area. Some residents can be expected to use other internal roadways and Belmar Drive to/from Los Altos Parkway (south).

Background Level of Service: All the study intersections operate at acceptable levels of service during both the AM and PM peak hours, and the AM off-peak hour.

Plus Project Level of Service: With the addition of the project traffic, all the study intersections are anticipated to operate at acceptable Level of Service (LOS) conditions during the AM and PM peak hours, and the AM off-peak hour. No notable impacts were identified.

Build-out Roadway Level of Service: Los Altos Parkway between Belmar Drive and Vista Boulevard is anticipated to operate at LOS "D" or better under build-out conditions with two travel lanes. The build-out volume is below the 2035 RTP threshold value for widening to four lanes and meets acceptable volume to capacity ratio standards (LOS "B") as required by the 2040 RTP. The roadway segment LOS is anticipated to be the same with or without the Miramonte-Andelin project.

Regional Road Impact Fees: The project's contribution of standard Regional Road Impact Fees will mitigate the minor project effects on the overall roadway network.

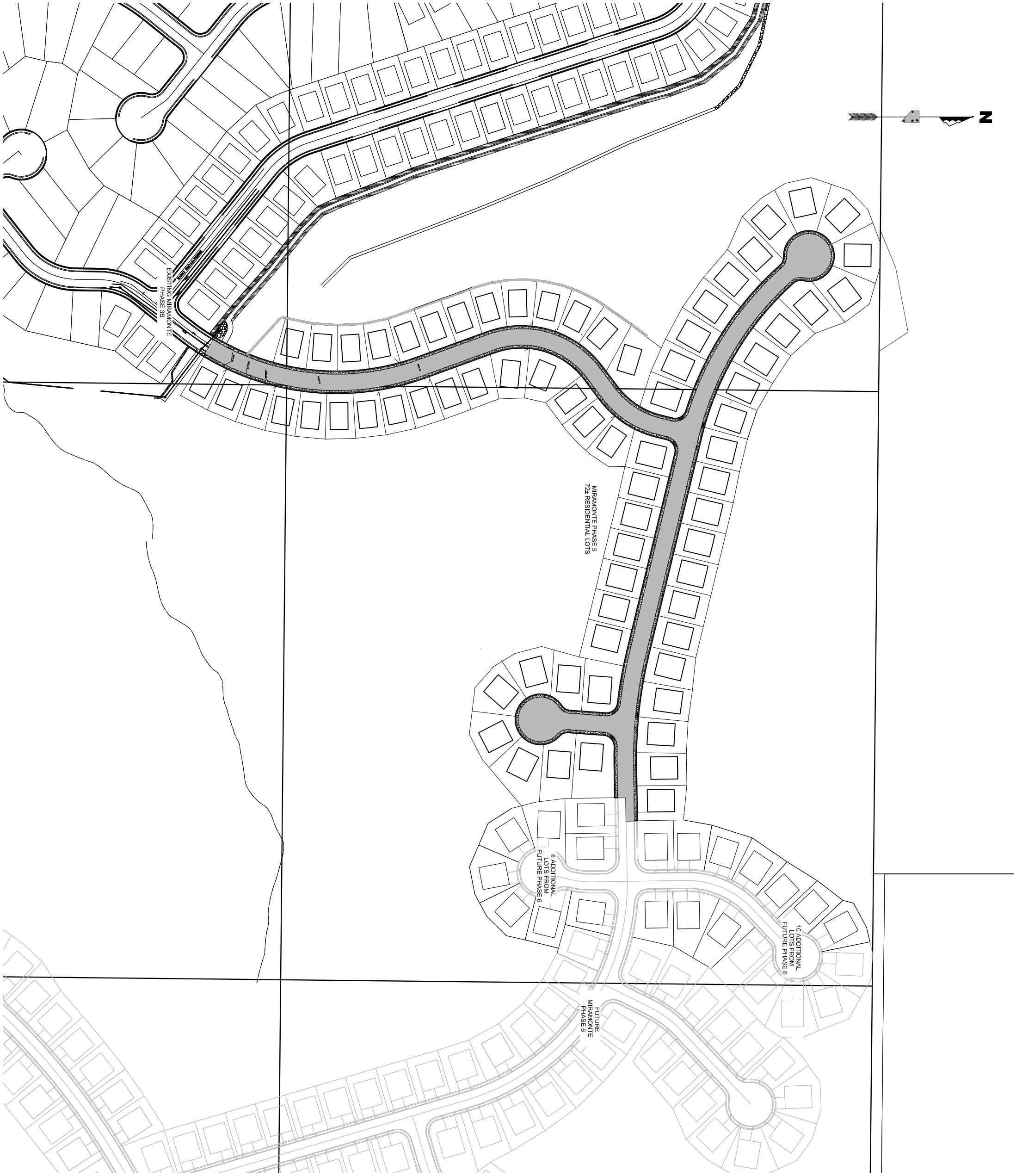


TRAFFIC WORKS LLC

NO SCALE

Figure 1

Miramonte-Andelin
TRAFFIC IMPACT STUDY
Study Area



TRAFFIC WORKS LLC

NO SCALE

Figure 2

Miramonte-Andelin

TRAFFIC IMPACT STUDY

Site Plan

Project Site

Vista Blvd

Skystone Dr

Los Altos Pkwy

Vista Heights Dr

Goodwin Rd

Belmar Dr

Vista Blvd

Los Altos Pkwy

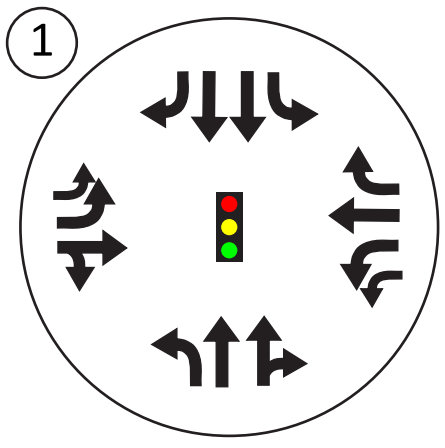
1

2

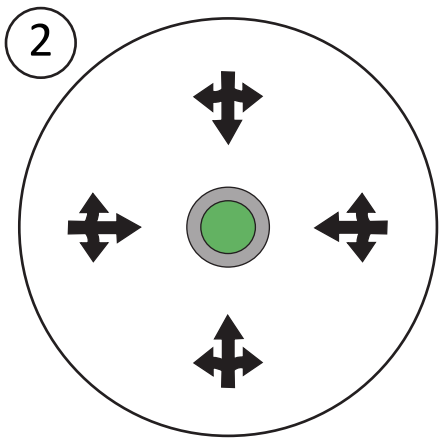
3

4

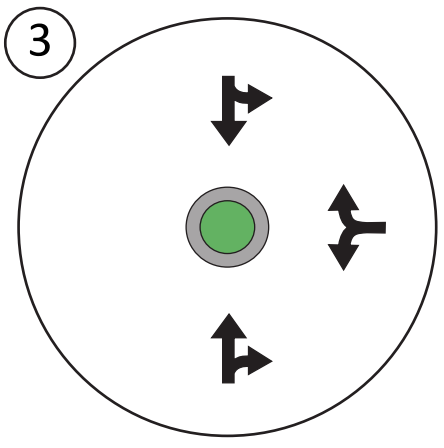
Vista Blvd / Los Altos Pkwy (north)



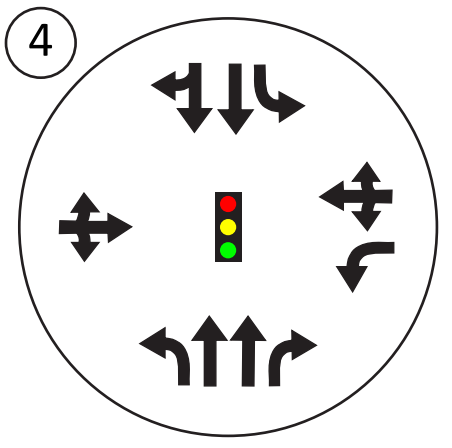
Los Altos Pkwy / Vista Heights Dr



Los Altos Pkwy / Belmar Dr



Vista Blvd / Los Altos Pkwy (south)



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NO SCALE

Figure 3

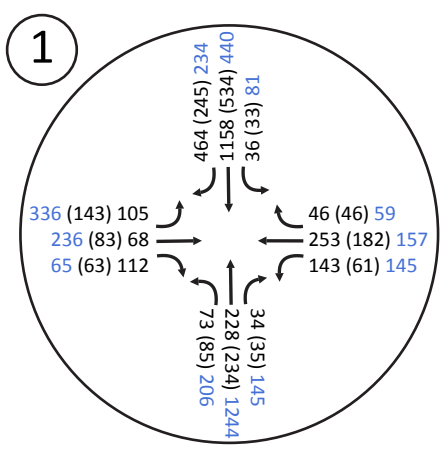
Miramonte-Andelin

TRAFFIC IMPACT STUDY

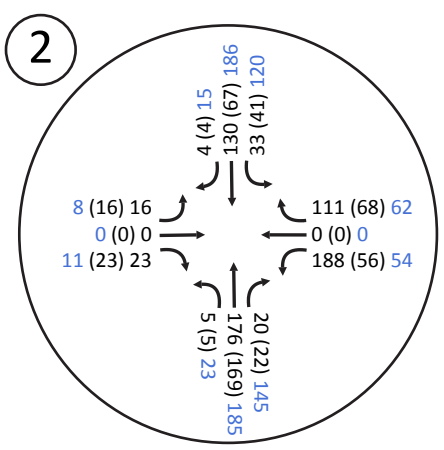
Lane Configurations and Controls

Project Site
Vista Blvd
Skystone Dr
Los Altos Pkwy
Vista Heights Dr
Goodwin Rd
Belmar Dr
Vista Blvd
Los Altos Pkwy
1
2
3
4

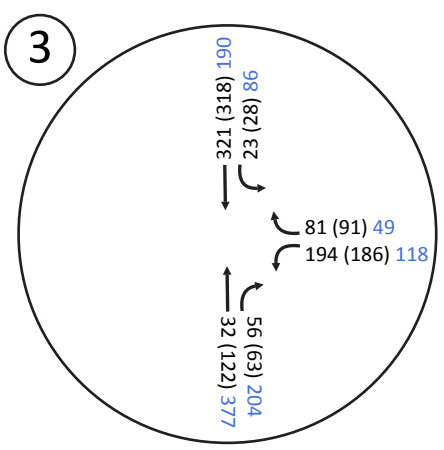
Vista Blvd / Los Altos Pkwy (north)



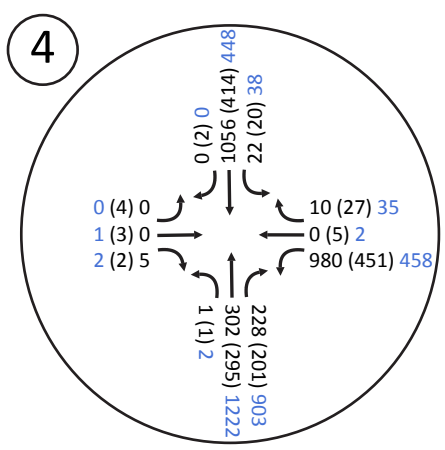
Los Altos Pkwy / Vista Heights Dr



Los Altos Pkwy / Belmar Dr



Vista Blvd / Los Altos Pkwy (south)



AM Peak Hour Volume (Post-AM Peak Hour Volume) PM Peak Hour

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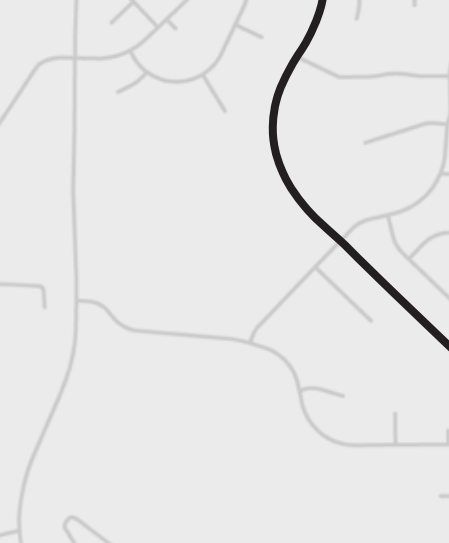
NO SCALE

Figure 4
Miramonte-Andelin
TRAFFIC IMPACT STUDY
Background Traffic Volumes

Project Site
Vista Blvd
Skystone Dr
Los Altos Pkwy
Vista Heights Dr
Goodwin Rd
Belmar Dr
Los Altos Pkwy
Vista Blvd
1
2
3
4

Vista Blvd / Los Altos Pkwy (north)



Los Altos Pkwy / Vista Heights Dr

Los Altos Pkwy / Belmar Dr

Vista Blvd / Los Altos Pkwy (south)

AM Peak Hour Volume (Post-AM Peak Hour Volume) PM Peak Hour

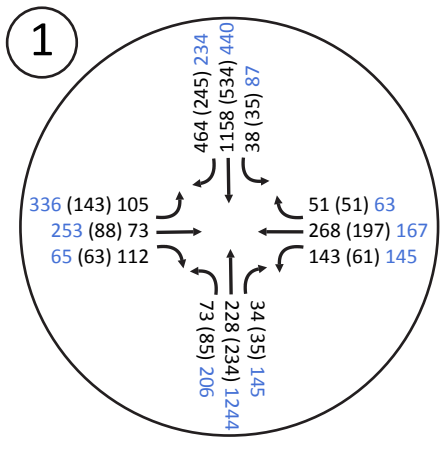
TRAFFIC WORKS LLC

NO SCALE

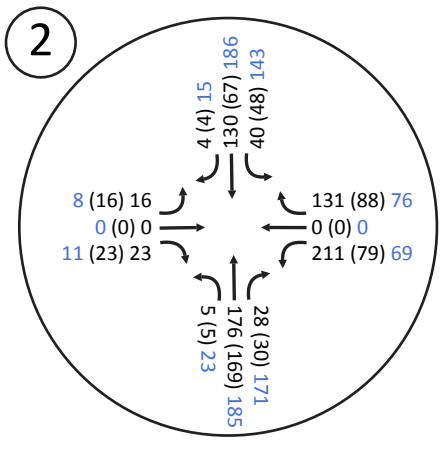
Figure 5
Miramonte-Andelin
TRAFFIC IMPACT STUDY
Project Trips

Project Site
Vista Blvd
Skystone Dr
Los Altos Pkwy
Vista Heights Dr
Goodwin Rd
Belmar Dr
Vista Blvd
Los Altos Pkwy
1
2
3
4

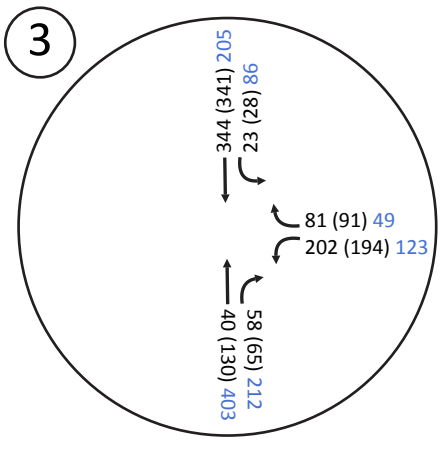
Vista Blvd / Los Altos Pkwy (north)



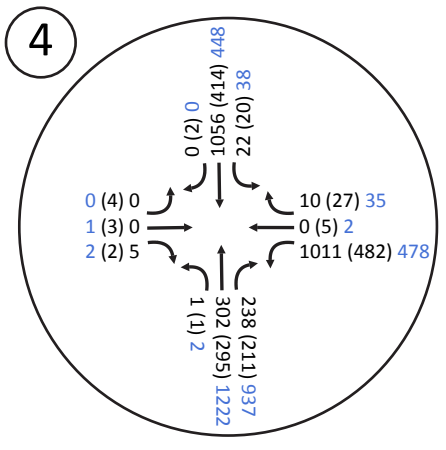
Los Altos Pkwy / Vista Heights Dr



Los Altos Pkwy / Belmar Dr



Vista Blvd / Los Altos Pkwy (south)



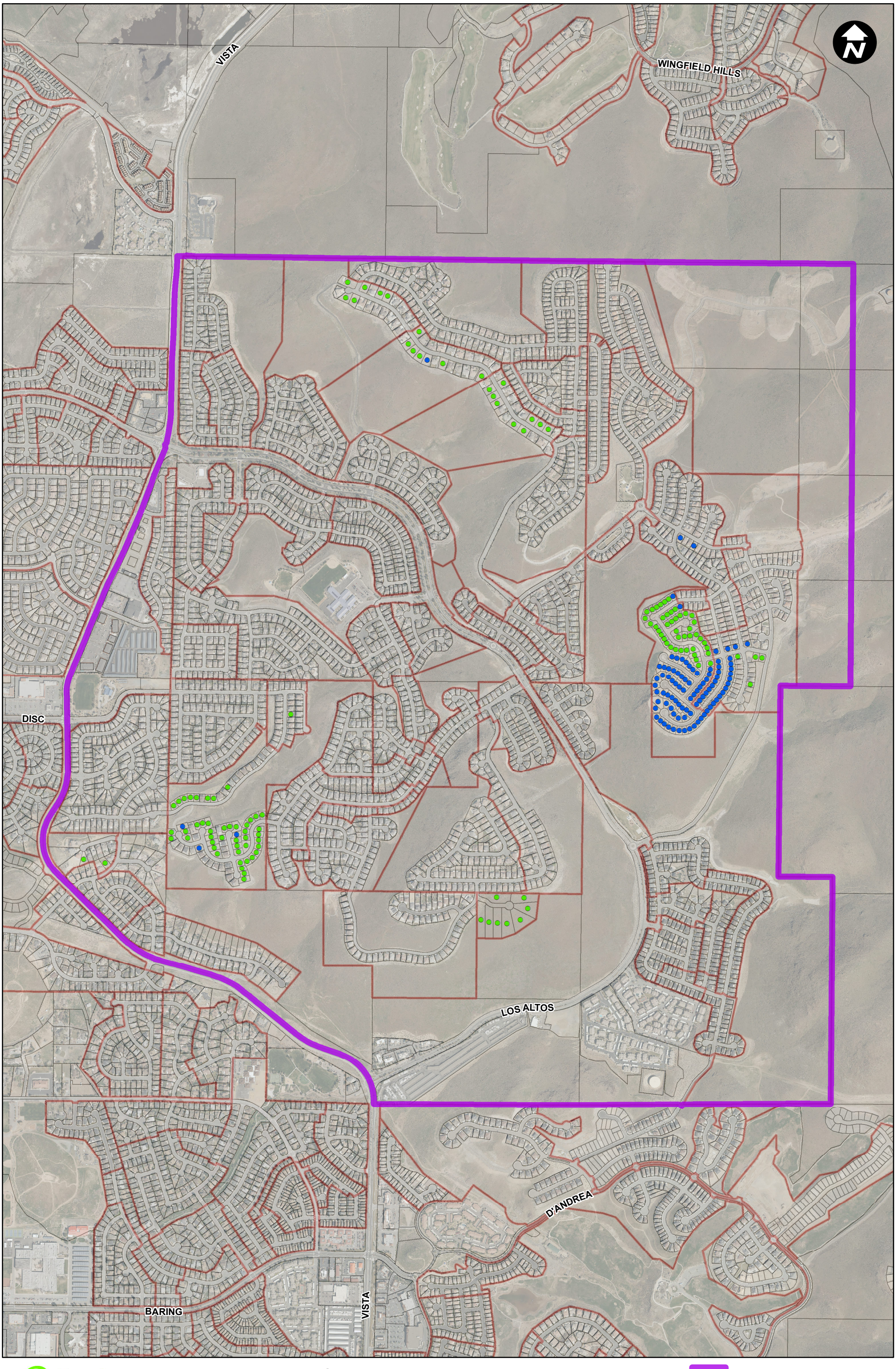
AM Peak Hour Volume (Post-AM Peak Hour Volume) PM Peak Hour

TRAFFIC WORKS LLC

NO SCALE

Figure 6
Miramonte-Andelin
TRAFFIC IMPACT STUDY
Background Plus Project Traffic Volumes

Appendix A
Locations of Approved but Unbuilt Lots



Miramonte Full Build Out Analysis

Parcel Status

- Available (124)
- Permitted (95)

Miramonte Full Buildout Extent

Subdivison

\\GISONE\GISData\Projects\JEricson\MiramonteFullBuildoutAnalysis_201708\MiramonteFullBuildoutAnalysis_20170810_0922.mxd

Appendix B

Background Plus
Project LOS Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	980	0	10	1	302	228	22	1056	0
Future Volume (vph)	0	0	5	980	0	10	1	302	228	22	1056	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1627		1698	1698		1787	3574	1599	1787	3574	
Flt Permitted		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1627		1698	1698		1787	3574	1599	1787	3574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	5	1065	0	11	1	328	248	24	1148	0
RTOR Reduction (vph)	0	5	0	0	69	0	0	0	158	0	0	0
Lane Group Flow (vph)	0	0	0	543	464	0	1	328	90	24	1148	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		0.9		54.2	54.2		1.0	47.2	47.2	4.4	50.6	
Effective Green, g (s)		0.9		54.2	54.2		1.0	47.2	47.2	4.4	50.6	
Actuated g/C Ratio		0.01		0.42	0.42		0.01	0.36	0.36	0.03	0.39	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		11		707	707		13	1297	580	60	1391	
v/s Ratio Prot		c0.00		c0.32	0.27		0.00	0.09		c0.01	c0.32	
v/s Ratio Perm									0.06			
v/c Ratio		0.00		0.77	0.66		0.08	0.25	0.16	0.40	0.83	
Uniform Delay, d1		64.1		32.5	30.4		64.0	29.0	27.9	61.5	35.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		4.5	1.7		0.9	0.5	0.6	1.6	5.7	
Delay (s)		64.1		37.0	32.1		65.0	29.5	28.5	63.1	41.4	
Level of Service		E		D	C		E	C	C	E	D	
Approach Delay (s)		64.1			34.6			29.1			41.9	
Approach LOS		E			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

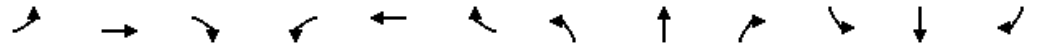
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	387	124	484
Demand Flow Rate, veh/h	391	125	489
Vehicles Circulating, veh/h	45	32	276
Vehicles Exiting, veh/h	112	733	160
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.1	4.3	12.6
Approach LOS	A	A	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	391	125	489
Cap Entry Lane, veh/h	1080	1094	857
Entry HV Adj Factor	0.990	0.988	0.991
Flow Entry, veh/h	387	124	484
Cap Entry, veh/h	1069	1082	849
V/C Ratio	0.362	0.114	0.570
Control Delay, s/veh	7.1	4.3	12.6
LOS	A	A	B
95th %tile Queue, veh	2	0	4

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	42	379	253	211
Demand Flow Rate, veh/h	42	382	255	213
Vehicles Circulating, veh/h	449	247	59	245
Vehicles Exiting, veh/h	9	67	432	384
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.6	9.4	5.7	6.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	42	382	255	213
Cap Entry Lane, veh/h	721	883	1065	884
Entry HV Adj Factor	1.000	0.992	0.991	0.992
Flow Entry, veh/h	42	379	253	211
Cap Entry, veh/h	721	876	1056	878
V/C Ratio	0.058	0.433	0.239	0.241
Control Delay, s/veh	5.6	9.4	5.7	6.6
LOS	A	A	A	A
95th %tile Queue, veh	0	2	1	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	68	112	143	253	46	73	228	34	36	1158	464
Future Volume (vph)	105	68	112	143	253	46	73	228	34	36	1158	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1706		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1706		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	76	124	159	281	51	81	253	38	40	1287	516
RTOR Reduction (vph)	0	55	0	0	0	41	0	8	0	0	0	212
Lane Group Flow (vph)	117	145	0	159	281	10	81	283	0	40	1287	304
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.9	18.3		9.3	20.7	20.7	7.4	57.5		3.6	53.7	53.7
Effective Green, g (s)	6.9	18.3		9.3	20.7	20.7	7.4	57.5		3.6	53.7	53.7
Actuated g/C Ratio	0.07	0.17		0.09	0.20	0.20	0.07	0.55		0.03	0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	228	298		307	371	316	126	1924		61	1833	820
v/s Ratio Prot	0.03	0.08		c0.05	c0.15		c0.05	c0.08		0.02	c0.36	
v/s Ratio Perm						0.01						0.19
v/c Ratio	0.51	0.49		0.52	0.76	0.03	0.64	0.15		0.66	0.70	0.37
Uniform Delay, d1	47.3	39.0		45.6	39.6	33.9	47.4	11.6		49.9	19.4	15.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	1.2		1.5	8.6	0.0	10.7	0.2		22.6	2.3	1.3
Delay (s)	49.2	40.2		47.0	48.2	34.0	58.1	11.7		72.5	21.7	16.6
Level of Service	D	D		D	D	C	E	B		E	C	B
Approach Delay (s)		43.5			46.3			21.8			21.4	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	104.7	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	67.0%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	3	2	451	5	27	1	295	201	20	414	2
Future Volume (vph)	4	3	2	451	5	27	1	295	201	20	414	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785		1698	1684		1072	2859	1583	1787	3572	
Flt Permitted		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1785		1698	1684		1072	2859	1583	1787	3572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	3	2	490	5	29	1	321	218	22	450	2
RTOR Reduction (vph)	0	2	0	0	5	0	0	0	91	0	0	0
Lane Group Flow (vph)	0	7	0	265	254	0	1	321	127	22	452	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.3		25.6	25.6		1.1	75.5	75.5	4.3	78.7	
Effective Green, g (s)		1.3		25.6	25.6		1.1	75.5	75.5	4.3	78.7	
Actuated g/C Ratio		0.01		0.20	0.20		0.01	0.58	0.58	0.03	0.61	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		17		334	331		9	1660	919	59	2162	
v/s Ratio Prot		c0.00		c0.16	0.15		0.00	0.11		c0.01	c0.13	
v/s Ratio Perm									0.08			
v/c Ratio		0.41		0.79	0.77		0.11	0.19	0.14	0.37	0.21	
Uniform Delay, d1		64.0		49.7	49.4		64.0	12.9	12.4	61.5	11.6	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.8		11.4	9.3		2.0	0.3	0.3	1.4	0.2	
Delay (s)		69.8		61.1	58.6		66.0	13.1	12.7	63.0	11.8	
Level of Service		E		E	E		E	B	B	E	B	
Approach Delay (s)		69.8			59.9			13.1			14.2	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	314	211	393
Demand Flow Rate, veh/h	317	213	397
Vehicles Circulating, veh/h	140	32	213
Vehicles Exiting, veh/h	105	578	244
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	7.1	5.1	9.2
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	317	213	397
Cap Entry Lane, veh/h	982	1094	913
Entry HV Adj Factor	0.991	0.989	0.991
Flow Entry, veh/h	314	211	393
Cap Entry, veh/h	972	1082	905
V/C Ratio	0.323	0.195	0.435
Control Delay, s/veh	7.1	5.1	9.2
LOS	A	A	A
95th %tile Queue, veh	1	1	2

Intersection	
Intersection Delay, s/veh	5.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	42	138	217	124
Demand Flow Rate, veh/h	42	140	219	125
Vehicles Circulating, veh/h	184	212	63	68
Vehicles Exiting, veh/h	9	70	163	284
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.2	5.5	5.3	4.5
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	42	140	219	125
Cap Entry Lane, veh/h	940	914	1061	1056
Entry HV Adj Factor	1.000	0.986	0.991	0.994
Flow Entry, veh/h	42	138	217	124
Cap Entry, veh/h	940	901	1052	1049
V/C Ratio	0.045	0.153	0.206	0.118
Control Delay, s/veh	4.2	5.5	5.3	4.5
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	83	63	61	182	46	85	234	35	33	534	245
Future Volume (vph)	143	83	63	61	182	46	85	234	35	33	534	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1759		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1759		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	154	89	68	66	196	49	91	252	38	35	574	263
RTOR Reduction (vph)	0	34	0	0	0	40	0	10	0	0	0	152
Lane Group Flow (vph)	154	123	0	66	196	9	91	280	0	35	574	111
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.7	17.3		4.4	14.0	14.0	7.1	36.3		3.5	32.7	32.7
Effective Green, g (s)	7.7	17.3		4.4	14.0	14.0	7.1	36.3		3.5	32.7	32.7
Actuated g/C Ratio	0.10	0.22		0.06	0.18	0.18	0.09	0.47		0.05	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	344	392		196	339	288	163	1641		80	1507	674
v/s Ratio Prot	c0.04	c0.07		0.02	c0.10		c0.05	c0.08		0.02	c0.16	
v/s Ratio Perm						0.01						0.07
v/c Ratio	0.45	0.31		0.34	0.58	0.03	0.56	0.17		0.44	0.38	0.16
Uniform Delay, d1	32.9	25.1		35.1	29.0	26.2	33.7	11.9		36.0	15.4	13.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.5		1.0	2.4	0.0	4.1	0.2		3.8	0.7	0.5
Delay (s)	33.8	25.6		36.2	31.4	26.2	37.8	12.1		39.8	16.2	14.4
Level of Service	C	C		D	C	C	D	B		D	B	B
Approach Delay (s)		29.7			31.6			18.3			16.6	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	2	458	2	35	2	1222	903	38	448	0
Future Volume (vph)	0	1	2	458	2	35	2	1222	903	38	448	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.91		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1712		1698	1678		1072	2859	1583	1787	3574	
Flt Permitted		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1712		1698	1678		1072	2859	1583	1787	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	2	482	2	37	2	1286	951	40	472	0
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	371	0	0	0
Lane Group Flow (vph)	0	1	0	260	257	0	2	1286	580	40	472	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.1		27.2	27.2		1.2	91.5	91.5	6.9	97.2	
Effective Green, g (s)		1.1		27.2	27.2		1.2	91.5	91.5	6.9	97.2	
Actuated g/C Ratio		0.01		0.18	0.18		0.01	0.61	0.61	0.05	0.65	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		12		307	304		8	1743	965	82	2315	
v/s Ratio Prot		c0.00		c0.15	0.15		0.00	c0.45		c0.02	0.13	
v/s Ratio Perm									0.37			
v/c Ratio		0.08		0.85	0.85		0.25	0.74	0.60	0.49	0.20	
Uniform Delay, d1		73.9		59.4	59.4		74.0	20.7	18.0	69.8	10.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1		18.3	18.2		5.9	2.8	2.8	1.7	0.2	
Delay (s)		75.1		77.6	77.6		79.8	23.6	20.8	71.5	10.9	
Level of Service		E		E	E		E	C	C	E	B	
Approach Delay (s)		75.1			77.6			22.4			15.6	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	197	684	325
Demand Flow Rate, veh/h	199	690	328
Vehicles Circulating, veh/h	448	102	140
Vehicles Exiting, veh/h	344	366	507
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	8.3	14.0	7.2
Approach LOS	A	B	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	199	690	328
Cap Entry Lane, veh/h	722	1020	982
Entry HV Adj Factor	0.990	0.991	0.990
Flow Entry, veh/h	197	684	325
Cap Entry, veh/h	714	1011	973
V/C Ratio	0.276	0.676	0.334
Control Delay, s/veh	8.3	14.0	7.2
LOS	A	B	A
95th %tile Queue, veh	1	6	1

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	21	133	405	368
Demand Flow Rate, veh/h	21	135	409	371
Vehicles Circulating, veh/h	418	249	148	88
Vehicles Exiting, veh/h	41	308	291	296
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	5.7	8.5	7.2
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	21	135	409	371
Cap Entry Lane, veh/h	744	881	974	1035
Entry HV Adj Factor	1.000	0.985	0.990	0.992
Flow Entry, veh/h	21	133	405	368
Cap Entry, veh/h	744	868	965	1026
V/C Ratio	0.028	0.153	0.420	0.359
Control Delay, s/veh	5.1	5.7	8.5	7.2
LOS	A	A	A	A
95th %tile Queue, veh	0	1	2	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	236	65	145	157	59	206	1244	145	81	440	234
Future Volume (vph)	336	236	65	145	157	59	206	1244	145	81	440	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1820		3467	1881	1599	1787	3518		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1820		3467	1881	1599	1787	3518		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	361	254	70	156	169	63	222	1338	156	87	473	252
RTOR Reduction (vph)	0	9	0	0	0	51	0	7	0	0	0	158
Lane Group Flow (vph)	361	315	0	156	169	12	222	1487	0	87	473	94
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.1	23.1		9.2	19.2	19.2	17.4	51.2		5.0	38.8	38.8
Effective Green, g (s)	13.1	23.1		9.2	19.2	19.2	17.4	51.2		5.0	38.8	38.8
Actuated g/C Ratio	0.13	0.22		0.09	0.18	0.18	0.17	0.49		0.05	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	434	402		305	345	293	297	1723		85	1326	593
v/s Ratio Prot	c0.10	c0.17		0.04	0.09		0.12	c0.42		c0.05	0.13	
v/s Ratio Perm						0.01						0.06
v/c Ratio	0.83	0.78		0.51	0.49	0.04	0.75	0.86		1.02	0.36	0.16
Uniform Delay, d1	44.6	38.3		45.5	38.3	35.1	41.5	23.6		49.8	23.8	21.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.8	9.6		1.4	1.1	0.1	9.8	6.0		104.2	0.8	0.6
Delay (s)	57.4	47.9		47.0	39.4	35.1	51.3	29.6		153.9	24.6	22.5
Level of Service	E	D		D	D	D	D	C		F	C	C
Approach Delay (s)		52.9			41.7			32.4			37.8	
Approach LOS		D			D			C			D	

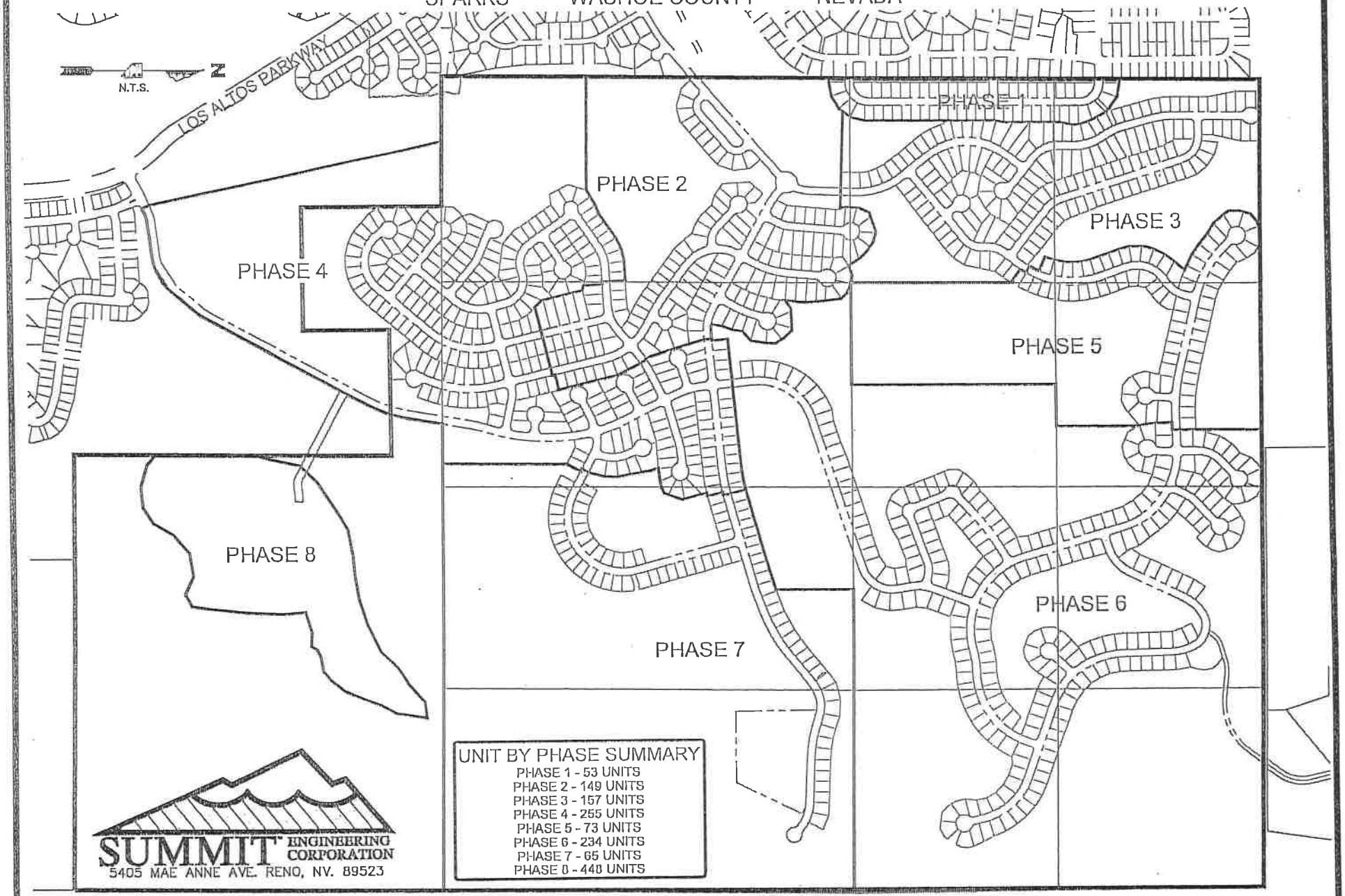
Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix C
Miramonte Phasing Plan

PHASIN EXHIBIT
MIRAMONTE

SPARKS WASHOE COUNTY NEVADA



UNIT BY PHASE SUMMARY

PHASE 1 - 53 UNITS
PHASE 2 - 149 UNITS
PHASE 3 - 157 UNITS
PHASE 4 - 255 UNITS
PHASE 5 - 73 UNITS
PHASE 6 - 234 UNITS
PHASE 7 - 65 UNITS
PHASE 8 - 448 UNITS

SUMMIT ENGINEERING CORPORATION
5405 MAE ANNE AVE. RENO, NV. 89523

Appendix D
Plus Project Conditions LOS Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	1011	0	10	1	302	238	22	1056	0
Future Volume (vph)	0	0	5	1011	0	10	1	302	238	22	1056	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1627		1698	1699		1787	3574	1599	1787	3574	
Flt Permitted		1.00		0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1627		1698	1699		1787	3574	1599	1787	3574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	5	1099	0	11	1	328	259	24	1148	0
RTOR Reduction (vph)	0	5	0	0	66	0	0	0	171	0	0	0
Lane Group Flow (vph)	0	0	0	560	484	0	1	328	88	24	1148	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		0.9		57.0	57.0		1.0	44.4	44.4	4.4	47.8	
Effective Green, g (s)		0.9		57.0	57.0		1.0	44.4	44.4	4.4	47.8	
Actuated g/C Ratio		0.01		0.44	0.44		0.01	0.34	0.34	0.03	0.37	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		11		744	744		13	1220	546	60	1314	
v/s Ratio Prot		c0.00		c0.33	0.28		0.00	0.09		c0.01	c0.32	
v/s Ratio Perm									0.06			
v/c Ratio		0.00		0.75	0.65		0.08	0.27	0.16	0.40	0.87	
Uniform Delay, d1		64.1		30.6	28.7		64.0	31.0	29.8	61.5	38.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		3.8	1.6		0.9	0.5	0.6	1.6	8.3	
Delay (s)		64.1		34.4	30.2		65.0	31.6	30.5	63.1	46.6	
Level of Service		E		C	C		E	C	C	E	D	
Approach Delay (s)		64.1			32.4			31.1			46.9	
Approach LOS		E			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	399	152	517
Demand Flow Rate, veh/h	403	154	522
Vehicles Circulating, veh/h	57	32	288
Vehicles Exiting, veh/h	129	778	172
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.3	4.6	14.0
Approach LOS	A	A	B

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	403	154	522
Cap Entry Lane, veh/h	1067	1094	847
Entry HV Adj Factor	0.990	0.990	0.991
Flow Entry, veh/h	399	152	517
Cap Entry, veh/h	1057	1083	839
V/C Ratio	0.378	0.141	0.616
Control Delay, s/veh	7.3	4.6	14.0
LOS	A	A	B
95th %tile Queue, veh	2	0	4

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	42	433	263	220
Demand Flow Rate, veh/h	42	438	265	223
Vehicles Circulating, veh/h	489	247	69	275
Vehicles Exiting, veh/h	9	87	462	410
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	10.6	5.9	7.0
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	42	438	265	223
Cap Entry Lane, veh/h	693	883	1055	858
Entry HV Adj Factor	1.000	0.989	0.992	0.988
Flow Entry, veh/h	42	433	263	220
Cap Entry, veh/h	693	873	1046	848
V/C Ratio	0.061	0.496	0.251	0.260
Control Delay, s/veh	5.8	10.6	5.9	7.0
LOS	A	B	A	A
95th %tile Queue, veh	0	3	1	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	73	112	143	268	51	73	228	34	38	1158	464
Future Volume (vph)	105	73	112	143	268	51	73	228	34	38	1158	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1711		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1711		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	81	124	159	298	57	81	253	38	42	1287	516
RTOR Reduction (vph)	0	51	0	0	0	45	0	8	0	0	0	206
Lane Group Flow (vph)	117	154	0	159	298	12	81	283	0	42	1287	310
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.9	19.3		9.3	21.7	21.7	7.4	57.5		3.6	53.7	53.7
Effective Green, g (s)	6.9	19.3		9.3	21.7	21.7	7.4	57.5		3.6	53.7	53.7
Actuated g/C Ratio	0.07	0.18		0.09	0.21	0.21	0.07	0.54		0.03	0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	226	312		305	386	328	125	1906		60	1815	812
v/s Ratio Prot	0.03	0.09		c0.05	c0.16		c0.05	c0.08		0.02	c0.36	
v/s Ratio Perm						0.01						0.19
v/c Ratio	0.52	0.49		0.52	0.77	0.04	0.65	0.15		0.70	0.71	0.38
Uniform Delay, d1	47.8	38.8		46.1	39.7	33.6	47.9	12.0		50.5	20.0	15.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	1.2		1.6	9.2	0.0	11.0	0.2		30.0	2.4	1.4
Delay (s)	49.8	40.0		47.7	48.9	33.7	58.9	12.1		80.5	22.4	17.2
Level of Service	D	D		D	D	C	E	B		F	C	B
Approach Delay (s)		43.6			46.8			22.3			22.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	3	2	482	5	27	1	295	211	20	414	2
Future Volume (vph)	4	3	2	482	5	27	1	295	211	20	414	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785		1698	1685		1072	2859	1583	1787	3572	
Flt Permitted		0.98		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1785		1698	1685		1072	2859	1583	1787	3572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	3	2	524	5	29	1	321	229	22	450	2
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	98	0	0	0
Lane Group Flow (vph)	0	7	0	283	271	0	1	321	131	22	452	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.3		27.0	27.0		1.1	74.1	74.1	4.3	77.3	
Effective Green, g (s)		1.3		27.0	27.0		1.1	74.1	74.1	4.3	77.3	
Actuated g/C Ratio		0.01		0.21	0.21		0.01	0.57	0.57	0.03	0.59	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		17		352	349		9	1629	902	59	2123	
v/s Ratio Prot		c0.00		c0.17	0.16		0.00	0.11		c0.01	c0.13	
v/s Ratio Perm									0.08			
v/c Ratio		0.41		0.80	0.78		0.11	0.20	0.14	0.37	0.21	
Uniform Delay, d1		64.0		49.0	48.7		64.0	13.5	13.1	61.5	12.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.8		11.8	9.5		2.0	0.3	0.3	1.4	0.2	
Delay (s)		69.8		60.8	58.2		66.0	13.8	13.4	63.0	12.5	
Level of Service		E		E	E		E	B	B	E	B	
Approach Delay (s)		69.8			59.5			13.7			14.8	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	323	222	420
Demand Flow Rate, veh/h	326	224	424
Vehicles Circulating, veh/h	149	32	222
Vehicles Exiting, veh/h	107	614	253
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	7.3	5.2	9.8
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	326	224	424
Cap Entry Lane, veh/h	974	1094	905
Entry HV Adj Factor	0.991	0.989	0.991
Flow Entry, veh/h	323	222	420
Cap Entry, veh/h	964	1082	897
V/C Ratio	0.335	0.205	0.469
Control Delay, s/veh	7.3	5.2	9.8
LOS	A	A	A
95th %tile Queue, veh	1	1	3

Intersection	
Intersection Delay, s/veh	5.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	42	186	226	131
Demand Flow Rate, veh/h	42	188	228	133
Vehicles Circulating, veh/h	218	212	71	94
Vehicles Exiting, veh/h	9	87	189	306
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.4	6.0	5.5	4.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	42	188	228	133
Cap Entry Lane, veh/h	909	914	1052	1029
Entry HV Adj Factor	1.000	0.989	0.992	0.987
Flow Entry, veh/h	42	186	226	131
Cap Entry, veh/h	909	904	1044	1015
V/C Ratio	0.046	0.206	0.217	0.129
Control Delay, s/veh	4.4	6.0	5.5	4.7
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	88	63	61	197	51	85	234	35	35	534	245
Future Volume (vph)	143	88	63	61	197	51	85	234	35	35	534	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1763		3467	1881	1599	1787	3504		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1763		3467	1881	1599	1787	3504		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	154	95	68	66	212	55	91	252	38	38	574	263
RTOR Reduction (vph)	0	32	0	0	0	45	0	10	0	0	0	153
Lane Group Flow (vph)	154	131	0	66	212	10	91	280	0	38	574	110
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.7	18.1		4.4	14.8	14.8	7.1	36.3		3.5	32.7	32.7
Effective Green, g (s)	7.7	18.1		4.4	14.8	14.8	7.1	36.3		3.5	32.7	32.7
Actuated g/C Ratio	0.10	0.23		0.06	0.19	0.19	0.09	0.46		0.04	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	340	407		194	355	302	162	1624		79	1492	667
v/s Ratio Prot	c0.04	c0.07		0.02	c0.11		c0.05	c0.08		0.02	c0.16	
v/s Ratio Perm						0.01						0.07
v/c Ratio	0.45	0.32		0.34	0.60	0.03	0.56	0.17		0.48	0.38	0.16
Uniform Delay, d1	33.3	25.0		35.6	29.0	25.9	34.1	12.2		36.5	15.8	14.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.5		1.0	2.7	0.0	4.4	0.2		4.6	0.8	0.5
Delay (s)	34.3	25.5		36.6	31.7	26.0	38.5	12.5		41.1	16.6	14.8
Level of Service	C	C		D	C	C	D	B		D	B	B
Approach Delay (s)		29.7			31.7			18.7			17.1	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	78.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	2	478	2	35	2	1222	937	38	448	0
Future Volume (vph)	0	1	2	478	2	35	2	1222	937	38	448	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95	1.00	1.00	0.95	
Frt		0.91		1.00	0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1712		1698	1679		1072	2859	1583	1787	3574	
Flt Permitted		1.00		0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1712		1698	1679		1072	2859	1583	1787	3574	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	2	503	2	37	2	1286	986	40	472	0
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	382	0	0	0
Lane Group Flow (vph)	0	1	0	272	266	0	2	1286	604	40	472	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	100	100	0	0	0	0
Turn Type		NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		1.1		28.4	28.4		1.2	90.3	90.3	6.9	96.0	
Effective Green, g (s)		1.1		28.4	28.4		1.2	90.3	90.3	6.9	96.0	
Actuated g/C Ratio		0.01		0.19	0.19		0.01	0.60	0.60	0.05	0.64	
Clearance Time (s)		7.2		6.2	6.2		4.0	5.9	5.9	4.0	5.9	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		12		321	317		8	1721	952	82	2287	
v/s Ratio Prot		c0.00		c0.16	0.16		0.00	c0.45		c0.02	0.13	
v/s Ratio Perm									0.38			
v/c Ratio		0.08		0.85	0.84		0.25	0.75	0.63	0.49	0.21	
Uniform Delay, d1		73.9		58.7	58.6		74.0	21.6	19.2	69.8	11.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1		17.6	16.7		5.9	3.0	3.2	1.7	0.2	
Delay (s)		75.1		76.3	75.3		79.8	24.6	22.5	71.5	11.4	
Level of Service		E		E	E		E	C	C	E	B	
Approach Delay (s)		75.1			75.8			23.7			16.1	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.3
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	203	723	342
Demand Flow Rate, veh/h	205	730	345
Vehicles Circulating, veh/h	479	102	146
Vehicles Exiting, veh/h	353	389	538
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	8.8	15.5	7.5
Approach LOS	A	C	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	205	730	345
Cap Entry Lane, veh/h	700	1020	976
Entry HV Adj Factor	0.990	0.991	0.990
Flow Entry, veh/h	203	723	342
Cap Entry, veh/h	693	1011	967
V/C Ratio	0.293	0.715	0.353
Control Delay, s/veh	8.8	15.5	7.5
LOS	A	C	A
95th %tile Queue, veh	1	6	2

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	21	166	435	394
Demand Flow Rate, veh/h	21	168	439	398
Vehicles Circulating, veh/h	462	249	175	105
Vehicles Exiting, veh/h	41	365	308	312
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.4	6.1	9.4	7.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	21	168	439	398
Cap Entry Lane, veh/h	712	881	949	1017
Entry HV Adj Factor	1.000	0.988	0.991	0.990
Flow Entry, veh/h	21	166	435	394
Cap Entry, veh/h	712	870	940	1007
V/C Ratio	0.029	0.191	0.463	0.391
Control Delay, s/veh	5.4	6.1	9.4	7.8
LOS	A	A	A	A
95th %tile Queue, veh	0	1	2	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	253	65	145	167	63	206	1244	145	87	440	234
Future Volume (vph)	336	253	65	145	167	63	206	1244	145	87	440	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.97	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1823		3467	1881	1599	1787	3518		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1823		3467	1881	1599	1787	3518		1787	3574	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	361	272	70	156	180	68	222	1338	156	94	473	252
RTOR Reduction (vph)	0	8	0	0	0	55	0	7	0	0	0	160
Lane Group Flow (vph)	361	334	0	156	180	13	222	1487	0	94	473	92
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.1	24.5		9.2	20.6	20.6	17.6	51.3		5.0	38.7	38.7
Effective Green, g (s)	13.1	24.5		9.2	20.6	20.6	17.6	51.3		5.0	38.7	38.7
Actuated g/C Ratio	0.12	0.23		0.09	0.19	0.19	0.17	0.48		0.05	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	428	421		300	365	310	296	1702		84	1304	583
v/s Ratio Prot	c0.10	c0.18		0.04	0.10		0.12	c0.42		c0.05	0.13	
v/s Ratio Perm						0.01						0.06
v/c Ratio	0.84	0.79		0.52	0.49	0.04	0.75	0.87		1.12	0.36	0.16
Uniform Delay, d1	45.4	38.4		46.3	38.0	34.7	42.1	24.5		50.5	24.6	22.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.1	9.8		1.6	1.1	0.1	10.2	6.6		134.1	0.8	0.6
Delay (s)	59.5	48.2		47.9	39.1	34.7	52.3	31.0		184.6	25.4	23.2
Level of Service	E	D		D	D	C	D	C		F	C	C
Approach Delay (s)		54.0			41.8			33.8			43.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix E
Existing Roadway Volume Summary Reports

Weekly Volumes

Unit ID: TW #1
Location: Los Altos Pkwy
Comments: Northbound

Week of 08/14/2017

Start Time	08/14 Mon	08/15 Tue	08/16 Wed	08/17 Thu	08/18 Fri	08/19 Sat	08/20 Sun	Average
	NB	NB	NB	NB	NB	NB	NB	NB
00:00	-	48	56	-	-	-	-	52
01:00	-	27	23	-	-	-	-	25
02:00	-	16	17	-	-	-	-	17
03:00	-	12	16	-	-	-	-	14
04:00	-	17	18	-	-	-	-	18
05:00	-	23	25	-	-	-	-	24
06:00	-	56	59	-	-	-	-	58
07:00	-	166	180	-	-	-	-	173
08:00	-	171	176	-	-	-	-	174
09:00	-	188	181	-	-	-	-	185
10:00	-	203	199	-	-	-	-	201
11:00	-	218	225	-	-	-	-	222
12:00	-	255	238	-	-	-	-	247
13:00	-	240	289	-	-	-	-	265
14:00	-	345	370	-	-	-	-	358
15:00	-	484	479	-	-	-	-	482
16:00	-	624	581	-	-	-	-	603
17:00	-	710	682	-	-	-	-	696
18:00	-	568	574	-	-	-	-	571
19:00	-	394	433	-	-	-	-	414
20:00	-	307	323	-	-	-	-	315
21:00	-	214	233	-	-	-	-	224
22:00	-	118	138	-	-	-	-	128
23:00	-	84	69	-	-	-	-	77
Lane Total	-	5488	5584	-	-	-	-	5543
Day Total	-	5488	5584	-	-	-	-	5543
AM Peak	-	08:43	10:55	-	-	-	-	11:00
AM Count	-	220	226	-	-	-	-	222
PM Peak	-	17:16	17:16	-	-	-	-	17:00
PM Count	-	752	697	-	-	-	-	696

ADT: 5536

Weekly Volumes

Unit ID: TW #2
Location: Los Altos Pkwy
Comments: Southbound

Week of 08/14/2017

Start Time	08/14 Mon	08/15 Tue	08/16 Wed	08/17 Thu	08/18 Fri	08/19 Sat	08/20 Sun	Average
	SB	SB	SB	SB	SB	SB	SB	SB
00:00	-	8	13	-	-	-	-	11
01:00	-	9	13	-	-	-	-	11
02:00	-	9	12	-	-	-	-	11
03:00	-	39	45	-	-	-	-	42
04:00	-	99	95	-	-	-	-	97
05:00	-	259	260	-	-	-	-	260
06:00	-	572	563	-	-	-	-	568
07:00	-	689	690	-	-	-	-	690
08:00	-	429	455	-	-	-	-	442
09:00	-	366	380	-	-	-	-	373
10:00	-	263	255	-	-	-	-	259
11:00	-	256	275	-	-	-	-	266
12:00	-	270	232	-	-	-	-	251
13:00	-	243	265	-	-	-	-	254
14:00	-	304	281	-	-	-	-	293
15:00	-	267	267	-	-	-	-	267
16:00	-	295	306	-	-	-	-	301
17:00	-	340	371	-	-	-	-	356
18:00	-	282	296	-	-	-	-	289
19:00	-	200	223	-	-	-	-	212
20:00	-	142	129	-	-	-	-	136
21:00	-	81	95	-	-	-	-	88
22:00	-	37	42	-	-	-	-	40
23:00	-	29	32	-	-	-	-	31
Lane Total	-	5488	5595	-	-	-	-	5548
Day Total	-	5488	5595	-	-	-	-	5548
AM Peak	-	06:34	06:29	-	-	-	-	07:00
AM Count	-	795	796	-	-	-	-	690
PM Peak	-	16:57	16:51	-	-	-	-	17:00
PM Count	-	345	382	-	-	-	-	356

ADT: 5542

REGIONAL TRANSPORTATION COMMISSION
Metropolitan Planning · Public Transportation & Operations · Engineering & Construction
Metropolitan Planning Organization of Washoe County, Nevada

March 7, 2017

FR: Chrono/PL 18~~3~~2-17

Mr. Ian Crittenden, Planner
Planning and Community Services Department
City of Sparks
431 Prater Way
Sparks, NV 89431

RE: PCN17-0011 (Miramonte Townhome Community)

Dear Mr. Crittenden,

The Regional Transportation Commission (RTC) has reviewed this request for a tentative map for 448 townhome lots on a site approximately 166 acres in size. This project is located near the end of Belmar Drive.

The 2035 Regional Transportation Plan (RTP) identifies Belmar Drive as a collector with low access control. To maintain arterial capacity, the following RTP access management standards should be adhered to:

Access Management Standards-Arterials[1] and Collectors

Access Management Class	Posted Speeds	Signals Per Mile and Spacing[2]	Median Type	Left From Major Street? (Spacing from signal)	Left From Minor Street or Driveway?	Right Decel Lanes at Driveways?	Driveway Spacing[3]
Low Access Control	35-40 mph	5 or less Minimum spacing 900 feet	Raised or painted w/turn pockets or undivided w/painted turn pockets or two-way, left-turn lane	Yes 350 ft. minimum	Yes	No	150 ft./200 ft.

[1] On-street parking shall not be allowed on any new arterials. Elimination of existing on-street parking shall be considered a priority for major and minor arterials operating at or below the policy level of service.
[2] Minimum signal spacing is for planning purposes only; additional analysis must be made of proposed new signals in the context of planned signalized intersections, and other relevant factors impacting corridor level of service.
[3] Minimum spacing from signalized intersections/spacing other driveways.

The policy Level of Service (LOS) standard for Belmar Drive is LOS D. Policy LOS for intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting corridor. This project should be required to meet all the conditions necessary to complete road improvements to maintain policy LOS standards.

The Traffic Impact Study prepared by Traffic Works and submitted with the application identified that access to the proposed project will access Los Altos Parkway via Belmar Drive, east of Vista Boulevard. All of the study intersections are anticipated to operate at acceptable LOS under the existing plus project conditions. However, the microsimulation analysis for the Los Altos/Vista Boulevard (south) westbound approach identifies the average queue length is anticipated to increase by approximately 449 feet over the baseline

conditions. It is recommended the westbound left turn pocket be extended to accommodate 400 feet of storage.
The RTP, the RTC Bicycle/Pedestrian Master Plan and the Nevada Department of Transportation Pedestrian Safety Action Plan all indicate that new development and re-development will be encouraged to construct pedestrian and bicycle facilities, internal and/or adjacent to the development, within the regional road system. Also, these plans recommend that the applicant be required to design and construct any sidewalks along the frontage of the property in conformance with the stated ADA specifications.

Thank you for the opportunity to comment on this application. Please feel free to contact me at 775-332-0174 if you have any questions or comments.

Sincerely,

Rebecca Kapuler

Rebecca Kapuler
Planner

RK/jm

Copies: Jon Ericson, City of Sparks Public Works
Jae Pullen, NDOT District II
Daniel Doenges, Regional Transportation Commission
Julie Masterpool, Regional Transportation Commission
Tina Wu, Regional Transportation Commission
David Jickling, Regional Transportation Commission

/538 Miramonte Townhome Community

DEAR APPLICANT:

THE CITY OF SPARKS APPLICATION PROCESS REQUIRES THAT THE PROPERTY OWNER AUTHORIZE THE APPLICANT TO REQUEST DEVELOPMENT RELATED APPLICATIONS. DEVELOPMENT APPROVALS REMAIN WITH THE LAND; THEREFORE, THE PROPERTY OWNER IS ALWAYS RESPONSIBLE FOR ANY ACTIVITY ON THE PROPERTY.

OWNER AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, _____ being duly sworn, depose and say that I am an owner of property/authorized agent involved in this petition and that I authorize _____ to request development related applications on my property. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: _____

Title: _____

Signed _____

Subscribed and sworn to before me this _____ Day of _____, 20____.

_____
Notary Public in and for said County and State

My commission expires: _____

APPLICANT AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, Ryder NV Management, LLC being duly sworn, depose and say that I am the applicant involved in this petition and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true and correct to the best of my knowledge and belief. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

BOBBIE MERRIGAN
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 01-69506-2- Expires June 1, 2021

Name: Steve Thomsen

Title: General Manager

Signed: _____

Subscribed and sworn to before me this 20th Day of September, 2017.

Bobbie Merrigan
Notary Public in and for said County and State

My commission expires: 6.1.2021

DEAR APPLICANT:

THE CITY OF SPARKS APPLICATION PROCESS REQUIRES THAT THE PROPERTY OWNER AUTHORIZE THE APPLICANT TO REQUEST DEVELOPMENT RELATED APPLICATIONS. DEVELOPMENT APPROVALS REMAIN WITH THE LAND; THEREFORE, THE PROPERTY OWNER IS ALWAYS RESPONSIBLE FOR ANY ACTIVITY ON THE PROPERTY.

Below affidavit is limited to applications to remove or modify #14 conditions of approval for PCN04051 Tentative Map

OWNER AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF ~~WASHOE~~ Clark)

I, Fort Apache Homes, Inc. being duly sworn, depose and say that I am an owner of property/authorized agent involved in this petition and that I authorize _____ to request development related applications on my property. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: John Hui

Title: President

Signed _____

Subscribed and sworn to before me this 13 Day of Nov, 20 18.

_____
Notary Public in and for said County and State

My commission expires: March 6 2022

PAUL CHONG
NOTARY PUBLIC
STATE OF NEVADA
APPT. NO. 14-13034-1
MY APPT. EXPIRES MARCH 06, 2022

APPLICANT AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, _____ being duly sworn, depose and say that I am the applicant involved in this petition and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true and correct to the best of my knowledge and belief. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: _____

Title: _____

Signed: _____

Subscribed and sworn to before me this _____ Day of _____, 20_____.

_____
Notary Public in and for said County and State

My commission expires: _____

DEAR APPLICANT:

THE CITY OF SPARKS APPLICATION PROCESS REQUIRES THAT THE PROPERTY OWNER AUTHORIZE THE APPLICANT TO REQUEST DEVELOPMENT RELATED APPLICATIONS. DEVELOPMENT APPROVALS REMAIN WITH THE LAND; THEREFORE, THE PROPERTY OWNER IS ALWAYS RESPONSIBLE FOR ANY ACTIVITY ON THE PROPERTY.

OWNER AFFIDAVIT

STATE OF ~~NEVADA~~ Idaho)
) SS.
COUNTY OF ~~WASHOE~~ Gem)

I, MTA Development, LLC being duly sworn, depose and say that I am an owner of property/authorized agent involved in this petition and that I authorize _____ to request development related applications on my property. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: MARK F. ANDELIN

Title: MANAGER

Signed _____

Subscribed and sworn to before me this 18th Day of Oct, 2017.

_____
Notary Public in and for said County and State

My commission expires: 7-1-2018

PEGGY IRVING
Notary Public
State of Idaho

APPLICANT AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, _____ being duly sworn, depose and say that I am the applicant involved in this petition and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true and correct to the best of my knowledge and belief. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: _____

Title: _____

Signed: _____

Subscribed and sworn to before me this _____ Day of _____, 20_____.

_____
Notary Public in and for said County and State

My commission expires: _____

DEAR APPLICANT:

THE CITY OF SPARKS APPLICATION PROCESS REQUIRES THAT THE PROPERTY OWNER AUTHORIZE THE APPLICANT TO REQUEST DEVELOPMENT RELATED APPLICATIONS. DEVELOPMENT APPROVALS REMAIN WITH THE LAND; THEREFORE, THE PROPERTY OWNER IS ALWAYS RESPONSIBLE FOR ANY ACTIVITY ON THE PROPERTY.

OWNER AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, James and Dorothy Lyon Family Trust being duly sworn, depose and say that I am an owner of property/authorized agent involved in this petition and that I authorize Ryder NV Management, LLC to request development related applications on my property. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: James O. Lyon Trustee

Title: _____

Signed _____

Subscribed and sworn to before me this 20th Day of September, 2017.

Ronda Plamondon
Notary Public in and for said County and State

My commission expires: 6/3/2021

RONDA PLAMONDON
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 14-14736-2 - Expires June 3, 2021

APPLICANT AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, _____ being duly sworn, depose and say that I am the applicant involved in this petition and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true and correct to the best of my knowledge and belief. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: _____

Title: _____

Signed: _____

Subscribed and sworn to before me this _____ Day of _____, 20____.

_____
Notary Public in and for said County and State

My commission expires: _____

October 11, 2017

Ian Crittenden
Senior Planner
City of Sparks
431 Prater Way
Sparks, NV 89431

Re: Tentative Subdivision Map TTM PCN 04051 (Miramonte Tentative Map)
Amendment of Condition of Approval #14 (Roadway Improvements on Los Altos Parkway)

Dear Mr. Crittenden:

Reference is made to the Miramonte Tentative Map, the Application to Amend Condition of Approval #14 (Roadway Improvements on Los Altos Parkway) (Application), and the enclosed Owner Affidavit submitted as a part of the Application. The enclosed Owner Affidavit is submitted solely for the purpose of amending Condition of Approval #14 consistent with the traffic study prepared by Trafficworks dated September 8, 2017 and delivered to the City (notwithstanding the broader language of the Owner Affidavit). If you have any questions regarding this letter or the Owner Affidavit, please contact the undersigned at any time. Thank you for your work on the Amendment.

Sincerely,
Corona Miramonte, LLC

Its: Authorized Agent

This confirms to Corona Miramonte, LLC that, notwithstanding the broad language of the Owner Affidavit, Ryder NV Management, LLC will only use the Owner Affidavit for the purpose of amending Condition of Approval #14 as described above and will indemnify Corona Miramonte, LLC for damages caused by any use of the Owner Affidavit by Ryder NV Management, LLC other than as provided herein.

Ryder NV Management, LLC
By: Ryder Homes of Northern Nevada, Inc.
Its: Manager

Its: Authorized Agent

DEAR APPLICANT:

THE CITY OF SPARKS APPLICATION PROCESS REQUIRES THAT THE PROPERTY OWNER AUTHORIZE THE APPLICANT TO REQUEST DEVELOPMENT RELATED APPLICATIONS. DEVELOPMENT APPROVALS REMAIN WITH THE LAND; THEREFORE, THE PROPERTY OWNER IS ALWAYS RESPONSIBLE FOR ANY ACTIVITY ON THE PROPERTY.

Below Affidavit is limited to application to remove or modify #14 conditions of approval for PCN 04051 Tentative Map

OWNER AFFIDAVIT

STATE OF ~~NEVADA~~ Texas)
) SS.
COUNTY OF ~~WASHOE~~ Dallas)

I, Corona Miramonte, LLC being duly sworn, depose and say that I am an owner of property/authorized agent involved in this petition and that I authorize Ryder NV Management, LLC to request development related applications on my property. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: R. Scott Harris

Title: Authorized Signatory

Signed

Subscribed and sworn to before me this 25 Day of October, 2017.

Brenda A. Woodham
Notary Public in and for said County and State

My commission expires: 2-24-18

BRENDA A. WOODHAM
Notary Public, State of Texas
Comm. Expires 02-24-2018
Notary ID 595001-8

APPLICANT AFFIDAVIT

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

I, Ryder NV Management, LLC being duly sworn, depose and say that I am the applicant involved in this petition and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true and correct to the best of my knowledge and belief. I also give permission for site visitation by the Planning Commission, City Council and City Staff.

Name: _____

Title: _____

Signed: _____

Subscribed and sworn to before me this _____ Day of _____, 20____.

_____
Notary Public in and for said County and State

My commission expires: _____