# SUGARLOAF ESTATES

## MASTER PLAN AMENDMENT AND REGULATORY ZONE AMENDMENT APPLICATIONS

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**Prepared by:**

RUBICON DESIGN GROUP

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Job # 237-01

# SUGARLOAF ESTATES

**MASTER PLAN AMENDMENT AND REGULATORY ZONE AMENEMENT APPLICATION**

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## Introduction

This application includes the following requests:

- A **Master Plan Amendment** to re-designate 58.49± acres of property from a mix of Suburban Residential, Industrial, and Commercial to Suburban Residential.

- A **Regulatory Zone Amendment** to rezone 58.49± acres from a mix of Neighborhood Commercial, Industrial, and Low Density Suburban to Medium Density Suburban.

## Project Location

The Sugarloaf Estates site (APN 534-571-01) consists of 58.49± acres and is located in northern Spanish Springs. Specifically, the property is located on the north side of Calle de la Plata, east of Pyramid Highway. Figure 1 (below) depicts the project location.

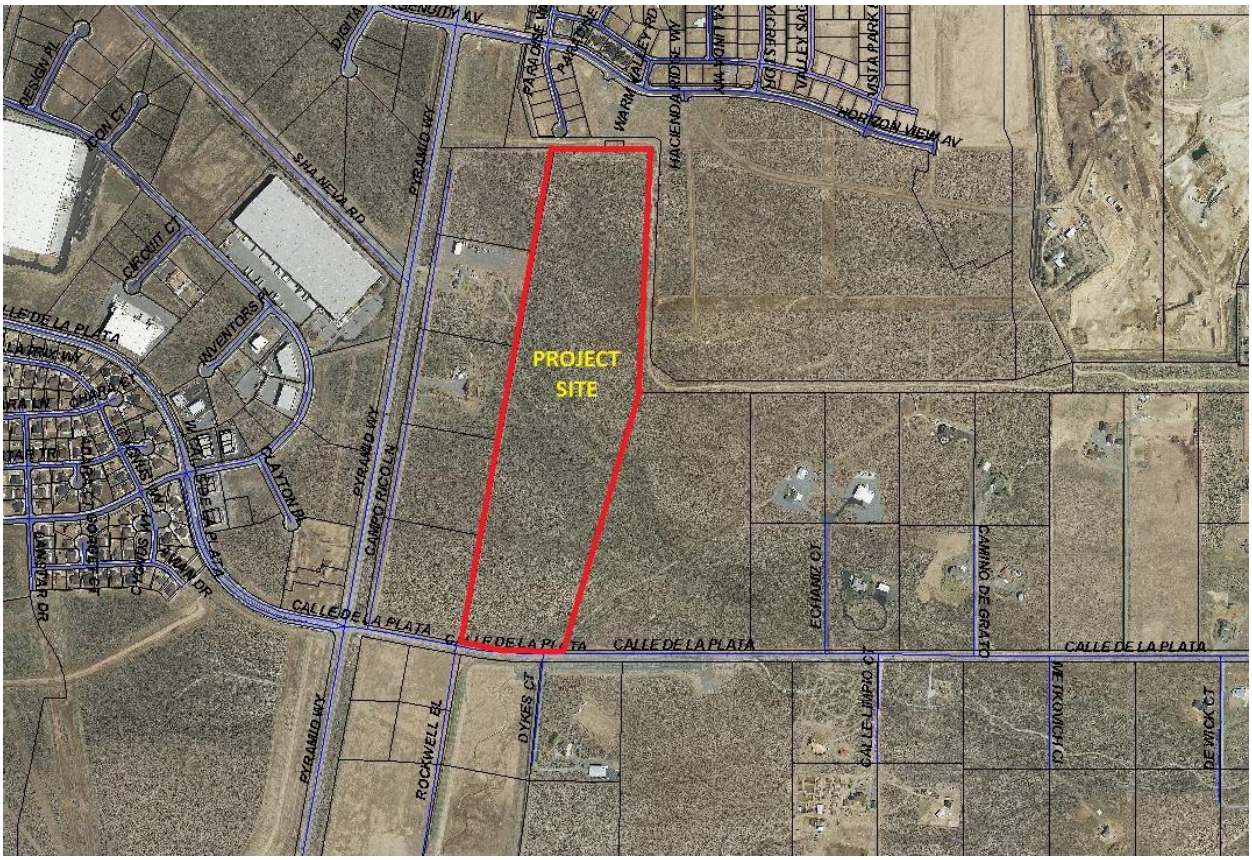



**Figure 1 – Vicinity Map**

## Existing Conditions

Currently, the project site is vacant. Surrounding land use includes vacant land and single family residential uses to the west, the "Shadow Mountain" subdivision to the north, vacant land to the east, and a regional storm water detention facility and single family to the south.

The Sugarloaf Estates property contains generally flat terrain and is accessed from Calle de la Plata on the south side. Figures 2 (below) and 3 (following page) depict the existing onsite conditions.

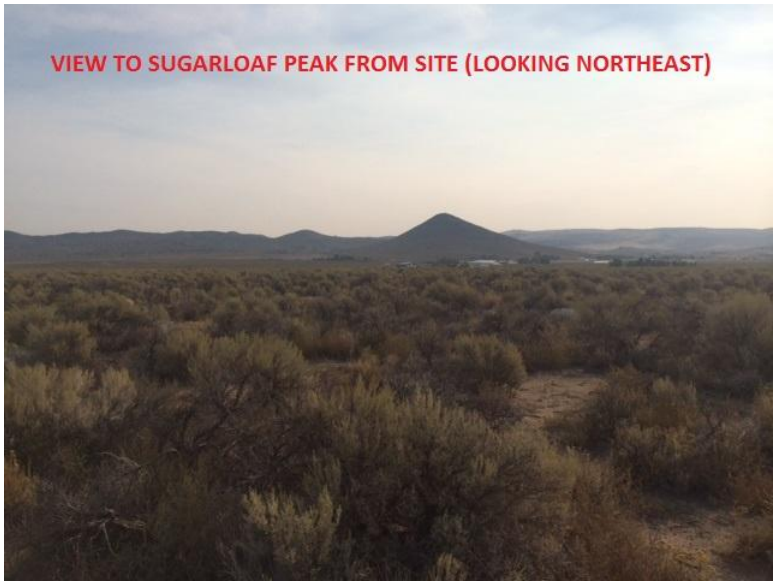
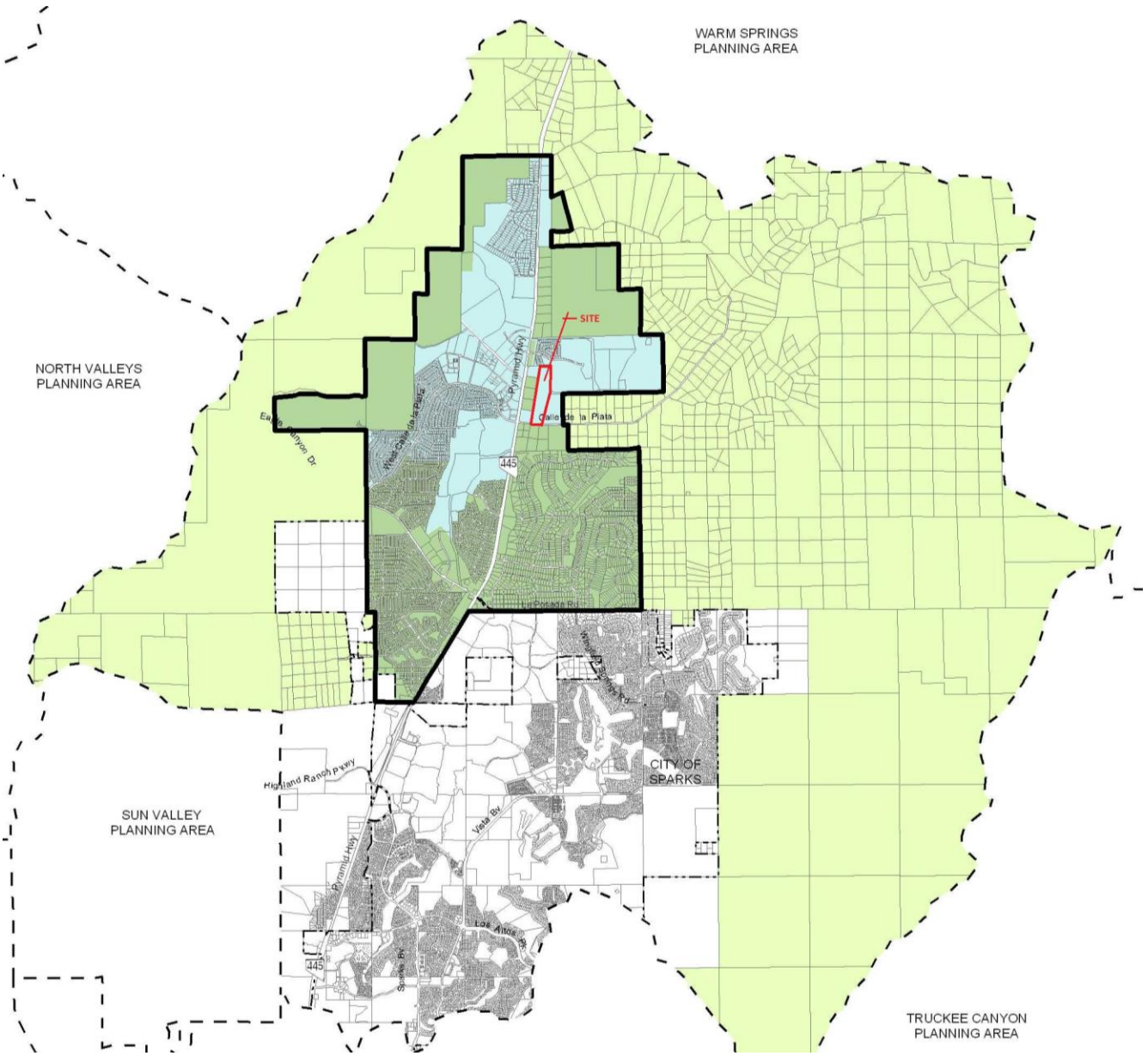




**Figure 2 – Existing Conditions**



**Figure 3 – Existing Conditions**

Sugarloaf Estates is located within the Spanish Springs Area Plan and is identified within the Suburban Character Management Area as defined in the Spanish Springs Character Management Plan. The Spanish Springs Area Plan states that the Suburban Character Management Area (SCMA) *"will be the designated growth area in the Spanish Springs Valley."* Figure 4 (below) depicts the project site in context with the SCMA.




**NOTE: SCMA boundary is outlined in bold.**

**Figure 4 – Suburban Character Management Area**

## Request Summary

This application includes two land use requests in order to establish Medium Density Suburban (MDS) zoning at the project site. The first is a Master Plan Amendment (MPA) from the current mix of Suburban Residential, Industrial, and Commercial to entirely Suburban Residential. The second request is a Regulatory Zone Amendment (RZA) from the current mix of Neighborhood Commercial, Industrial, and Low Density Suburban to MDS.

It is the intent of the project applicant to establish the necessary Master Plan and zoning designations to position the site for development of a common open space subdivision (described in subsequent sections of this report). It is important to note that this application is essentially the first step in establishing the proper zoning at the project site. It is planned to submit a tentative subdivision map (with common open space) in October 2015 with the intent that the tentative map "follow" the Master Plan Amendment and Regulatory Zone Amendment in terms of application/entitlement processing.

Each request is summarized below:

- **Master Plan Amendment**

Currently, the Sugarloaf Estates site includes a mixed Master Plan designation consisting of Suburban Residential, Industrial, and Commercial. These categories are split across the site with Suburban Residential to the north, Industrial in the central section of the site, and Commercial on the south. This application proposes to amend the Master Plan to Suburban Residential for the entire 58.49± acre site.

Per the Washoe County Master Plan Land Use and Transportation Element, the intent of the Suburban Residential designation is *"to provide for a predominantly residential lifestyle with supporting mixed-use nonresidential and residential uses, including commercial, public and semi-public facilities; parks and open space. A further goal of this group is to protect the stability of existing unincorporated neighborhoods and to encourage compatible smart growth development, while allowing diversity in lifestyle that is manifested in a variety of lot sizes, density, levels of mixed-use and land use patterns."*

In contrast, the Land Use and Transportation Element states that the intent of the Industrial Master Plan category is *"to provide for activities such as manufacturing, warehousing, mining and construction. The industrial designation is intended to create an environment in which industrial operations may be conducted with minimal impact on the natural environment and surrounding land uses."*

Like the Industrial designation, the Commercial designation fails to meet all of the locational criteria and would likely result in "strip" commercial which is "highly discouraged" in the Master Plan. Additionally, the Master Plan criteria calls for shared access between commercial uses, as does the Industrial. Given this criteria and the limited frontage along Calle de la Plata, a shared access between commercial and industrial uses would likely result with a single access to Calle de la Plata. This would result in a potentially hazardous situation for both automobiles and pedestrians and is inappropriate given the residential character of the area.

The Suburban Residential designation and its associated intent is highly logical for the Sugarloaf Estates site and surrounding area. However, the Industrial designation is out of place and has the potential to accommodate uses that could result in negative impacts to surrounding properties and single family residences. In fact, the Industrial designation is one of the most intense designations in terms of land use permitted in Washoe County. The County's own land use compatibility matrix identifies that the Industrial designation has a "low compatibility" with the designations that currently surround the site. The land use matrix also indicates that Neighborhood Commercial (NC) has a low compatibility with the MDS designation which is being sought under the RZA request included with this application. This is illustrated in Figure 5 (below) which is taken directly from the Washoe County Master Plan and clearly shows that Industrial and Commercial land uses have a "Low Compatibility" with all single family land uses such as those that surround Sugarloaf Estates.

| | LDR | MDR | HDR | LDS/ LDS 2 | MDS/ MDS 4 | HDS | LDU | MDU | HDU | PR | PSP | GC | NC | TC | I | GR/ GRR | OS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LDR | H | H | M | M | M | L | L | L | H | M | L | L | L | L | H | H | |
| MDR | H | H | H | M | M | M | L | L | H | M | L | L | L | L | M | H | |
| HDR | H | H | M | M | M | M | L | H | M | L | L | L | L | M | H | | |
| LDS/ LDS 2 | H | H | M | M | M | M | H | M | L | L | L | L | M | H | | | |
| MDS/ MDS 4 | H | H | M | M | H | M | L | L | L | L | M | H | | | | | |
| HDS | H | H | M | H | M | L | M | M | L | M | H | | | | | | |
| LDU | H | H | H | H | M | M | L | L | M | H | | | | | | | |
| MDU | H | H | H | M | M | L | M | L | H | | | | | | | | |
| HDU | H | H | M | M | M | M | L | H | | | | | | | | | |
| PR | H | H | H | H | M | H | H | | | | | | | | | | |
| PSP | H | H | H | M | H | H | | | | | | | | | | | |
| GC | H | H | M | L | H | | | | | | | | | | | | |
| NC | H | M | L | H | | | | | | | | | | | | | |
| TC | M | L | H | | | | | | | | | | | | | | |
| I | L | M | | | | | | | | | | | | | | | |
| GR/ GRR | H | | | | | | | | | | | | | | | | |
| OS | H | | | | | | | | | | | | | | | | |

H - High Compatibility: Little or no screening or buffering necessary.

M - Medium Compatibility: Some screening and buffering necessary.

L - Low Compatibility: Significant screening and buffering necessary.

**Regulatory Zones**

| Residential | Non-Residential |
|---|---|
| LDR - Low Density Rural | PR - Parks and Recreation |
| MDR - Medium Density Rural | PSP - Public and Semi-Public Facilities |
| HDR - High Density Rural | GC - General Commercial |
| LDS/LDS 2 - Low Density Suburban | NC - Neighborhood Commercial/Office |
| MDS/MDS 4 - Medium Density Suburban | TC - Tourist Commercial |
| HDS - High Density Suburban | I - Industrial |
| LDU - Low Density Urban | GR - General Rural |
| MDU - Medium Density Urban | GRR - General Rural Residential |
| HDU - High Density Urban | OS - Open Space |

Note: Plans for the amount of screening and buffering shall be made to the satisfaction of Washoe County Department of Community Development staff before completion of project review.

Source: Washoe County Department of Community Development

**Figure 5 – Washoe County Land Use Compatibility Matrix**

As noted previously, and described in the following section of this report, a zone change to Medium Density Suburban (MDS) is also included with this request. As the table included in Figure 5 illustrates, the MDS zoning provides for "High Compatibility" with all surrounding residential designations.

By redesignating the entire site as Suburban Residential (SR), a high land use compatibility with surrounding properties will be achieved. Additionally, the SR designation is a logical extension of existing SR land use to the north and east of the project site.

The Washoe County Master Plan establishes guidelines to gauge whether a land use is appropriate for any given parcel. In the case of Sugarloaf Estates, the site meets or exceeds all criteria outlined for the SR designation on pages 48 and 49 of the Land Use and Transportation Element. This includes:

A. **Housing** – Sugarloaf Estates is planned for single family development at approximately 3 units per acre (additional details included in subsequent sections of this report). This is in direct compliance with the Master Plan standard for SR which states that *"detached and attached homes are the predominant housing type."*

B. **Conservation** – The Master Plan calls for the preservation of natural terrain and scenic qualities. As stated previously, the Sugarloaf Estates property is flat and will not result in grading of steep slopes or any type of development that results in visual scarring, etc. Additionally, by incorporating a common open space development plan (future application), open space is preserved that will include recreational opportunities and connections to the regional trail network.

C. **Land Use and Transportation** – The Land Use and Transportation Element lists Medium Density Suburban (MDS) as an allowable zoning designation within the SR category. This application also includes a Regulatory Zone Amendment to rezone the site from a mix of NC, Industrial and LDS to MDS, consistent with the Washoe County Master Plan criteria.

D. **Public Services and Facilities** – Sugarloaf Estates meets or exceeds the standards for fire, EMS, and police response times, will be developed with municipal water and sewer, and far exceeds the distances from public schools outlined in the Master Plan.

In comparison, the Sugarloaf Estates site does not meet the criteria for the industrial and commercial designations outlined in the Land Use and Transportation Element, including standards related to access, traffic management, and public transit.

Figure 6 (following page) depicts the existing Master Plan designations for the Sugarloaf Estates site, while Figure 7 (page 9) depicts the proposed land use changes.

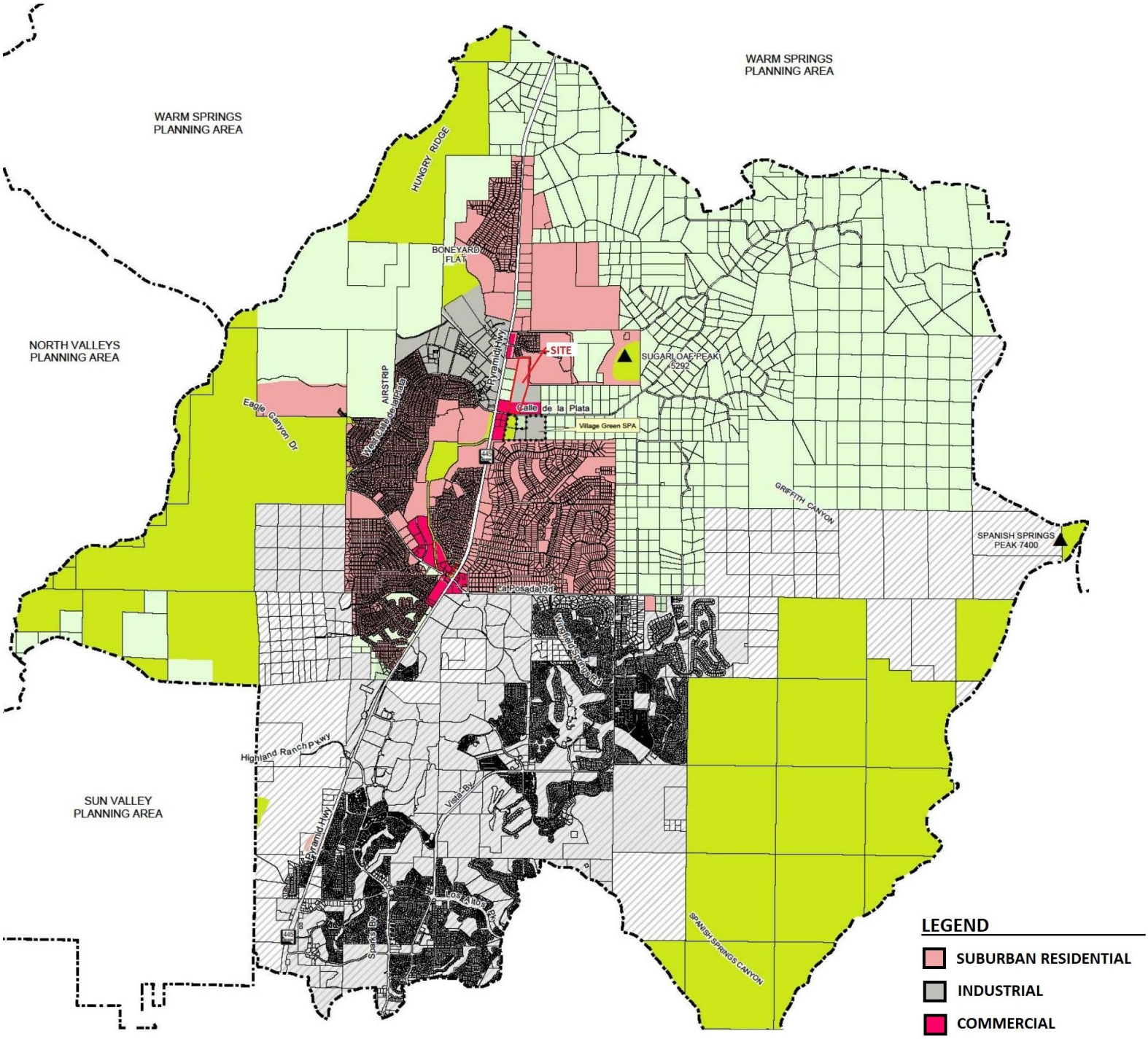



**Figure 6 – Existing Master Plan Designations**

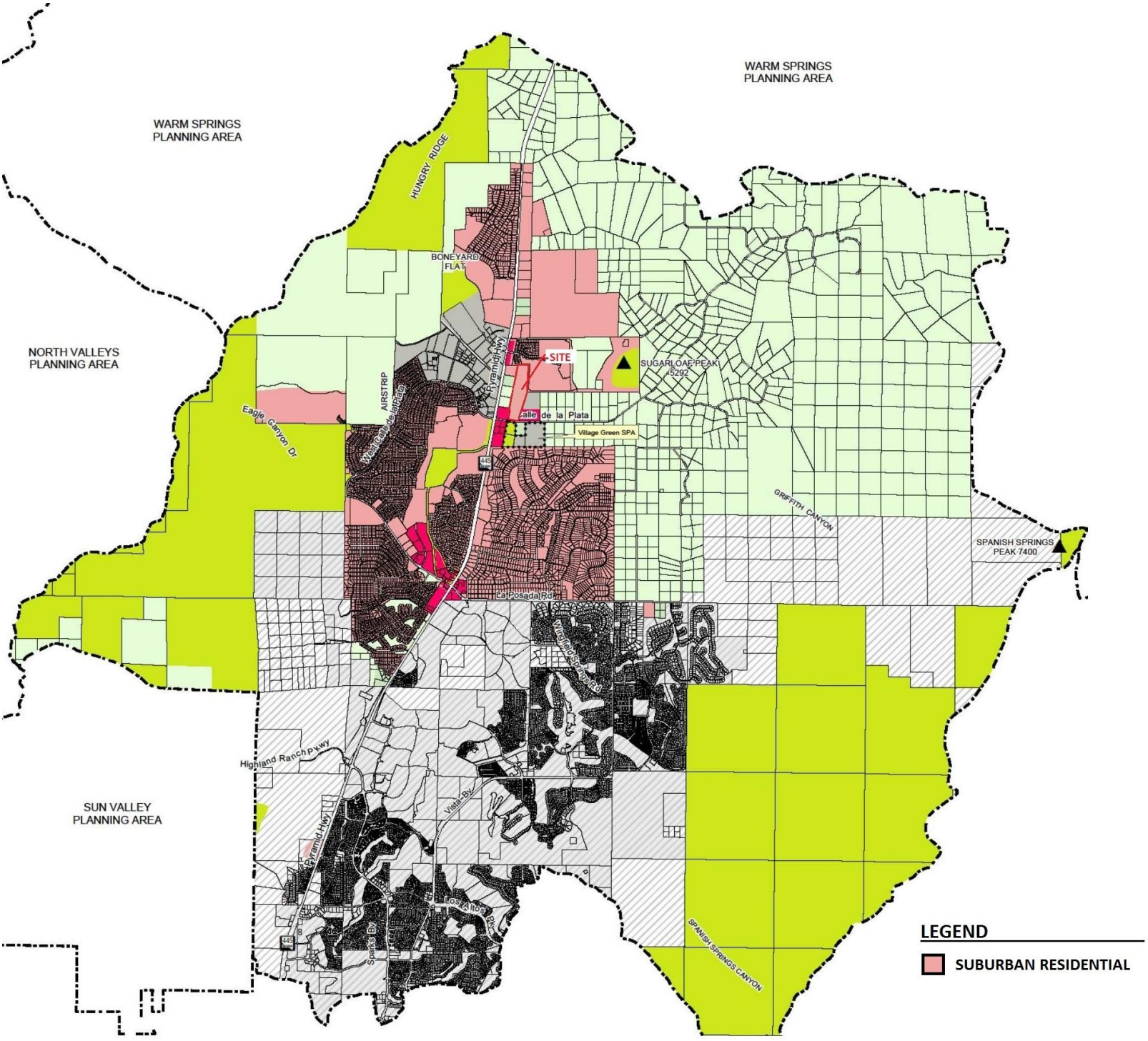



**Figure 7 – Proposed Master Plan Designations**

There are a variety of considerations when evaluating the requested Master Plan Amendment. As previously indicated, the criteria included within the Washoe County Master Plan for the placement of the Commercial and Industrial designations are not fully met under current conditions. Additionally, it is very important to consider the impacts that could result from the current Industrial and Commercial land uses. Locating an "island of industrial use" at the Sugarloaf Estates site does not represent comprehensive planning. Instead, it has the potential to develop highly intense operations that would not be compatible with adjoining single family uses in terms of intensity, noise, allowable building heights, traffic, etc. Similarly, commercial use at the project site is awkward at best and would include significantly higher trip generation along Calle de la Plata, including turning movements in and out of the site. Commercial use would be better suited along an arterial roadway or at the corner of Pyramid Highway and Calle de la Plata where it would have significantly higher exposure, etc.

The Planning Policy Analysis section of this report provides further analysis of applicable Washoe County Master Plan Goals and Policies and demonstrates how the proposed amendment serves to implement them along with goals and policies of the Spanish Springs Area Plan and Truckee Meadows Regional Plan.

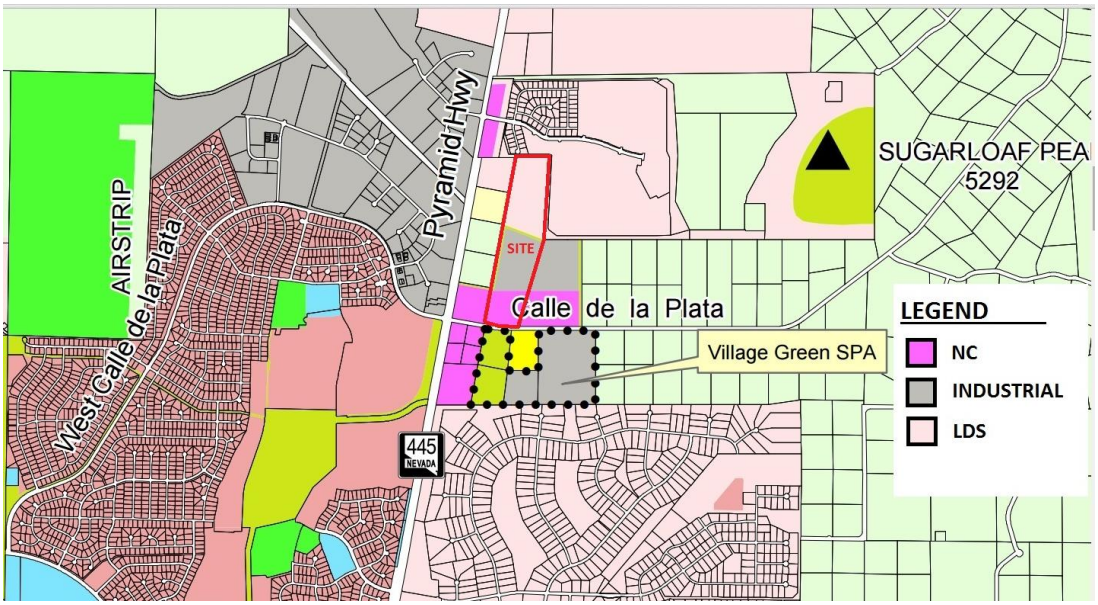
- **Regulatory Zone Amendment**

The second component of this request is a Regulatory Zone Amendment (RZA). Currently, the project site is zoned with a mix of Low Density Suburban (LDS), Industrial, and Neighborhood Commercial (NC) designations. Consistent with the requested SR Master Plan designation, it is requested that the zoning for the site be amended to Medium Density Suburban. The MDS designation will allow for single family residential development at a maximum density of 3 units per acre.

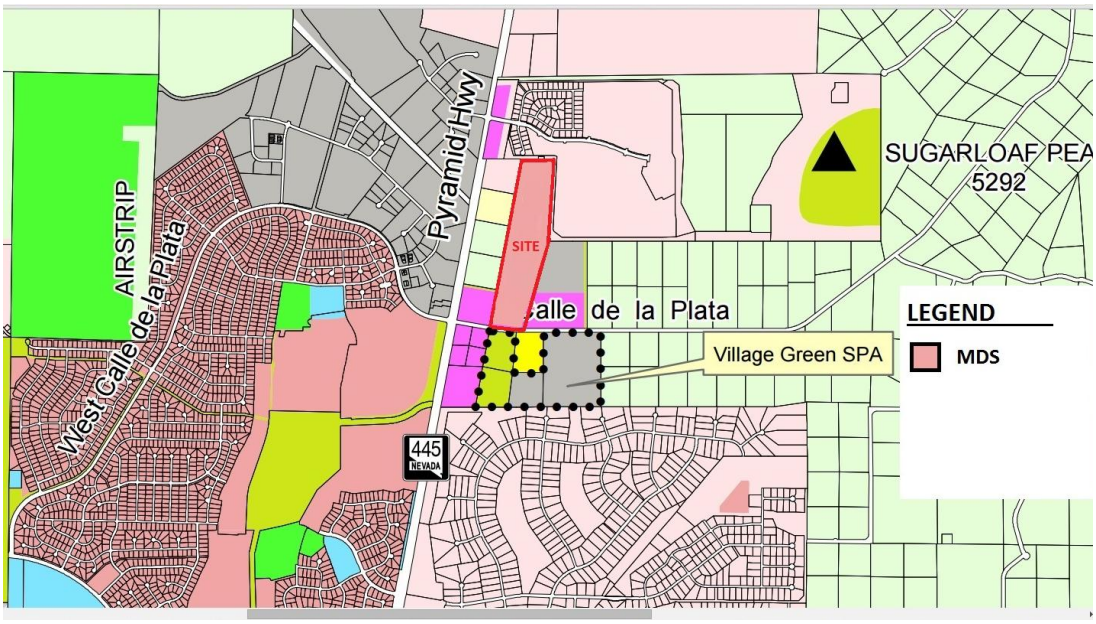
Generally, zoning patterns in the area are diverse and include a wide range of densities and intensities. The Sugarloaf Estates site is an example of this diversity with its inclusion of 3 separate designations ranging from one acre residential zoning to industrial; one, if not the most, intense zoning designations permitted in the County. There are areas of industrial zoning included on the south side of Calle de la Plata. However, these are included within the Village Green Specific Plan. Thus, those industrial uses include specific regulations in terms of use, buffering, screening, etc. while the "straight" industrial zoning at the project site does not. Other surrounding zoning includes NC, non-conforming General Rural (GR), Low Density Rural (LDR), and LDS to the west, LDS to the north, and LDS and Industrial to the east. In addition to the Industrial uses within the Village Green Specific Plan to the south, there is a large area of Open Space (OS) which is reflective of the flood control basin and detention facilities.

This eclectic mix of zoning to the west could be construed as "spot zoning" but is likely reflective of property owners wishing to remain classified at lower intensities for tax purposes when the last Area Plan update was completed. However, from a purely land use perspective, the current designations for the Sugarloaf Estates site are not logical, nor functional in a regional context. The elimination of the NC and Industrial designations are more in line with the residential character of the area. Also, there is additional NC zoning concentrated around the Pyramid Highway/Calle de la Plata intersection. This results in a "glut" of commercial uses in the area. As noted previously, extending commercial as far east as the Sugarloaf Estates site is not logical.

Figure 8 (below) depicts the existing and proposed zoning for the Sugarloaf Estates site.




**EXISTING ZONING**




**PROPOSED ZONING**

**Figure 8 – Existing/Proposed Zoning**

The parcel to the east currently includes NC and Industrial zoning as well. However, based on conversations with the property owner's representatives, there is intent to redesignate the property to MDS as well. As such, the redesignation of both Sugarloaf Estates and the adjoining parcel to the east would create a "block" of uniform zoning and eliminate the spot zoning conditions that occur now.

The Calle de la Plata/Pyramid Highway intersection has been a longtime concern of residents in regards to safety. The current NC and Industrial designations certainly have the potential to increase traffic on Calle de la Plata above and beyond what would result with the proposed MDS zoning, especially in terms of truck traffic and peak hour trips.

The proposed MDS zoning is consistent with the proposed SR Master Plan designation and will provide for single family use that is complementary to adjoining residential development to the north and is much more compatible with existing development to the west. Establishment of MDS densities at the site can serve to diversify the housing options within Spanish Springs while still retaining the overall community character and feel of the area.

The proposed MDS zoning also serves to implement goals and policies of the Truckee Meadows Regional Plan which encourages a variety of densities and housing types. The proposed 3 dwelling units per acre maximum density is well within the parameters permitted within the Regional Plan for unincorporated Washoe County and is compatible with the Suburban Character Management Plan included within the Spanish Springs Area Plan.

It is important to note that the Washoe County Master Plan designates the project site as an area "most suitable for development." As such, intensification of zoning is appropriate and will provide for more fiscally responsible development in terms of maximizing infrastructure utilization, etc. Figure 9 (following page) depicts the Development Suitability Map taken from the Spanish Springs Area Plan. It is noteworthy that the small portion of land shown to be affected by flooding is no longer applicable with the construction of regional flood facilities to the south

This report later contains a section entitled "Planning Policy Analysis", and provides a thorough review and analysis of the Washoe County Master Plan and Spanish Springs Area Plan. In that section, specific items are noted that support the requested change in zoning. These include policies and goals ranging from community character to infrastructure and development regulations.

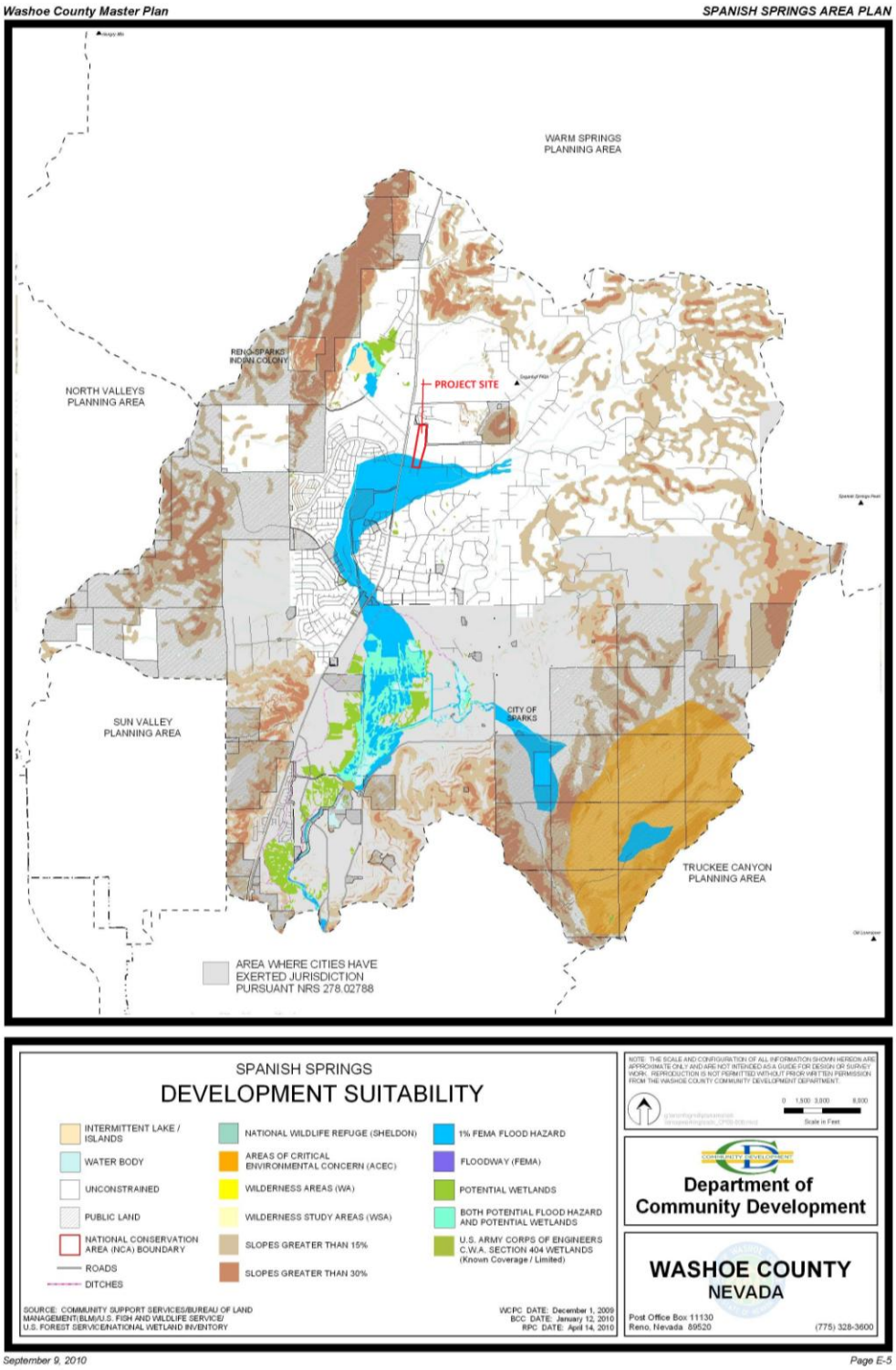



**Figure 9 – Development Suitability Map**

## Future Development

As noted previously, it is intended to follow this MPA/RZA request with a tentative subdivision map request, to be submitted in October 2015. It is recognized that a future development plan cannot be considered with the MPA and RZA as these requests must stand on their own merits and are not capable of being conditioned. However, in this case, there is a clear intent and project envisioned for the site. Therefore, preliminary details are presented to demonstrate how the requested land use and zoning designations will be implemented, further demonstrating compatibility with the surrounding area.

The plan developed for Sugarloaf Estates includes a common open space approach. Based on the proposed density of 3 dwelling units per acre allowed under the MDS zoning, 175 lots are planned for Sugarloaf Estates. Lots will be clustered in order to provide meaningful open space and regional trail connections. This includes a 6 and ¾ acre± central community park as well as a trail connection along the eastern boundary of the project, connecting the site with the regional trail that connects to Sugarloaf Peak.

In general, larger lots are located along the western perimeter to provide compatibility with existing homes to the west. Additionally, open space areas are strategically located on the western portion of the project to buffer existing homes from any potential impacts.

Access to and from the project will be via a primary connection with Calle de la Plata. Additionally, a roadway will be extended east into the neighboring project providing a secondary full access to Sugarloaf Estates. An emergency access easement to Calle de la Plata could be provided at the southwest corner of the project (if needed). This will ensure that proper emergency/secondary access is provided regardless of timing of the adjacent project.

As a common open space development, covenants, conditions, and restrictions (CC&R's) will be recorded and a homeowners association (HOA) will be created to maintain common areas and open space. With the subsequent tentative map application, specific details will be provided in regards to landscaping, fencing, etc. The project will provide constancy with the theming and development standards included in the Spanish Springs Area Plan. Furthermore, by clustering units, conservation of natural resources, especially water, will be achieved. It is envisioned that significant attention will be given to xeriscaping and drought tolerant plantings within common areas. In terms of the central park, details as to whether this will be dedicated to Washoe County or maintained by the HOA will be determined as part of the tentative map review process.

A comprehensive traffic impact analysis will also be included with the tentative map. It is recognized that the Pyramid Highway/Calle de la Plata intersection is a long-standing concern with area residents in terms of safety and operations. NDOT and Washoe County will review the traffic impacts of this project and the adjoining proposed project(s) to determine what improvements can and will occur. The project applicant is committed to working with NDOT and adjoining property owners/developers to investigate potential improvements to the intersection. The traffic impact analysis completed for the project is included as an attachment to this report.

Figure 10 (below) depicts the conceptual site plan developed for Sugarloaf Estates. This plan is preliminary and subject to change as engineering plans are completed, although significant changes are not anticipated. A final layout along with comprehensive engineering and landscape plans will be submitted to Washoe County in October 2015 as part of a tentative subdivision map (with common open space) request.

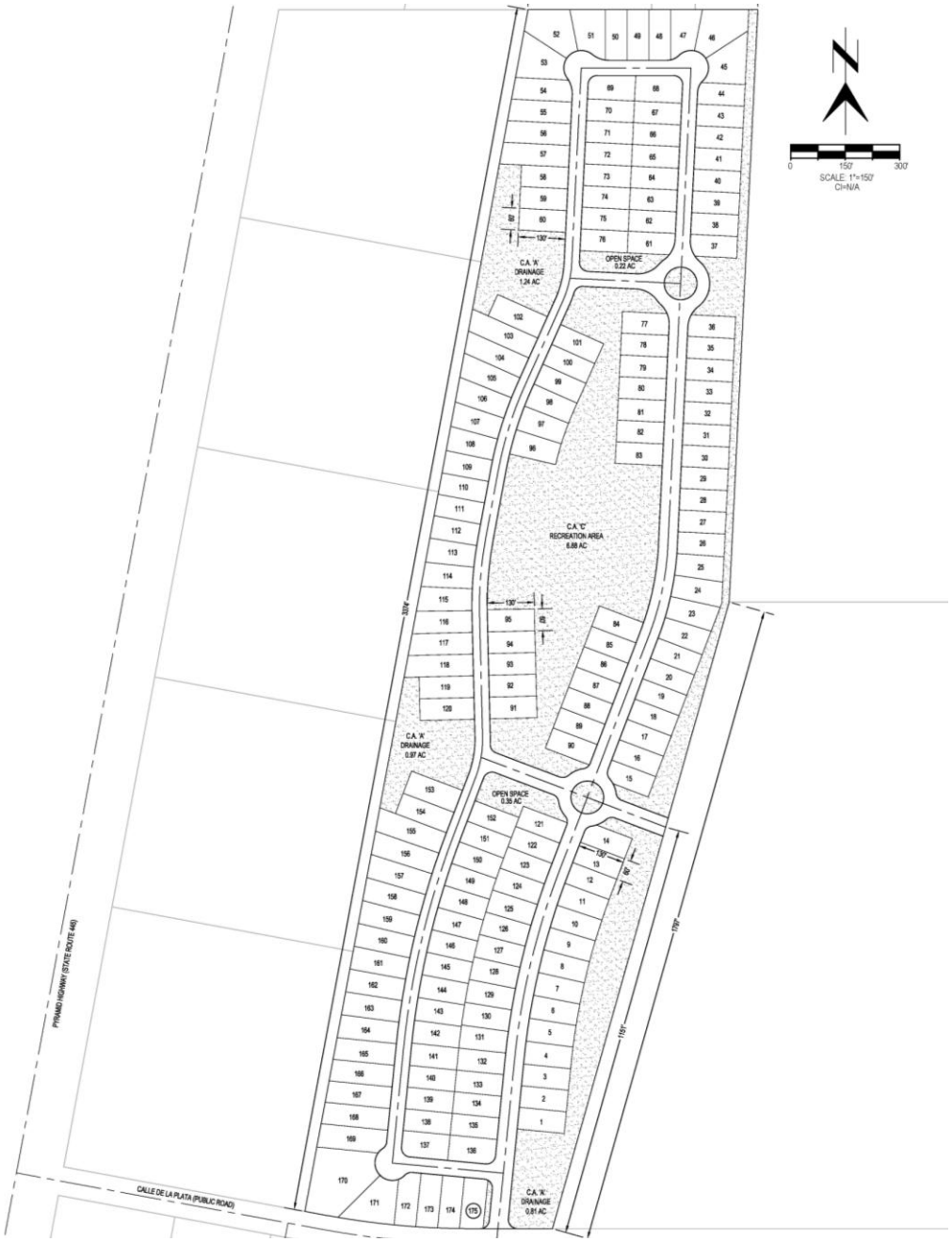



**Figure 10 – Sugarloaf Estates Conceptual Plan**

## Potential Impacts

It is very important to note that the MPA and RZA requests included with this application do not grant an entitlement to construct a new subdivision at the site. Rather, this is simply the first step in establishing the appropriate underlying land use designations for a future project. Therefore, a tentative subdivision map must be filed and approved in order to implement the Sugarloaf Estates plan. This tentative map application (to be filed in October 2015), will provide highly specific project details, impact analysis, infrastructure review, hydrology reports, etc. and is subject to review and approval through a publicly noticed hearing process.

This section aims to provide a cursory impact analysis based on the conceptual plan developed for the project, as presented in Figure 10.

- **Traffic**

Traffic is a measurable impact that will result no matter what is developed at the site. As part of this application and consistent with the Plan Maintenance section of the Spanish Springs Area Plan, a comprehensive traffic impact study, prepared by Star Consulting, is attached within the appendices of this report.

As noted in the attached traffic report, the intersection of Calle de la Plata and Pyramid Highway was highly analyzed. Currently, the intersection operates at level of service (LOS) F which does not meet service criteria established within the Area Plan or by the Regional Transportation Commission (RTC). However, with planned regional improvements, including the widening of Pyramid Highway from two to four lanes up to Calle de la Plata, LOS for the intersection rises to C, even with added traffic from Sugarloaf Estates.

With approval of Sugarloaf Estates, it is conceivable that roadway improvements listed on the RTP will be accelerated, especially considering that regional projects are re-evaluated and prioritized every 2 years. As part of the forthcoming tentative map review process, Star Consulting will be meeting with NDOT and representatives of the adjoining project to the east to suggest planned intersection improvements at Calle de la Plata and Pyramid Highway. The traffic analysis also suggests the construction of a dedicated left turn lane at the intersection for southbound traffic.

Overall, Sugarloaf Estates is anticipated to generate 131 am peak hour trips, 177 pm peak hour trips, and 1,675 average daily trips. It is important to note that the number of trips generated by the proposed residential use is a decrease from the number of trips that would likely occur under the current zoning (by as much as 58%). The traffic analysis concludes that the proposed development will have no measurable impact on the LOS of the adjacent roadway segments or intersections, when regional improvements are completed and that the adjacent roadways are currently operating under capacity.

Sugarloaf Estates can help spearhead long anticipated improvements, including improvements at Calle de la Plata/Pyramid Highway that have been a desire of the community for over a decade. Additionally, the project developer will be required to make a significant contribution in terms of traffic impact fees paid to RTC with final map approval.

Additional details are and analysis are attached in the full traffic impact study. Also, more in-depth traffic discussion will be relevant with the forthcoming tentative map (October 2015).

- **Schools**

As part of this MPA/RZA process, the Washoe County School District was consulted as to the current capacities of schools that serve the project area. It was determined that the project site is zoned for the following schools:

- Spanish Springs Elementary School
- Yvonne Shaw Middle School
- Spanish Springs High School

Mike Boster, Washoe County School District Planner, provided the School District's accepted student generation formulas along with the 2014/2015 enrollments and capacities for each school (2015/2016 enrollments have not been finalized as of the filing date of this application). Mr. Boster also indicated that capacities can be misleading based on special programs that may be occurring within the school facility. For example, elementary schools often have special education classes, gifted and talented programs, autism specialty programs, etc. which are capped by law on maximum classroom size. This can therefore skew actual capacity levels. Regardless, Mr. Boster concurred that the School District could provide refined enrollment and capacity numbers as part of this and a future public review process.

Once again, for the sake of this analysis, a density yield of 175 units was assumed. The following table summarizes potential school impacts.

| School | Current Enrollment[1] | Capacity[1] | Generation Rate[1] | Number of New Students |
|---|---|---|---|---|
| Spanish Springs ES | **713 students** | **772 students** | **0.277/unit** | **49 students** |
| Shaw MS | **1,008 students** | **1,072 students** | **0.064/unit** | **11 students** |
| Spanish Springs HS | **2,315 students** | **2,160 students** | **0.136/unit** | **24 students** |

1 – provided by the Washoe County School District.

It is important to note that this analysis does not consider the potential for children to attend charter schools, private institutions, or home schooling and is therefore a worst-case scenario in terms of student generation projections.

- **Public Facilities/Infrastructure**

The project site is located in an area of existing infrastructure. All municipal services (i.e. water, sewer, storm drain, etc.) are either in place or can easily be extended (at the developer's expense) to serve Sugarloaf Estates. Consistent with the policies of the Spanish Springs Area Plan and requirements of the Washoe County Development Code, all new lots within Sugarloaf Estates will be served by municipal water and sewer. In fact, these policies (detailed later in this report) further support the MDS zoning/density requested as it is not feasible to supply large lot residential units with these municipal services. Thus, if the property were to develop with lower density, individual well and septic systems would likely occur as they do in the immediate area. This is viewed as highly undesirable by Washoe County. Power, natural gas, cable television, and high speed internet service all exist at or adjacent to the project site.

Another noteworthy point is that the proposed clustering of units (through a common open space subdivision) will result in resource conservation, reduction in water use, etc. All of the applicable infrastructure will be analyzed and compliance will be demonstrated with the forthcoming tentative map request. For the purpose of the land use requests included with this application, the property meets or exceeds all criteria for the designations being requested.

- **Site Suitability**

As noted previously in this report, the site is well suited for the type of density potential associated with the requested designations. This is based on the fact that the site is flat and the availability of existing site services and infrastructure. In fact, the requested MDS zoning represents a down zoning in terms of intensity from which is permitted under the existing designation. Furthermore, the site is not encumbered by geologic, cultural, historical, or flood concerns that would preclude development. For reference, a feasibility geotechnical investigation is included in the appendices of this report.

- **Public Services**

The property is within an acceptable response time of the Truckee Meadows Fire Protection District station located on La Posada Drive to the south. Also, the Washoe County Sherriff's Office has existing patrols within the project area.

## Planning Policy Analysis

The proposed requests must be reviewed for consistency with the goals and policies of the Washoe County Master Plan, Sun Valley Area Plan, and Truckee Meadows Regional Plan. Each of these planning documents is addressed below:

- **Spanish Springs Area Plan**

The Spanish Springs Area Plan is an element of the Washoe County Master Plan that establishes the overall theme and vision that the community has in terms of how they wish to see Spanish Springs develop over the next 20 years. Last updated in 2010, there has been very little change within the plan area in the last 5 years. However, as the region's economy continues to recover, there is now opportunity to implement change within the plan area, consistent with the goals and policies of the Area Plan.

The Introduction section of the Area Plan states that the "*Spanish Springs community will maintain and apply objective standards and criteria that serve to manage growth and development in Spanish Springs in a manner that:*

- *Respects the rural heritage of the area by encouraging a rustic appearance and preserving scenic quality;*
- *Respects private property rights;*
- *Provides open space and recreational opportunities;*
- *Provides local services and employment opportunities;*
- *Ensures that growth is kept in balance with resources and infrastructure.*

This amendment request is entirely consistent with this intent of the Area Plan. The current Master Plan and zoning designations are in direct conflict with the first bullet point noted above. Industrial and commercial designations, located well east of Pyramid Highway will certainly not contribute to the rustic appearance and scenic character of the area. In contrast, Sugarloaf Estates will provide residential uses that will complement existing development patterns in the area as well as provide significant open space and linkages to regional trails. This is consistent with the first and third bullet point outlined in the Introduction of the Area Plan.

In terms of resources and infrastructure, amending the land use categories to residential is in actuality a down-zone in terms of intensity and will serve to better manage available resources and infrastructure The residential use proposed is far less intense than what could be developed under the existing zoning and will better complement the area as a whole.

The Vision of the Spanish Springs Area Plan is to *"manage growth in Spanish Springs, focusing on a rustic appearance in keeping with the rural character of the area, while respecting private property rights."* It can be logically argues that the current industrial and commercial designations conflict with the "rustic appearance" of the area, especially on the east side of Pyramid Highway. The residential use and density proposed, along with the planned open space, park, and trail facilities, are far more in line with the Area Plan vision.

The Area Plan also establishes an overall Character Statement. The first paragraph of the Character Statement states that *"over the next 20 years, the community will provide a range of employment opportunities and a more limited, but still mixed, range of residential opportunities. Over this period, the distribution of land uses and the provision of public facilities and infrastructure will preserve and facilitate a community character that merges Spanish Springs' scenic, low-density, rural and western heritage with suburban residential, employment, and commercial opportunities."* The Character Statement recognizes that a transition to more suburban densities will occur within Spanish Springs. The 3 du/ac density proposed with Sugarloaf Estates is complementary to suburban lot sizes to the north and matches that proposed to the east. There has been significant change in the area over the past 20 years and this application is reflective of proper planning and density given available infrastructure and developing land use patterns. The current commercial and industrial designations are simply not logical and out of place.

As noted previously and depicted in Figure 4, the project site is located within the Suburban Character Management Area defined in the Area Plan. This "suburban core" as discussed in the Character Statement includes *"residential densities of up to three dwelling units per acre."* The Character Statement goes on to state that *"suburban land uses are located predominantly, **but not exclusively**, on the west side of Pyramid Highway."* As part of this discussion, the Character Statement discusses transitions between the suburban core and more rural areas. The SR Master Plan designation and MDS zoning are consistent with the 3 du/ac suburban character identified in the plan and most definitely provide for a better transition to more rural areas to the east than the current industrial and commercial designations.

It is noteworthy that by Washoe County's own definition of "suburban," density is up to 7 units per acre (reflected in High Density Suburban zoning). The 3 du/ac density proposed with Sugarloaf Estates is less than half of this. Furthermore, Washoe County staff has agreed that the proposed density meets the suburban definition and character identified in the Area Plan and has determined that an amendment to the Character Statement is not needed as part of this Master Plan Amendment request.

Another noteworthy excerpt from the Character Statement is that *"the Suburban Character Management Area will be the designated growth area in the Spanish Springs Valley."* Given the fact that the Sugarloaf Estates site is flat, easily developed, and in an area where infrastructure exists or can easily be extended, not to mention located central to the Suburban Character Management Area, this request serves to implement the character and vision expressed in the Area Plan. The Character Statement goes on to note that *"an integrated trail system that provides access to regional and local open space*" is a community desire along with a *"desire for resource conservation in the community."* The plan for Sugarloaf Estates is directly compatible with this and provides trail linkages and open space connections to the regional network. Also, the clustering of units promotes resource conservation and greatly reduces water usage, etc. than if developed with larger lots.

The Area Plan also contains goals and policies that are applicable to this particular MPA and RZA requests. These policies are listed below and are addressed in **bold face** type. It is important to note that many of the policies are not applicable at this time but will be addressed with the forthcoming tentative map (i.e. policies related to grading, utilities, etc.).

*Goal One: The pattern of land use designations in the Spanish Springs Area Plan will implement and preserve the community character described in the Character Statement.*

**As described in the previous section, Sugarloaf Estates conforms to the Character Statement in terms of location within the Suburban Character Management Area, allowable suburban densities, preservation of open space, trail connections, and resource conservation.**

*SS1.2 The Policy Growth Level for the Spanish Springs Suburban Character Management Area is 1,500 new residential units of land use capacity. Land use intensifications will not add more than 1,500 new units of Land Use Capacity through 2025. The Washoe County Department of Community Development will be responsible for tracking increasing land use potential to ensure this growth level is not exceeded.*

**Sugarloaf Estates, at build out, represents 175 new residential units. Land use intensifications since the Plan adoption in 2010 have been limited based on economic conditions. Therefore, there is well over 1,000 residential units of capacity remaining of which 175 is only a small portion. The recent economic growth in the region has created a new demand for housing. It is clearly envisioned in the Spanish Springs Area Plan that new residential growth was anticipated in the area. Sugarloaf Estates is consistent with this anticipated growth as well as the Vision and Character Statement included in the Area Plan and is much better suited to meet community needs than the existing industrial and commercial designations.**

*SS.1.3 The following Regulatory Zones are permitted within the Spanish Springs Suburban Character Management Area:*

*c. Medium Density Suburban (MDS – Three units per acre).*

Note: Additional zoning categories listed in policy SS.1.3 are omitted as they are irrelevant to this request.

**The requested SR Master Plan designation and MDS zoning are in direct compliance with this policy.**

*SS.1.6 Staff will review any proposed Master Plan Amendment against the findings identified in the Plan Maintenance section of this plan and make a recommendation to the Planning Commission. As a minimum, the Planning Commission must make each of these findings in order to recommend approval of the amendment to the Board of County Commissioners.*

**The findings included under the Plan Maintenance section are addressed later in this report. Sugarloaf Estates is consistent with all of the findings.**

*SS.3.1 Washoe County's policy level of service (LOS) for local transportation facilities in the Spanish Springs planning area is LOS "C."*

**A detailed traffic impact analysis is included in the attached appendices. The report concludes that with planned improvements, all adjoining roadways/intersections will operate at appropriate levels of service. It is also important to note that overall traffic impacts are reduced with MDS zoning, as compared to the existing LDS/Industrial/NC mix.**

*SS.3.3 Washoe County will strongly advocate the prioritization of improvements to Pyramid Highway and qualified regional roads and arterials within the boundaries of this area plan in the Regional Transportation Improvement Program in order to achieve and maintain established levels of service.*

**Sugarloaf Estates can serve to expedite improvements to the Calle de la Plata/Pyramid Highway intersection, including widening of Pyramid Highway, lane improvements to Calle de la Plata and upgrades to the Calle de la Plata/Pyramid Highway intersection. These have been long standing community concerns that Sugarloaf Estates can help to solve and fund.**

*SS.3.5 Washoe County will be an advocate for restricted access to Pyramid Highway pursuant to the provisions of the Pyramid Highway Corridor Management Plan.*

**Consistent with this policy, no direct access to Pyramid Highway is proposed with Sugarloaf Estates. Instead, the project (and the adjoining development proposed) can serve to address long standing concerns with the Calle de la Plata/Pyramid Highway intersection to the benefit of the community as a whole.**

*Goal Four: Maintain open vistas of the surrounding ridges and more distant mountain ranges, and minimize the visual impact of hillside development.*

**The Sugarloaf Estates site is ideal for development at the densities permitted under MDS. The property is flat and development will have zero impact to hillsides, sensitive areas, etc. and will not obstruct views to Sugarloaf Peak or other surrounding ranges.**

*Goal Five: The built environment will implement and preserve the community character as described in the Spanish Springs Vision and Character Statement.*

**The project can serve to implement the Character Statement by providing a more appropriate transition between suburban uses and rural areas further east. The current industrial and neighborhood commercial designations are contradictory to the Vision and Character statement and have potential to generate much greater impacts upon the surrounding area.**

*Goal Six:* *Public and private development will respect the value of cultural and historic resources in the community.*

**There are no believed or known cultural or historical resources located on the Sugarloaf Estates site, ensuring consistency with this goal.**

*Goal Seven:* *The Spanish Springs planning area will contain an extensive system of parks and trails that provides the community and region with a broad range of recreational opportunities; provides connections between major developments, recreational facilities, the Regional Trail System, public lands and schools; and contributes to the preservation and implementation of the community character.*

**As depicted in Figure 10, Sugarloaf Estates will be developed in a clustered fashion that will provide for public trail connections from the site to the regional network. Additionally, land will be preserved and possibly dedicated (to be determined by Washoe County) for a public park central to the Sugarloaf Estates project.**

*SS.7.2* *New trails will be designed to accommodate equestrian, pedestrian and off-road bicycle traffic, unless technical or severe economic hardships warrant consideration of a more limited use.*

**All of the trails within Sugarloaf Estates will be public and will support the users listed within this policy. Additional details and specifications will be included with the forthcoming tentative map request.**

*SS.7.4* *As new residential and commercial properties develop in the Spanish Springs Valley, the Washoe County Department of Parks and Recreation will review development proposals for potential trail connections.*

**The project applicant will work directly with the parks department to determine final design of trails and parks facilities along with determining connection points to the regional network, etc.**

*SS.7.6* *Access to existing trails will be protected and improved wherever possible. During the process of development review, the Washoe County Departments of Community Development and Parks and Recreation will request dedication of property and/or easements when appropriate trail alignments have been identified that link significant nodes with the Spanish Springs planning area or connect existing trails.*

**Sugarloaf Estates will be in direct voluntary compliance with this policy and fully recognizes the importance of trail connectivity within the community.**

*SS.7.7 Development proposals and population trends will be evaluated on their impact to an established community standard of seven acres of community park per 1,000 residents. When warranted, the Washoe County Department of Parks and Recreation will request the dedication of an appropriate amount of community park acreage as property develops within the planning area.*

**There are currently no neighborhood parks on the east side of Pyramid Highway, north of Calle de la Plata. Sugarloaf Estates plans to provide a neighborhood park within the project that will not only serve project residents, but those in the immediate area as well. This will provide significant public benefit and potentially provide significant savings to Washoe County.**

*Goal Nine: The built environment will minimize the destructive potential of any identified geological hazard*.

**As detailed in the attached feasibility geotechnical investigation (included in appendices), there are no geological conditions that would preclude development of the site.**

*SS.12.1 Residential and commercial development must utilize one or a combination of the following reliable water resources that are replenished in quantities to meet the needs of the area without reliance upon groundwater mining or recharge from agricultural uses:*

- *a. Decreed Truckee River water rights or other approved imported surface water rights when used with an appropriate drought yield discount as determined by the water purveyor and approved by the State Engineer.*
- *b. Imported groundwater from a source that is replenished in sufficient quantity to meet the demands placed upon a source without groundwater mining.*
- *c. Certificated groundwater rights or permitted quasi-municipal groundwater rights (that existed as of May 22, 1990) matched by imported, decreed surface water from a source such as the Truckee River.*
    - *i. For residential developments, the quantity of imported water or decreed surface water shall be equal to 50 percent of the groundwater demand.*
    - *ii. For developments other than residential (commercial, industrial, recreational, etc.), the quantity of the matching imported or decreed surface water rights shall be equal to 100 percent of the calculated demand.*
    - *iii. The Truckee River surface water dedicated must be capable of diversion to the Orr Ditch.*

**It is premature to evaluate specific water rights at this time, but the forthcoming tentative map (planned for submittal in October 2015) will provide specifics on water demands and service.**

*SS.12.5 New residential subdivisions (e.g. tentative parcel map, tentative subdivision map) utilizing Medium Density Suburban land use densities (MDS: 1 du/ac to max. 3 du/1 ac) or greater densities approved after January 1, 1996 shall be required to use an imported water source, except subdivisions approved on land designated Medium Density Suburban prior to October 1, 1995.*

**Sugarloaf Estates will comply with the requirements of this policy. Further details will be provided with the forthcoming tentative map and are not directly relevant to the requests included with this application.**

*SS.12.7 The creation of parcels and lots in the Spanish Springs planning area shall require the dedication of water rights to Washoe County in quantities that are consistent with the water use standards set by the State Engineer and/or Washoe County.*

**Sugarloaf Estates will comply with the requirements of this policy. Further details will be provided with the forthcoming tentative map and are not directly relevant to the requests included with this application.**

*Goal Fifteen: Water resources will be provided to residential and non-residential uses in a manner that implements and preserves the community character as described in the Spanish Springs Vision and Character Statement.*

**As previously detailed, the project is indirect compliance with the Vision and Character Statement included in the Area Plan. This will include the manner in which water service is provided to the site and will be detailed with the forthcoming tentative map request.**

*SS.15.1 Whenever applicable, all development within the Spanish Springs Suburban Character Management Area will connect to a community water service.*

**Sugarloaf Estates will be served by a community water system. Individual wells are not being proposed.**

*Goal Sixteen: Wastewater treatment and disposal will be provided to residential and nonresidential uses in a manner that implements and preserves the community character as described in the Spanish Springs Vision and Character Statement.*

**Sugarloaf Estates will be served by sanitary sewer and not septic systems, serving to implement not only this goal, but numerous policies as well. It is also important to note that in order to make community water and sewer service available on a large scale (as encouraged in the Area Plan), additional density is needed in order to make it financially viable. Thus, services within the project could benefit adjoining parcels through the ability to hook up with municipal services that would not otherwise be available.**

*SS.16.1 Whenever applicable, all development within the Spanish Springs Suburban Character Management Area will connect to a community sewer service.*

**Sugarloaf Estates will connect with a community sewer system, consistent with this policy and a suburban development form.**

*Goal Seventeen: Amendments to the Spanish Springs Area Plan will be for the purpose of further implementing the Vision and Character Statement, or to respond to new or changing circumstances. Amendments must conform to the Spanish Springs Vision and Character Statement. Amendments will be reviewed against a set of criteria and thresholds that are measures of the impact on, or progress toward, the Vision and Character Statement.*

**As detailed throughout this report, Sugarloaf Estates is consistent with, and in many instances, serves to implement the Vision and Character Statement of the Spanish Springs Area Plan. The project site is identified within the Suburban Character Management Area which clearly allows for the density being proposed. Also, consistent with goals and policies of the Plan, the requested SR and MDS designations better serve to protect the character of the area and will have far less impact as compared to the existing designations for the site.**

*SS.17.1 In order for the Washoe County Planning Commission to recommend the approval of ANY amendment to the Spanish Springs Area Plan, the following findings must be made:*

*a. The amendment will further implement and preserve the Vision and Character Statement.*

**The project first directly within the framework of the goals and policies of the Area Plan and serves to implement the Vision of the Plan and preserve the character of the area, far more than what could occur at the site today under the existing designations. The project can serve to fulfill long term community needs such as a neighborhood park, trail connectivity, and roadway/intersection improvements and the designations being proposed are much more logical given the site location and character of surrounding properties.**

*b. The amendment conforms to all applicable policies of the Spanish Springs Area Plan and the Washoe County Master Plan.*

**This report contains detailed policy analysis from the Area Plan and Master Plan, demonstrating compliance.**

*c. The amendment will not conflict with the public's health, safety or welfare.*

**The project will promote the community's health, safety, and welfare by providing for more appropriate land use and improvements that will benefit the entire community, as detailed herein.**

*SS.17.2 In order for the Washoe County Planning Commission to recommend approval of any amendment involving a change of land use, the following findings must be made:*

*a. A feasibility study has been conducted, commissioned and paid for by the applicant, relative to municipal water, sewer and storm water that clearly identifies the improvements likely to be required to support the intensification, and those improvements have been determined to be in substantial compliance with all applicable existing facilities and resource plans for Spanish Springs by the Department of Water Resources. The Department of Water Resources will establish and maintain the standards and methodologies for these feasibility studies.*

**Sugarloaf Estates does not represent an intensification to the area. In fact, it will result in development far less intense than what is permitted under the current designations. As such, Washoe County has already determined the site to be appropriate for development based on these current designations and the fact that the site is included within the boundaries of the Suburban Character Management Area. A forthcoming tentative map request will provide highly detailed specifics. Granting of this Master Plan Amendment and zone change does not grant an underlying entitlement to develop (that must come in the form of a tentative map approval).**

*b. A traffic analysis has been conducted that clearly identifies the impact to the adopted level of service within the [unincorporated] Spanish Springs Hydrographic Basin and the improvements likely to be required to maintain/achieve the adopted level of service. This finding may be waived by the Department of Public Works for projects that are determined to have minimal impacts. The Department of Public Works may request any information it deems necessary to make this determination.*

**As noted previously, a highly detailed traffic impact analysis is included in the attached appendices and identifies no significant impacts occurring from the development of Sugarloaf Estates.**

*c. For commercial and industrial land use intensifications, the overall percentage of commercial and industrial regulatory zone acreage will not exceed 9.86 percent of the Suburban Character Management Area.*

**Not applicable.**

*d. For residential land use intensifications, the potential increase in residential units will not exceed Washoe County's policy growth level for the Spanish Springs Area Plan, as established in Policy SS.1.2.*

**With only 175 units, Sugarloaf does not increase units above the 1,500 cap established in policy SS.1.2, as previously addressed.**

*e. If the proposed intensification will result in a drop below the established policy level of service for transportation (as established by the Regional Transportation Commission and Washoe County) within the Spanish Springs Hydrographic Basin, the necessary improvements required to maintain the established level of service are scheduled in either the Washoe County Capital Improvements Program or Regional Transportation Improvement Program within three years of approval of the intensification. For impacts to regional roads, this finding may be waived by the Washoe County Planning Commission upon written request from the Regional Transportation Commission.*

**The attached traffic impact analysis identifies the need for improvements triggered by development of the project along with the applicable mechanisms for completing them. These can then be conditioned with the forthcoming tentative map.**

*f. If roadways impacted by the proposed intensification are currently operating below adopted levels of service, the intensification will not require infrastructure improvements beyond those articulated in Washoe County and Regional transportation plans AND the necessary improvements are scheduled in either the Washoe County Capital Improvements Program or Regional Transportation Improvement Program within three years of approval of the intensification.*

**The attached traffic impact analysis provides specific details that speak directly to this finding.**

*g. Washoe County will work to ensure that the long range plans of facilities providers for transportation, water resources, schools and parks reflect the policy growth level established in Policy SS.1.2.*

**As detailed previously in this section under policy SS.1.2, Sugarloaf Estates provides for consistency with all applicable requirements and polices.**

*h. If the proposed intensification results in existing facilities exceeding design capacity and compromises the Washoe County School District's ability to implement the neighborhood school philosophy for elementary facilities, then there must be a current capital improvement plan or rezoning plan in place that would enable the District to absorb the additional enrollment. This finding may be waived by the Washoe County Planning Commission upon request of the Washoe County Board of Trustees.*

**The Washoe County School District has provided enrollment numbers and student projections which are included in a previous section of this report. School District staff has indicated that they will provide specific comments and conditions (if applicable) at the tentative map stage of the project.**

*i. Any existing development in the Spanish Springs planning area, the Sun Valley planning area, the Warm Springs planning area, or the City of Sparks, which is subject to the conditions of a special use permit will not experience undue hardship in the ability to continue to comply with the conditions of the special use permit or otherwise to continue operation of its permitted activities.*

**Not applicable.**

- **Washoe County Master Plan**

The Washoe County Master Plan contains numerous goals and policies that support the requested Master Plan and Regulatory Zone Amendments included with this application. These policies are listed and addressed below:

**Conservation Element:**

*C.2.1 The Washoe County Department of Community Development shall maintain maps depicting valuable scenic areas, including but not limited to, prominent ridgelines, playas, and other unique scenic features. These maps shall be used to determine, in part, the land use and public services and facilities appropriate for each planning area. These maps, which may be specific to and contained within each Area Plan, shall also be used during development review to identify areas where scenic resource assessment and possible mitigation measures may be required.*

**The project site does not contain any significant natural features or resources and is identified in the Spanish Springs Area plan as an area "most suited for development."**

*C.2.3 Each development proposal shall be evaluated with the intent to preserve visually prominent ridges and escarpments. Evaluation shall address mitigation of the affects on visual appearance, scarring of hillsides, and the impact of increasing access in roadless areas.*

**The Sugarloaf Estates site is ideal in that development will not result in the grading of hillsides, visual scarring or grading of roadways through undeveloped parcels.**

*Goal Three: Regulate or mitigate development to protect environmentally sensitive and/or critical land, water and wildlife resources that present development hazards or serve highly valuable ecological functions.*

**Once again, development of the Sugarloaf Estates site will not result in any threat to protected resources, cultural sites, sensitive lands, etc. The project site is flat and well suited for development.**

*C.3.1 The Washoe County Department of Community Development shall adequately consult with other agencies while maintaining Development Suitability maps that depict valuable and/or critical land, water and wildlife resources or features which shall include, but not be limited to, the following:*

a. *Geothermal and mining areas.*
b. *Landslide, avalanche and rockfall areas.*
c. *Active and potentially active faults, and areas of potential ground shaking.*
d. *Slopes greater than 15 percent.*
e. *Sensitive soils.*
f. *Key wildlife habitats and migration routes.*
g. *Wild fire hazard areas (as specified by the respective fire agency).*
h. *One hundred year flood plains.*
i. *Perennial and intermittent streams, and wetlands.*

*This map series shall be used to determine the land use and public services and facilities appropriate for each planning area. These maps shall also be used during development review to identify areas where more detailed land and water resource information is needed. Where the information indicates a need, measures to protect these resources shall be required. The maps depicting development constraint areas and areas of biodiversity should be used as a reference tool only in reviewing development applications.*

**As indicated in the Spanish Springs Area Plan, the project site is identified as an area "most suitable for development." Additionally, minimal flooding concerns were alleviated with the construction of the regional detention facility located on the south side of Calle de la Plata. The appendices of this report also include a preliminary geotechnical investigation which identifies no significant issues.**

Goal Ten: Incorporate technical information on geologic hazards into the land use planning and development processes.

**A preliminary geotechnical investigation has been completed and included with this report to demonstrate that there are no identified constraints that would preclude development of the property.**

*C.16.1 Through the adoption of the Open Space and Natural Resource Management Plan and implementation of the policies contained in the Land Use and Transportation Element, Washoe County will promote and facilitate recreational use of green space by pedestrians and bicyclists, and provide access to public facilities, recreation, public transportation and open space.*

**The planned trails, trail connections, open space, and park proposed within Sugarloaf Estates will serve to implement this policy.**

**Housing Element:**

*Policy 1.5: Encourage development at higher densities where appropriate.*

**As explained throughout this document, the MDS zoning and associated 3 du/ac density is highly appropriate given the site characteristics, location, and the policies contained in the Area Plan. The MDS use will serve to better transition between more intense uses planned along Pyramid Highway and residential areas to the east and is much more suited to the site than industrial or commercial use types.**

*Program 1.5: The County will utilize its higher density zoning designations to allow for the most efficient use of land that has infrastructure in place or where the installation of infrastructure is planned. The County will consider installing minimum density requirements in mixed-use and/or high density areas.*

**Land Use and Transportation Element:**

*Goal One: Influence future development to abide by sustainable growth practices.*

**Clustering of lots, such as that proposed with Sugarloaf Estates, will reduce overall resource impacts, reduce water consumption, and serve to implement this goal.**

*LUT.1.1: Washoe County should define smaller areas where more intense suburban developments permitted (parallel with the Area Plan Suburban Character Management Area, or SCMA), and larger areas outside the suburban areas where development is strictly limited to retain the existing rural character (parallel with the Area Plan Rural Character Management Area, or RCMA).*

**The project site lies within the identified Suburban Character Management Area of the Spanish Springs Area Plan which allows for densities up to 3 units per acre, as proposed**.

*LUT.2.1: Allow flexibility in development proposals to vary lot sizes, cluster dwelling units, and use innovative approaches to site planning providing that the resulting design is compatible with adjacent development and consistent with the purposes and intent of the policies of the Area Plan. Development applications shall be evaluated with the intent to satisfy the minimum following criteria:*

a. *Directs development away from hazardous and sensitive lands.*
b. *Preserves areas of scenic and historic value.*
c. *Provides access to public land.*
d. *Retains agricultural uses, fire and windbreaks, wildlife habitat, wetlands, streams, springs and other natural resources. An adequate amount of prime resources must be retained in order to sustain a functioning ecosystem.*
e. *Accommodates the extension and connection of trail systems and other active and passive recreational uses.*
f. *Furthers the purposes and intent of the respective Area Plan.*
g. *Prevents soil erosion.*
h. *Encourages a minimum distance from residential dwellings to active recreation in parks.*

**Although more specific details will be provided in the forthcoming tentative map application, Sugarloaf Estates will implement this policy through a common open space design concept that provides for open space, recreational opportunities, trails, trail connection, and overall consistency with the Vision and Character of the Spanish Springs Area Plan.**

*Goal Three: The majority of growth and development occurs in existing or planned communities, utilizing smart growth practices.*

**Increasing residential densities and clustering units, as proposed with Sugarloaf Estates, is an accepted and well known smart growth practice.**

*LUT.3.1: Require timely, orderly, and fiscally responsible growth that is directed to existing suburban character management areas (SCMAs) within the Area Plans as well as to growth areas delineated within the Truckee Meadows Service Area (TMSA).*

**The project site is located within an identified Suburban Character Management Area as well as within the TMSA.**

*LUT.3.2: In order to provide a sufficient supply of developable land to meet the needs of the population, Area Plans shall establish growth policies that provide for a sufficient supply of developable land throughout the planning horizon of the next 20 years, with considerations to phase future growth and development based on the carrying capacity of the infrastructure and environment.*

**As discussed previously, the 175 units proposed with Sugarloaf Estates fits well within the growth policies established in the Spanish Springs Area Plan.**

*LUT.3.3: Single family detached residential development shall be limited to a maximum of five (5) dwelling units per acre.*

**At a proposed density of 3 du/ac, the project is in direct compliance with this policy.**

*LUT.3.5 Area Plans shall identify adequate land, in locations that support the regional form and pattern, for the residential, commercial, civic and industrial development needs for the next 20 years, taking into account land use potential within the cities and existing unincorporated centers, existing vacant lots, and resource and infrastructure constraints.*

**The site is identified as "most suitable" for development within the Spanish Springs Area Plan and is one of the few remaining larger (in excess of 40 acres) undeveloped parcels in the Suburban Character Management Area. As such, it is well suited to meet the future housing needs of Spanish Springs and the region.**

*LUT.4.1 Maintain a balanced distribution of land use patterns to:*

*a. Provide opportunities for a variety of land uses, facilities and services that serve present and future population;*
*b. Promote integrated communities with opportunities for employment, housing, schools, park civic facilities, and services essential to the daily life of the residents; and*
*c. Allow housing opportunities or a broad socio-economic population.*

**The proposed residential use is much more logical from a land use perspective than the existing commercial and industrial designations. It provides for a much more appropriate transition to residential areas to the east and will still locate residential uses within walking distance of planned commercial services located at Pyramid Highway and Calle de la Plata.**

*LUT.4.3 Encourage suburban development to provide a mix of residential densities and housing types in close proximity to retail/commercial.*

**Even though commercial use is being replaced with residential, there is a significant amount of planned commercial use within walking distance of the site. In fact, there is such an abundance of commercial use that amending the Sugarloaf Estates site from commercial to residential is highly logical.**

*LUT.4.4 Encourage new suburban developments to provide interconnected street networks (Photo 6) to improve fluidity between different land uses and encourage walking and cycling as viable and safe modes of transportation.*

**As depicted in Figure 10, the preliminary plan for Sugarloaf Estates calls for a connection into the proposed project to the east, establishing connectivity and secondary project access.**

*LUT.5.2 Proposed development plans shall be required to provide the minimum service standards as described in the Land Use and Transportation Plan.*

**As detailed previously under the Area Plan analysis, the project meets or exceeds all of the applicable standards.**

*LUT.5.3 New development shall not reduce the quality of service for existing residents and businesses nor reduce the ability of public agencies to provide quality service.*

**The site is located in an area of existing services and patrols and can easily be absorbed into the existing service framework. Any upgrades or improvements can be conditioned with the tentative map at the expense of the project developer.**

*LUT.6.1 Acknowledge the importance of Washoe County (including the incorporated cities of Reno and Sparks) in the continuing development of Northern Nevada's regional economic base.*

*a. Strengthen and support the identity of the region by encouraging land uses that both contribute to the character of the community and enable the area to sustain a viable economic base. Encourage land uses that preserve a quality of life and define a sense of place within the region*

**Sugarloaf Estates is consistent with the Vision of the Spanish Springs Area Plan and will promote a high quality of life through careful planning that will allow residents easy access to open space, trails, and recreational opportunities.**

*LUT.9.1 Create, maintain, and connect usable open space for aesthetic, recreational purposes and natural resource protection.*

*a. Development assurances shall provide that the open space will be used as intended and will be adequately maintained. The following measures shall be used as applicable:*

*i. Designate open space areas to a classification consistent with the intended use.*

*ii. Record Conditions, Covenants and Restrictions (with the County as an interested party) or other contractual agreement with specification of the intended use and prohibition of future sale of the property without consent of the County.*

*iii. Specify use of the property (e.g. common area) on recorded maps.*

*iv. Dedicate easements (with the County as an interested party) that specify the intended use.*

*v. Provide financial assurances for any proposed improvements within the open space.*

*vi. Provide mechanisms to assure perpetual maintenance of the open space.*

*vii. When a density bonus or density transfer is proposed, the parcel that is proposed to be use-restricted should be included as part of the tentative map.*

**Sugarloaf Estates will dedicate new public trails that serve not only the project, but provide connections to the regional trail network. This will benefit the entire community and help perpetuate the regional trail system in Spanish Springs.**

*LUT.9.5 Require the connection of open space; trail access and bikeway systems with regard to a multitude of different trail uses.*

As noted above, new trails within Sugarloaf Estates will provide for connectivity with and continuance of the regional trail network within the community.

*Goal Ten: The public has access to open space resources.*

**All open space areas, trails, and park facilities within Sugarloaf Estates will be dedicated to Washoe County or maintained for public use.**

*LUT.10.6 Promote an interconnected open space system that accommodates and provides efficient access to all reasonable trail uses.*

**Once again, the project will provide logical and thoughtful connections to the regional trail system throughout the planned community.**

*Goal Twelve: Washoe County should implement policy to acquire and preserve open space.*

**The project will preserve a significant amount of open space which will ensure proper land use relationships with adjoining properties as well as provide community recreational opportunities and amenities.**

*LUT.12.2 In reviewing development or other land use applications, the County shall consider open space values and other characteristics, which contribute to the open and rural character or unincorporated Washoe County.*

**The planned open space will serve to implement the Vision and Community Character sections of the Spanish Springs Area Plan. These components can be further conditioned with the forthcoming tentative map.**

*Goal Fourteen: Washoe County will, to the extent possible, create a cohesive interconnected trail network.*

**This project can serve to fill in a key gap in the regional trail network by providing a connection from the trail to the north to County facilities on the south side of Calle de la Plata. Such a connection across private land does not currently exist, eliminating the need for the County to acquire land or negotiate easements.**

*LUT.14.3 The County shall acquire trail right-of-way through purchase, lease, donation or dedication from any public or private entity. When appropriate and beneficial, existing roads and rights-of-way will be used.*

**With the proposed trail improvements, the project developer will directly implement this policy.**

*LUT.14.4 Trails shall be interconnected and provide for pedestrian, equestrian, bicycle, and motorized uses, where each use is warranted. Incompatible uses shall be appropriately separated.*

**Consistent with the policies of the Area Plan, the trails will accommodate pedestrians, off-road cyclists, and equestrian users. Further details and specifications will be provided with the forthcoming tentative map.**

*LUT.17.2 Suburban neighborhoods should be created with a discernible center. This is often a square, green space, or memorable center. A transit station can be located at this center.*

**As depicted in Figure 10, Sugarloaf Estates will implement this policy with the development of a large central open space/park area.**

*LUT.21.1 The design of new public facilities shall create a sense of community and connectivity among those who live, work and recreate within the community.*

*a. Neighborhoods should be planned to provide emphasis on land uses such as parks, schools and other civic uses that are centralized and act as a community center and promote community interaction.*

*b. Where needed, expand existing public facility links such as trails, paths, open space, and streets to create connectivity between communities.*

*c. Enhance the long-term attractiveness and economic viability through architectural and other man-made features.*

*d. Encourage developers to use varying design strategies to begin to establish a sense of community.*

**As explained throughout this report, Sugarloaf Estates will provide trails, open space, and recreational amenities that implement not only this policy but numerous policies from the Area Plan, along with the community vision.**

*LUT.25.1 Ensure that development proposals are in conformance with appropriate Master Plan policies and the relevant Area Plan policies.*

**The Planning Policy Analysis included in this report clearly demonstrates the project's conformance.**

**Population Element:**

*Goal Three: Plan for a balanced development pattern that includes employment and housing opportunities, public services and open spaces.*

**Establishment of suburban residential at the site is logical from a land use perspective as it provides for appropriate transitions to adjoining properties, offers recreational opportunities and amenities to residents, and is within a short distance of employment centers and planned commercial uses.**

- **Truckee Meadows Regional Plan**

Master Plan Amendment applications in Washoe County are required to complete a review by the Truckee Meadows Regional Planning Agency. This project advances many of the goals and policies of the *2012 Truckee Meadows Regional Plan*. In general, this application seeks to provide suburban residential development within an area already included within the Truckee Meadows Service Area (TMSA) boundary. Densities of up to 5 units per acre are allowed in unincorporated areas within the TMSA per the Regional Plan. Sugarloaf Estates fits well within these parameters.

More specifically, the project conforms to the goals and policies of the *Regional Plan*, as outlined below.

*GOAL 1.1* *Between 2007 and 2030, at least 99% of the region's population growth and 99% of the region's jobs growth will be located in the Truckee Meadows Service Areas (TMSA).*

**The project site is within the existing TMSA and serves to better respect natural resources and provide more efficient use of infrastructure as encouraged within the Regional Plan, Washoe County Master Plan, and Spanish Springs Area Plan.**

*Policy 1.1.3* *or Reno, Sparks, and Washoe County the Regional Plan defines Truckee Meadows Service Areas (TMSA) and Future Service Areas (FSA) that avoid environmental degradation, optimize infrastructure, and maintain a compact form while providing for a variety of living and working situations.*

**Sugarloaf Estates is well suited for development and will not result in environmental degradation. Smaller lots and clustering ensures better optimization of infrastructure and less impact on resources, especially water.**

*Policy 1.1.8* *The Regional Plan defines the Development Constraints Area (DCA) as an overlay upon the Truckee Meadows Service Areas and the Rural Development Area (see Map 3). The Development Constraints Area consists of playas, jurisdictional water/wetland in accordance with Section 404 of the Clean Water Act, designated FEMA floodway areas within the floodplain Zone AE floodways, significant water bodies, natural slopes over 30%, publicly-owned open space, and properties that are deed restricted to prevent development.*

**The site is not located within a Development Constraints Area.**

*GOAL 1.3* *Unincorporated Washoe County within the TMSA will support Module #1 by providing a development pattern that includes a range of residential densities appropriate to the location and typified by medium density, and shall include appropriate neighborhood or local serving retail uses, and employment opportunities designed to reduce trips, enhance housing affordability and promote jobs-housing balance.*

**The medium density proposed with the project directly complies with this policy. Furthermore, its close proximity to existing employment centers within Spanish Springs and planned commercial uses make it even more complementary to this policy.**

*Policy 3.5.1* *To be in conformance with the Regional Plan, the master plans, facilities plans, and other similar plans of local governments and affected entities must ensure that necessary public facilities and services to support new development are or will be available and adequate, based on adopted levels of services (LOS) at the time the impacts of new development occur.*

**Infrastructure is already in place around the site and can be easily extended to serve Sugarloaf Estates. Therefore, the concurrency requirements are met. A traffic analysis is included and provides mitigation measures that will be implemented to ensure LOS standards are met.**

## Request Findings

The Washoe County Development Code establishes legal findings that must be made by the Planning Commission and Board of County Commissioners in order to approve Master Plan Amendment and Regulatory Zone Amendment requests. These findings are listed below and are addressed in **bold face** type.

- **Master Plan Amendment**

When adopting an amendment, the Commission shall make all required findings contained in the area plan for the planning area in which the property that is the subject of the Master Plan amendment is located and, at a minimum, make at least three of the following findings of fact unless a military installation is required to be noticed, then in addition to the above, a finding of fact pursuant to subsection (6) shall also be made:

(1) Consistency with Master Plan. The proposed amendment is in substantial compliance with the policies and action programs of the Master Plan.

**The requested Suburban Residential designation will allow for the establishment of Medium Density Suburban (MDS) zoning. The MDS zoning is consistent with the site's location within the Suburban Character Management Area and is consistent with the goals, policies, vision, and character statement of the Spanish Springs Area Plan, as detailed previously within this report.**

(2) Compatible Land Uses. The proposed amendment will provide for land uses compatible with (existing or planned) adjacent land uses, and will not adversely impact the public health, safety or welfare.

**The requested amendment represents a decrease in intensification over what currently exists. This will provide for a much more appropriate transition between land uses and is far better suited for the property given surrounding land use patterns. Commercial and industrial uses would be inappropriate for the site and have the potential to create significant negative impacts within the area in terms of traffic, noise, buffering, etc.**

(3) Response to Change Conditions. The proposed amendment responds to changed conditions or further studies that have occurred since the plan was adopted by the Board of County Commissioners, and the requested amendment represents a more desirable utilization of land.

**The current designations could be considered "spot" zoning which is highly discouraged in modern planning practice. The proposed SR and MDS designations are much more logical, provide for proper land use transitions, and are consistent with the goals, policies, vision, and character statement of the Spanish Springs Area Plan. Additionally, the project can serve to meet the increased demand for housing within the region sparked by a large influx of new economic growth that has occurred, and continues to occur, within Washoe County and the surrounding region.**

(4) Availability of Facilities. There are or are planned to be adequate transportation, recreation, utility, and other facilities to accommodate the uses and densities permitted by the proposed Master Plan designation.

**As detailed throughout this report all facilities, services, and infrastructure needed to serve the site are existing or can be easily extended to serve Sugarloaf Estates. The project meets the requirements of the Area Plan in terms of services and infrastructure and will serve to better optimize facilities over larger lot alternatives.**

(5) Desired Pattern of Growth. The proposed amendment will promote the desired pattern for the orderly physical growth of the County and guides development of the County based on the projected population growth with the least amount of natural resource impairment and the efficient expenditure of funds for public services.

**The site is identified within the Spanish Springs Area Plan as "most suitable for development" and within the Suburban Character Management Area. Therefore, it has already been determined that development of this property represents orderly growth and is located within an area where new growth has long been anticipated.**

(6) Effect on a Military Installation. The proposed amendment will not affect the location, purpose and mission of the military installation.

**Not applicable.**

- **Regulatory Zone Amendment**

(1) Consistency with Master Plan. The proposed amendment is in substantial compliance with the policies and action programs of the Master Plan.

**As detailed in the Planning Policy Analysis section of this report the request RZA serves to implement numerous goals and policies of the Washoe County Master Plan and the Spanish Springs Area Plan.**

(2) Compatible Land Uses. The proposed amendment will provide for land uses compatible with (existing or planned) adjacent land uses, and will not adversely impact the public health, safety or welfare.

**This request does not grant the absolute right to develop the parcel. Instead, it establishes the land use framework that will allow for future consideration of a common open space tentative map. At that time, project specific impacts can be evaluated during a public review process and appropriate conditions can be added or changes made. From a pure land use perspective, suburban use at 3 du/ac is appropriate with the surrounding residential uses and is far more compatible than the existing industrial and commercial designations. This is further reinforced through the County's own land use compatibility matrix.**

(3) Response to Change Conditions.; more desirable use. The proposed amendment responds to changed conditions or further studies that have occurred since the plan was adopted by the Board of County Commissioners, and the requested amendment represents a more desirable utilization of land.

**There is currently an over abundance of industrial and commercial use along Calle de la Plata. The proposed MDS zoning is more complementary to surrounding development patterns and will serve to reduce project impacts when compared with what could be developed under the existing zoning. The property is well suited for development given its physical characteristics and location.**

(4) Availability of Facilities. There are or are planned to be adequate transportation, recreation, utility, and other facilities to accommodate the uses and densities permitted by the proposed amendment.

**As noted under the Master Plan Amendment findings, all facilities, services, and infrastructure needed to serve the site are existing or can be easily extended to serve Sugarloaf Estates. The project meets the requirements of the Area Plan in terms of services and infrastructure and will serve to better optimize facilities over larger lot alternatives.**

(5) No Adverse Affects. The proposed amendment will not adversely affect the implementation of the policies and action programs of the Washoe County Master Plan.

**As detailed in the Planning Policy Analysis section of this report, the project actually serves to implement goals and policies of the Master Plan and Area Plan. In fact, it is almost certain that additional goals and policies will be implemented with future development of a common open space subdivision at the site.**

(6) Desired Pattern of Growth. The proposed amendment will promote the desired pattern for the orderly physical growth of the County and guides development of the County based on the projected population growth with the least amount of natural resource impairment and the efficient expenditure of funds for public services.

**The subject site is identified as most suitable for development within the Area Plan and can serve to better meet the housing needs of the community. No environmental or other conditions exist that would preclude development of the property at the densities permitted within the MDS zone. The project can better maximize infrastructure usage providing for smart growth from both a planning and fiscal perspective.**

(7) Effect on a Military Installation When a Military Installation is Required to be Noticed. The proposed amendment will not affect the location, purpose and mission of the military installation.

**Not applicable.**

# APPENDICES

# Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Development staff at 775.328.3600.

| **Project Information** | **Staff Assigned Case No.:** _____ |
|---|---|
| Project Name: Sugarloaf Estates | |
| Project Description: | A Master Plan Amendment to redisignate 58.49 acres from a mix of Suburban Residential, Industrial, and Commercial to Suburban Residential and a Regulatory Zone Amendment to rezone the same property from a mix of LDS, I, and NC to MDS. |
| Project Address: 350 Calle de la Plata, Spanish Springs, 89441 | |
| Project Area (acres or square feet): 58.49+/- acres | |
| Project Location (with point of reference to major cross streets **AND** area locator): The site is located on the north side of Calle de la Plata, east of its intersection with Pyramid Highway (State Route 445). | |

| Assessor's Parcel No.(s): | Parcel Acreage: | Assessor's Parcel No(s): | Parcel Acreage: |
|---|---|---|---|
| 534-571-01 | 58.49 acres | | |
| | | | |

Section(s)/Township/Range: Section 23, T21, R20

**Indicate any previous Washoe County approvals associated with this application:**
Case No.(s).

## Applicant Information (attach additional sheets if necessary)

| **Property Owner:** | | **Professional Consultant:** | |
|---|---|---|---|
| Name: Jacie, LLC - c/o Douglass Properties, LLC | | Name: Rubicon Design Group, LLC | |
| Address: 3820 Lone Tree Ln. | | Address: 100 California Ave., Suite 202 | |
| Reno, NV | Zip: 89511 | Reno, NV | Zip: 89509 |
| Phone: 775-884-1896 | Fax: 884-4896 | Phone: 775-425-4800 | Fax: |
| Email: samuel@jucommercial.com | | Email: mrailey@rubicondesigngroup.com | |
| Cell: 775-443-7576 | Other: | Cell: 775-250-3455 | Other: |
| Contact Person: Samuel Douglass | | Contact Person: Mike Railey | |
| **Applicant/Developer:** | | **Other Persons to be Contacted:** | |
| Name: SP58, LLC | | Name: | |
| Address: 439 W. Plumb Ln. | | Address: | |
| Reno, NV | Zip: 89509 | | Zip: |
| Phone: 775-352-4200 | Fax: | Phone: | Fax: |
| Email: jgm@blackstonedevelopmentgroup.com | | Email: | |
| Cell: 520-400-4845 | Other: | Cell: | Other: |
| Contact Person: Josh Myers | | Contact Person: | |

## For Office Use Only

| | | | |
|---|---|---|---|
| Date Received: | Initial: | Planning Area: | |
| County Commission District: | | Master Plan Designation(s): | |
| CAB(s): | | Regulatory Zoning(s): | |

# Property Owner Affidavit

**Applicant Name:** SP58, LLC

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA )
)
COUNTY OF WASHOE )

I, William V. Nardiello,
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below 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 understand that no assurance or guarantee can be given by members of Planning and Development.

**(A separate Affidavit must be provided by each property owner named in the title report.)**

Assessor Parcel Number(s): 534-571-01

Printed Name William V. Nardiello

Signed William V. Nardiello

Address 4619 Byron Circle

Irving, TX 75038

Subscribed and sworn to before me this 28 day of July, 2015

Sheryl Pickle
Notary Public in and for said county and state

My commission expires: 10/10/16

(Notary Stamp)

NOTARY PUBLIC STATE OF TEXAS
Sheryl Pickle
My Commission Expires
10/10/2016

*Owner refers to the following: (Please mark appropriate box.)

- ☒ Owner
- ☐ Corporate Officer/Partner (Provide copy of recorded document indicating authority to sign.)
- ☐ Power of Attorney (Provide copy of Power of Attorney.)
- ☐ Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- ☐ Property Agent (Provide copy of record document indicating authority to sign.)
- ☐ Letter from Government Agency with Stewardship

# Property Owner Affidavit

**Applicant Name:** SP58, LLC

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA )
)
COUNTY OF WASHOE )

I, Patrick Douglass (Douglass Properties LLC),
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below 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 understand that no assurance or guarantee can be given by members of Planning and Development.

**(A separate Affidavit must be provided by each property owner named in the title report.)**

Assessor Parcel Number(s): 534-571-01

Printed Name Patrick Douglass

Signed

Address 3820 Lone Tree Lane

Reno, NV 89511

Subscribed and sworn to before me this 5th day of August, 2015.

(Notary Stamp)

Notary Public in and for said county and state

My commission expires: November 25, 2017

KAREN E. ALLEN
Notary Public, State of Nevada
Appointment No. 02-72949-5
My Appt. Expires Nov 25, 2017

*Owner refers to the following: (Please mark appropriate box.)

- ☒ Owner
- ☐ Corporate Officer/Partner (Provide copy of recorded document indicating authority to sign.)
- ☐ Power of Attorney (Provide copy of Power of Attorney.)
- ☐ Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- ☐ Property Agent (Provide copy of record document indicating authority to sign.)
- ☐ Letter from Government Agency with Stewardship

# Property Owner Affidavit

**Applicant Name:** SP58, LLC

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA )
)
COUNTY OF WASHOE )

I, Jennifer C. Felton aka Jennifer Traniello,
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below 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 understand that no assurance or guarantee can be given by members of Planning and Development.

**(A separate Affidavit must be provided by each property owner named in the title report.)**

Assessor Parcel Number(s): 534-571-01

Printed Name Jennier C. Felton aka Jennifer Traniello

Signed

Address 590 Hunter Lake St
Las Vegas, NV 89138

Subscribed and sworn to before me this 5th day of August 2015.

(Notary Stamp)

Notary Public in and for said county and state

My commission expires: 11/25/2017

KAREN E. ALLEN
Notary Public, State of Nevada
Appointment No. 02-72949-5
My Appt. Expires Nov 25, 2017

*Owner refers to the following: (Please mark appropriate box.)

- ☑ Owner
- ☐ Corporate Officer/Partner (Provide copy of recorded document indicating authority to sign.)
- ☐ Power of Attorney (Provide copy of Power of Attorney.)
- ☐ Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- ☐ Property Agent (Provide copy of record document indicating authority to sign.)
- ☐ Letter from Government Agency with Stewardship

# Property Owner Affidavit

**Applicant Name:** Sheila Caramella / JACIE LLC

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA )
)
COUNTY OF WASHOE )

I, Sheila Caramella (Jacie LLC),
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below 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 understand that no assurance or guarantee can be given by members of Planning and Development.

**(A separate Affidavit must be provided by each property owner named in the title report.)**

Assessor Parcel Number(s): 534-571-01

**State of Nevada**
**County of Washoe**

Printed Name Sheila Caramella (Jacie LLC)

Signed

**Signed and sworn before me on** 8-4-15
**by** Sheila Caramella

Jennifer L Stanfield
**Notary Public**

Address 6701 Hollywood Blvd
LA 90028

Subscribed and sworn to before me this 4 day of August, 2015.

(Notary Stamp)

Jennifer L Stanfield
Notary Public in and for said county and state

My commission expires: 6-11-2018

JENNIFER L. STANFIELD
Notary Public - State of Nevada
County of Washoe
APPT. NO. 14-13949-2
My App. Expires Jun. 11, 2018

*Owner refers to the following: (Please mark appropriate box.)

- ☐ Owner
- ☒ Corporate Officer/Partner (Provide copy of recorded document indicating authority to sign.)
- ☐ Power of Attorney (Provide copy of Power of Attorney.)
- ☐ Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- ☐ Property Agent (Provide copy of record document indicating authority to sign.)
- ☐ Letter from Government Agency with Stewardship

# Property Owner Affidavit

**Applicant Name:** SP58, LLC

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA )
)
COUNTY OF WASHOE )

I, Patrick Douglass on behalf of Nancie Malmquist,
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below 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 understand that no assurance or guarantee can be given by members of Planning and Development.

**(A separate Affidavit must be provided by each property owner named in the title report.)**

Assessor Parcel Number(s): 534-571-01

Printed Name Patrick Douglass on behalf of Nancie Malmquist

Signed

Address 3820 Lone Tree Lane

Reno, NV 89511

KAREN E. ALLEN
Notary Public, State of Nevada
Appointment No. 02-72949-5
My Appt. Expires Nov 25, 2017

Subscribed and sworn to before me this 5th day of August, 2015.

(Notary Stamp)

Karen E. Allen
Notary Public in and for said county and state

My commission expires: November 25, 2017

KAREN E. ALLEN
Notary Public, State of Nevada
Appointment No. 02-72949-5
My Appt. Expires Nov 25, 2017

*Owner refers to the following: (Please mark appropriate box.)

- ☐ Owner
- ☐ Corporate Officer/Partner (Provide copy of recorded document indicating authority to sign.)
- ☑ Power of Attorney (Provide copy of Power of Attorney.)
- ☐ Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- ☐ Property Agent (Provide copy of record document indicating authority to sign.)
- ☐ Letter from Government Agency with Stewardship

# STATUTORY FORM POWER OF ATTORNEY

THIS IS AN IMPORTANT LEGAL DOCUMENT. IT CREATES A DURABLE POWER OF ATTORNEY FOR FINANCIAL MATTERS. BEFORE EXECUTING THIS DOCUMENT, YOU SHOULD KNOW THESE IMPORTANT FACTS:

1. THIS DOCUMENT GIVES THE PERSON YOU DESIGNATE AS YOUR AGENT THE POWER TO MAKE DECISIONS CONCERNING YOUR PROPERTY FOR YOU. YOUR AGENT WILL BE ABLE TO MAKE DECISIONS AND ACT WITH RESPECT TO YOUR PROPERTY (INCLUDING YOUR MONEY) WHETHER OR NOT YOU ARE ABLE TO ACT FOR YOURSELF.

2. THIS POWER OF ATTORNEY BECOMES EFFECTIVE IMMEDIATELY UNLESS YOU STATE OTHERWISE IN THE SPECIAL INSTRUCTIONS.

3. THIS POWER OF ATTORNEY DOES NOT AUTHORIZE THE AGENT TO MAKE HEALTH CARE DECISIONS FOR YOU.

4. THE PERSON YOU DESIGNATE IN THIS DOCUMENT HAS A DUTY TO ACT CONSISTENT WITH YOUR DESIRES AS STATED IN THIS DOCUMENT OR OTHERWISE MADE KNOWN OR, IF YOUR DESIRES ARE UNKNOWN, TO ACT IN YOUR BEST INTERESTS.

5. YOU SHOULD SELECT SOMEONE YOU TRUST TO SERVE AS YOUR AGENT. UNLESS YOU SPECIFY OTHERWISE, GENERALLY THE AGENT'S AUTHORITY WILL CONTINUE UNTIL YOU DIE OR REVOKE THE POWER OF ATTORNEY OR THE AGENT RESIGNS OR IS UNABLE TO ACT FOR YOU.

6. YOUR AGENT IS ENTITLED TO REASONABLE COMPENSATION UNLESS YOU STATE OTHERWISE IN THE SPECIAL INSTRUCTIONS.

7. THIS FORM PROVIDES FOR DESIGNATION OF ONE AGENT. IF YOU WISH TO NAME MORE THAN ONE AGENT YOU MAY NAME A CO-AGENT IN THE SPECIAL INSTRUCTIONS. CO-AGENTS ARE NOT REQUIRED TO ACT TOGETHER UNLESS YOU INCLUDE THAT REQUIREMENT IN THE SPECIAL INSTRUCTIONS.

**8. IF YOUR AGENT IS UNABLE OR UNWILLING TO ACT FOR YOU, YOUR POWER OF ATTORNEY WILL END UNLESS YOU HAVE NAMED A SUCCESSOR AGENT. YOU MAY ALSO NAME A SECOND SUCCESSOR AGENT.**

**9. YOU HAVE THE RIGHT TO REVOKE THE AUTHORITY GRANTED TO THE PERSON DESIGNATED IN THIS DOCUMENT.**

**10. THIS DOCUMENT REVOKES ANY PRIOR DURABLE POWER OF ATTORNEY.**

**11. IF THERE IS ANYTHING IN THIS DOCUMENT THAT YOU DO NOT UNDERSTAND, YOU SHOULD ASK A LAWYER TO EXPLAIN IT TO YOU.**

1. DESIGNATION OF AGENT. I, NANCY MALMQUIST, do hereby designate and appoint PATRICK E. DOUGLASS, whose address is 3820 Lone Tree Lane, Reno, Nevada, 89511, and whose telephone number is (775) 771-2695, as my agent to make decisions for me and in my name, place and stead and for my use and benefit and to exercise the powers as authorized in this document.

2. DESIGNATION OF ALTERNATE AGENT. Not applicable.

3. OTHER POWERS OF ATTORNEY. Not applicable.

4. NOMINATION OF GUARDIAN. Not applicable.

5. GRANT OF GENERAL AUTHORITY. I grant my agent and any successor agent(s) general authority to act for me with respect to the following subjects:

(INITIAL each subject you want to include in the agents general authority. If you wish to grant general authority over all of the subjects you may initial "All Preceding Subjects" instead of initialing each subject.)

[NM] **Real Property**
[_____] Tangible Personal Property
[_____] Stocks and Bonds
[_____] Commodities and Options
[_____] Banks and Other Financial Institutions
[_____] Safe Deposit Boxes
[_____] Operation of Entity or Business
[_____] Insurance and Annuities
[_____] Estates, Trusts and Other Beneficial Interests
[_____] Legal Affairs, Claims and Litigation

[_____] Personal Maintenance
[_____] Benefits from Governmental Programs or Civil or Military Service
[_____] Retirement Plans
[_____] Taxes
[_____] All Preceding Subjects

6. GRANT OF SPECIFIC AUTHORITY. My agent MAY NOT do any of the following specific acts for me UNLESS I have INITIALED the specific authority listed below:

(**CAUTION:** Granting any of the following will give your agent the authority to take actions that could significantly reduce your property or change how your property is distributed at your death. INITIAL ONLY the specific authority you WANT to give your agent.)

[_____] Create, amend, revoke or terminate an inter vivos, family, living, irrevocable or revocable trust
[_____] Make a gift, subject to the limitations of NRS and any special instructions in this Power of Attorney
[_____] Create or change rights of survivorship
[_____] Create or change a beneficiary designation
[_____] Waive the principals right to be a beneficiary of a joint and survivor annuity, including a survivor benefit under a retirement plan
[_____] Exercise fiduciary powers that the principal has authority to delegate
[_____] Disclaim or refuse an interest in property, including a power of appointment

7. LIMITATION ON AGENT'S AUTHORITY. An agent that is not my spouse MAY NOT use my property to benefit the agent or a person to whom the agent owes an obligation of support unless I have included that authority in the Special Instructions.

8. SPECIAL INSTRUCTIONS OR OTHER OR ADDITIONAL AUTHORITY GRANTED TO AGENT: This Power is limited to the consummation of the sale and close of escrow of the real property located at 350 Calle De La Plata, Sparks, Nevada, with the Buyer Blackstone Development Group, Inc., including all zoning and entitlement issues.

9. DURABILITY AND EFFECTIVE DATE. (INITIAL the clause(s) that applies.)

[CMM] **DURABLE. This Power of Attorney shall not be affected by my subsequent disability or incapacity.**

[_____] SPRINGING POWER. Not applicable.

[NM] **I wish to have this Power of Attorney become effective immediately upon my signature.**

[NM] **I wish to have this Power of Attorney end on the close of escrow as referenced in paragraph 8, above.**

10. THIRD PARTY PROTECTION. Third parties may rely upon the validity of this Power of Attorney or a copy and the representations of my agent as to all matters relating to any power granted to my agent, and no person or agency who relies upon the representation of my agent, or the authority granted by my agent, shall incur any liability to me or my estate as a result of permitting my agent to exercise any power unless a third party knows or has reason to know this Power of Attorney has terminated or is invalid.

11. RELEASE OF INFORMATION. I agree to, authorize and allow full release of information, by any government agency, business, creditor or third party who may have information pertaining to my assets or income, to my agent named herein.

**12. SIGNATURE AND ACKNOWLEDGMENT. YOU MUST DATE AND SIGN THIS POWER OF ATTORNEY. THIS POWER OF ATTORNEY WILL NOT BE VALID UNLESS IT IS ACKNOWLEDGED BEFORE A NOTARY PUBLIC.**

**I sign my name to this Power of Attorney on** 22 July 2015, **at** RENO, NEVADA.

Nancy Malmquist

**NANCY MALMQUIST**

## CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

STATE OF NEVADA )
}ss.
COUNTY OF WASHOE )

On this 22nd day of July, in the year 2015, before me, a Notary Public, personally appeared NANCY MALMQUIST personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument, and acknowledged that she executed it. I declare under penalty of perjury that the person whose name is ascribed to this instrument appears to be of sound mind and under no duress, fraud or undue influence.

RITA KOLVET
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 99-3324-2 - Expires May 10, 2019

Rita Kolvet
NOTARY PUBLIC

# Community Services Department
# Planning and Development
# MASTER PLAN AMENDMENT APPLICATION

Community Services Department
Planning and Development
1001 E Ninth St., Bldg A.
Reno, NV 89520

Telephone: 775.328.3600

# Master Plan Amendment
# Supplemental Information

(All required information may be separately attached)

Chapter 110 of the Washoe County Code is commonly known as the Development Code. Specific references to Master Plan amendments may be found in Article 820, Amendment of Master Plan.

The Washoe County Master Plan describes how the physical character of the County exists today and is planned for the future. The plan is adopted by the community and contains information, policies and a series of land use maps. The Master Plan provides the essential framework for creating a healthy community system and helps guide decisions about growth and development in the County. The following are general types of requests the County receives to amend the Master Plan. Please identify which type of amendment you are requesting:

| | |
|---|---|
| ☑ | A request to change a master plan designation(s) from the adopted master plan and/or area plan maps |
| ☐ | A request to add, amend, modify or delete any of the adopted policies found in the elements of the Master Plan |
| ☐ | A request to add, amend, modify or delete any of the adopted policies in the area plans |
| ☐ | A request to add, amend, modify or delete specific language found in the area plans |
| ☐ | Other (please identify): |

Please complete this questionnaire to ensure consistent review of your request to amend the Washoe County Master Plan. Staff will review the application to determine if the amendment request is in conformance with the policies and language within the elements and area plans of the Master Plan or if the information provided supports a change to the plan. Please provide a brief explanation to all questions.

1. What is the Master Plan amendment being requested at this time?

This applicaton requests that 58.49+/- acres within the Spanish Springs Area Plan be redesignated from a mix of Suburban Residential, Industrial, and Commercial to Suburban Residential. Please refer to the attached report for a detailed description, supporting exhibits, and analysis.

2. What conditions have changed and/or new studies have occurred since the adoption of the Washoe County Master Plan that supports the need for the amendment request?

The project site is located within the Suburban Character Management Area and identified as "most suitable for development" in the Spanish Springs Area Plan. The property is much better suited for residential use given its location and the over abundance of commercial and industrially designated properties in the area. Please refer to the attached report for a detailed description and analysis.

3. Please provide the following specific information.
   a. What is the location (address or distance and direction from nearest intersection)? Please attach a legal description.

The Washoe County Assessor's Office designates the property address as 350 Calle de la Plata. A legal description is included in the attached title report.

   b. Please list the following (attach additional sheet if necessary):

| APN of Parcel | Master Plan Designation | Existing Acres | Proposed Master Plan Designation | Proposed Acres |
|---|---|---|---|---|
| 534-571-01 | SR, I, and NC | 58.49 | SR | 58.49 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

c. What are the adopted land use designations of adjacent parcels?

| | |
|---|---|
| North | Suburban Residential |
| South | Commercial |
| East | Suburban Residential and Industrial |
| West | Suburban Residential, Commercial, and General Rural |

4. Describe the existing conditions and uses located at the site or in the vicinity (i.e. vacant land, roadways, buildings, etc.):

The property is currently vacant. Refer to attached report for detailed photos of the project site and existing conditions.

5. Describe the natural resources associated with the site under consideration. Your description should include resource characteristics such as water bodies, vegetation, topography, minerals, soils and wildlife habitat.

The site is undeveloped and contains flat terrain with slopes generally less than 2%. The property includes sagebrush, rabbit brush, and other native grasses. There are no water bodies, geologic hazards, cultural resources, or historical resources known on the property. Refer to attached report for a detailed site analysis and photos of the existing conditions.

6. Describe whether any of the following natural resources or systems are related to the proposed amendment:

   a. Is property located in the 100-year floodplain? (If yes, please attach documentation of the extent of the floodplain and any proposed floodplain map revisions in compliance with Washoe County Development Code, Article 416, Flood Hazards, and consultation with the Washoe County Department of Public Works.)

| ☐ Yes | ☑ No |
|---|---|

   Explanation:

| |
|---|
| |

   b. Does property contain wetlands? (If yes, please attach a preliminary delineation map and describe the impact the proposal will have on the wetlands. Impacts to the wetlands may require a permit issued from the U.S. Army Corps of Engineers.)

| ☐ Yes | ☑ No |
|---|---|

   Explanation:

| |
|---|
| |

   c. Does property contain slopes or hillsides in excess of 15 percent and/or significant ridgelines? (If yes, please note the slope analysis requirements contained in Article 424, Hillside Development of the Washoe County Development Code.)

| ☐ Yes | ☑ No |
|---|---|

   Explanation:

| |
|---|
| |

d. Does property contain geologic hazards such as active faults; hillside or mountainous areas; is subject to avalanches, landslides, or flash floods; is near a stream or riparian area such as the Truckee River, and/or an area of groundwater recharge?

| ☐ Yes | ☑ No |
|---|---|

Explanation:

e. Does property contain prime farmland; is within a wildfire hazard area, geothermal or mining area, and/or wildlife mitigation route?

| ☐ Yes | ☑ No |
|---|---|

Explanation:

7. Please describe whether any archaeological, historic, cultural, or scenic resources are in the vicinity or associated with the proposed amendment:

| ☐ Yes | ☑ No |
|---|---|

Explanation:

8. Do you own sufficient water rights to accommodate the proposed amendment? (Amendment requests in some groundwater hydrographic basins [e.g. Cold Springs, Warm Springs, etc.] require proof of water rights be submitted with applications. Please provide copies of all water rights documents, including chain of title to the original water right holder.)

| ❑ Yes | ❑ No |
|---|---|

If yes, please identify the following quantities and documentation numbers relative to the water rights:

| | | | |
|---|---|---|---|
| a. Permit # | | acre-feet per year | |
| b. Certificate # | | acre-feet per year | |
| c. Surface Claim # | | acre-feet per year | |
| d. Other # | | acre-feet per year | |

e. Please attach a copy(s) of the water rights title (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources):

Information on water rights will be provided with the forthcoming tentative map.

f. If the proposed amendment involves an intensification of land use, please identify how sufficient water rights will be available to serve the additional development.

The amendment represents a de-intensification in land use. Water rights will be dedicated in accordance with the policies included in the Spanish Springs Area Plan at time of final map. Details on water rights and service will be provided in the forthcoming tentative map request to be submitted in October 2015. Refer to attached report for additional details.

9. Please describe the source and timing of the water facilities necessary to serve the amendment:

   a. System Type:

| | | |
|---|---|---|
| ❑ Individual wells | | |
| ❑ Private water | Provider: | |
| ☑ Public water | Provider: | Truckee Meadows Water Authority |

   b. Available:

| | | | |
|---|---|---|---|
| ☑ Now | ❑ 1-3 years | ❑ 3-5 years | ❑ 5+ years |

   c. Washoe County Capital Improvements Program project?

| | |
|---|---|
| ❑ Yes | ☑ No |

   d. If a public facility is proposed and is currently not listed in the Washoe County Capital Improvements Program and not available, please describe the funding mechanism for ensuring availability of water service:

| |
|---|
| Not applicable. |

10. What is the nature and timing of sewer services necessary to accommodate the proposed amendment?

   a. System Type:

| | | |
|---|---|---|
| ❑ Individual septic | | |
| ☑ Public system | Provider: | Washoe County |

   b. Available:

| | | | |
|---|---|---|---|
| ☑ Now | ❑ 1-3 years | ❑ 3-5 years | ❑ 5+ years |

   c. Washoe County Capital Improvements Program project?

| | |
|---|---|
| ❑ Yes | ☑ No |

d. If a public facility is proposed and is currently not listed in the Washoe County Capital Improvements Program and not available, please describe the funding mechanism for ensuring availability of sewer service. If a private system is proposed, please describe the system and the recommended location(s) for the proposed facility.

| |
|---|
| Not applicable. |

11. Please identify the street names and highways near the proposed amendment that will carry traffic to the regional freeway system.

| |
|---|
| Calle de la Plata and State Route 445 (Pyramid Highway). Please refer to attached traffic impact study. |

12. Will the proposed amendment impact existing or planned transportation systems? (If yes, a traffic report will be required. See attached Traffic Impact Report Guidelines.)

| | |
|---|---|
| ☑ Yes | ☐ No |

13. Community Services (provided and nearest facility):

| | |
|---|---|
| a. Fire Station | Truckee Meadowsd Fire Protection District - Spanish Springs Station |
| b. Health Care Facility | Renown or St. Mary's Urgent Care - Spanish Springs (Los Altos Pkwy.) |
| c. Elementary School | Spanish Springs Elementary School |
| d. Middle School | Yvonne Shaw Middle School |
| e. High School | Spanish Springs High School |
| f. Parks | Lazy 5 Regional Park, Eagle Canyon Park |
| g. Library | Washoe County Library - Spanish Springs Branch |
| h. Citifare Bus Stop | Pyramid Higway @ Queen Way |

14. Describe how the proposed amendment fosters, promotes or complies with the policies of the adopted area plans and elements of the Washoe County Master Plan:

a. Population Element:

A detailed analysis of the Washoe County Master Plan is included in the attached report. Specifcially, the project supports and/or implements Goal 3 of the Population Element as described in the attached report.

b. Conservation Element:

The project supports 4 polices and 3 goals of the Conservation Element. These are listed and fully addressed in the attached report.

c. Housing Element:

The request supports policy 1.5 and program 1.5 of the Housing Element as described in detail in the attached report.

d. Land Use and Transportation Element:

A detailed analysis of the Land Use and Transportation Element is included in the attached report and includes numerous policies and goals.

e. Public Services and Facilities Element:

The attached report includes a section titled "Planning Policy Analysis" in which specific policies from the Public Services and Facilities Element are addressed.

f. Adopted area plan(s):

A highly detailed analysis of the Spanish Springs Area Plan is included in the attached report.

15. If the area plan includes a Plan Maintenance component, address all policies and attach all studies and analysis required by the Plan Maintenance criteria.

The applicable findings included in the Plan Maintenance section of the Spanish Spanish Springs Area Plan are addressed in detail in the attached report.

## Applicant Comments

This page can be used by the applicant to support the master plan amendment request and should address, at a minimum, how one or more of the findings for an amendment are satisfied. (Please referrer to Article 820 of the Washoe County Development Code for the list of Findings.)

Please refer to the attached report for a highly detailed description and analysis of the proposed Master Plan Amendment, including analysis of the Spanish Springs Area Plan, Washoe County Master Plan and Truckee Meadows Regional Plan. The report also includes a detailed project description and supporting exhibits.

# Community Services Department
# Planning and Development
# REGULATORY ZONE AMENDMENT APPLICATION

Community Services Department
Planning and Development
1001 E Ninth St., Bldg A.
Reno, NV 89520

Telephone: 775.328.3600

# Regulatory Zone Amendment
# Supplemental Information

(All required information may be separately attached)

Chapter 110 of the Washoe County Code is commonly known as the Development Code. Specific references to Regulatory Zone amendments may be found in Article 821, Amendment of Regulatory Zone.

Please complete this questionnaire to ensure consistent review of your request to amend the Washoe County Zoning Map. Please provide a brief explanation to all questions answered in the affirmative.

1. Please describe the Regulatory Zone amendment request:

This application requests that the subject site (58.49+/- acres) be rezoned from a mix of Low Density Suburban (LDS), Industrial (I), and Neighborhood Commercial (NC) to Medium Density Suburban (MDS). Please refer to attached report for a detailed description.

2. List the Following information regarding the property subject to the Regulatory Zone Amendment.

   a. What is the location (address, assessor's parcel number or distance and direction from nearest intersection)?

The Washoe County Assessor lists the site address as 350 Calle de la Plata.

b. Please list the following (attach additional sheet if necessary):

| APN of Parcel | Master Plan Designation | Current Zoning | Existing Acres | Proposed Zoning | Proposed Acres |
|---|---|---|---|---|---|
| 534-571-01 | SR, I , Comm. | LDS, I, NC | 58.49 | MDS | 58.49 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

c. What are the regulatory zone designations of adjacent parcels?

| | Zoning | Use (residential, vacant, commercial, etc,) |
|---|---|---|
| North | LDS | Single Family |
| South | OS | Storm Water Detention Facility |
| East | NC and I | Vacant |
| West | NC, GR, HDR, LDS | Single Family and Vacant |

3. Describe the existing conditions and uses located at the site or in the vicinity (i.e. vacant land, roadways, easements, buildings, etc.):

The project site is vacant and undeveloped. Refer to attached report for a detailed description and exhibits depicting existing onsite conditions.

4. Describe the natural resources associated with the site under consideration. Your description should include resource characteristics such as water bodies, vegetation, topography, minerals, soils and wildlife habitat.

The site is generally flat and does not contain water bodies, cultural or historical resources, wildlife habitats, etc. and is vegetated with natural plant materials. Refer to attached report for a detailed description and site photos.

5. Does the property contain development constraints such as floodplain or floodways, wetlands, slopes or hillsides in excess of 15%, geologic hazards such as active faults, significant hydrologic resources or major drainages or prime farmland?

| ❑ Yes | ■ No |
|---|---|

Explanation:

6. Please describe whether any archaeological, historic, cultural, or scenic resources are in the vicinity or associated with the proposed amendment:

| ❑ Yes | ■ No |
|---|---|

Explanation:

7. Do you own sufficient water rights to accommodate the proposed amendment? (Amendment requests in some groundwater hydrographic basins [e.g. Cold Springs, Warm Springs, etc.] require proof of water rights be submitted with applications. Please provide copies of all water rights documents, including chain of title to the original water right holder.)

| ❑ Yes | ❑ No |
|---|---|

If yes, please identify the following quantities and documentation numbers relative to the water rights:

| | | | |
|---|---|---|---|
| a. Permit # | | acre-feet per year | |
| b. Certificate # | | acre-feet per year | |
| c. Surface Claim # | | acre-feet per year | |
| d. Other # | | acre-feet per year | |

e. Title of those rights (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources):

Information on water rights will be provided with a forthcoming tentative map. Refer to attached report for additional details.

f. If the proposed amendment involves an intensification of land use, please identify how sufficient water rights will be available to serve the additional development.

The zone change represents a de-intensification in land use. Refer to attached report for additional details.

8. Please describe the source and timing of the water facilities necessary to serve the amendment:

   a. System Type:

| | | |
|---|---|---|
| ❑ Individual wells | | |
| ❑ Private water | Provider: | |
| ■ Public water | Provider: | Truckee Meadows Water Authority |

   b. Available:

| | | | |
|---|---|---|---|
| ■ Now | ❑ 1-3 years | ❑ 3-5 years | ❑ 5+ years |

   c. Is this part of a Washoe County Capital Improvements Program project?

| | |
|---|---|
| ❑ Yes | ■ No |

   d. If a public facility is proposed and is currently not listed in the Washoe County Capital Improvements Program and not available, please describe the funding mechanism for ensuring availability of water service:

| |
|---|
| |

9. What is the nature and timing of sewer services necessary to accommodate the proposed amendment?

   a. System Type:

| | | |
|---|---|---|
| ❑ Individual septic | | |
| ■ Public system | Provider: | Washoe County |

   b. Available:

| | | | |
|---|---|---|---|
| ■ Now | ❑ 1-3 years | ❑ 3-5 years | ❑ 5+ years |

   c. Is this part of a Washoe County Capital Improvements Program project?

| | |
|---|---|
| ❑ Yes | ■ No |

d. If a public facility is proposed and is currently not listed in the Washoe County Capital Improvements Program and not available, please describe the funding mechanism for ensuring availability of sewer service. If a private system is proposed, please describe the system and the recommended location(s) for the proposed facility.

| |
|---|
| Not applicable. |

10. Please identify the street names and highways near the proposed amendment that will carry traffic to the regional freeway system.

| |
|---|
| Calle de la Plata and State Route 445 (Pyramid Highway). Refer to attached traffic impact study for in depth details. |

11. Will the proposed amendment impact existing or planned transportation systems? (If yes, a traffic report will be required. See attached Traffic Impact Report Guidelines.)

| | |
|---|---|
| ■ Yes | ❑ No |

12. Community Services (provided and nearest facility):

| | |
|---|---|
| a. Fire Station | Truckee Meadows Fire Protection District - Spanish Springs Station |
| b. Health Care Facility | Renown or St. Mary's Urgent Care - Los Altos Pkwy. |
| c. Elementary School | Spanish Springs |
| d. Middle School | Shaw |
| e. High School | Spanish Springs |
| f. Parks | Lazy 5 Regional Park, Eagle Canyon Park |
| g. Library | Washoe County - Spanish Springs Branch |
| h. Citifare Bus Stop | Pyramid Highway @ Queen Way |

## Projects of Regional Significance Information – for Regulatory Zone Amendments

Nevada Revised Statutes 278.026 defines "Projects of Regional Significance." Regulatory Zone amendment requests for properties within the jurisdiction of the Truckee Meadows Regional Planning Commission (TMRPC) must respond to the following questions. A "Yes" answer to any of the following questions may result in the application being referred first to the Truckee Meadows Regional Planning Agency for submission as a project of regional significance. Applicants should consult with County or Regional Planning staff if uncertain about the meaning or applicability of these questions.

1. Will the full development potential of the Regulatory Zone amendment increase employment by not less than 938 employees?

| | |
|---|---|
| ❑ Yes | ■ No |

2. Will the full development potential of the Regulatory Zone amendment increase housing by 625 or more units?

| | |
|---|---|
| ❑ Yes | ■ No |

3. Will the full development potential of the Regulatory Zone amendment increase hotel accommodations by 625 or more rooms?

| | |
|---|---|
| ❑ Yes | ■ No |

4. Will the full development potential of the Regulatory Zone amendment increase sewage by 187,500 gallons or more per day?

| | |
|---|---|
| ❑ Yes | ■ No |

5. Will the full development potential of the Regulatory Zone amendment increase water usage by 625 acre-feet or more per year?

| | |
|---|---|
| ❑ Yes | ■ No |

6. Will the full development potential of the Regulatory Zone amendment increase traffic by 6,250 or more average daily trips?

| | |
|---|---|
| ❑ Yes | ■ No |

7. Will the full development potential of the Regulatory Zone amendment increase the student population from kindergarten to 12$^{th}$ grade by 325 students or more?

| | |
|---|---|
| ❑ Yes | ■ No |

## Applicant Comments

This page can be used by the applicant to support the regulatory zone amendment request and should address, at a minimum, how one or more of the findings for an amendment are satisfied. (Please referrer to Article 821 of the Washoe County Development Code for the list of Findings.)

Please refer to the attached report for a detailed project description, impact analysis, and analysis of applicable Washoe County policies and findings.

Washoe County Treasurer
P.O. Box 30039, Reno, NV 89520-3039
ph: (775) 328-2510 fax: (775) 328-2500

**Washoe County Treasurer**
**Tammi Davis**

# Account Detail

Back to Search Results | Change of Address | Print this Page

## Washoe County Parcel Information

| Parcel ID | Status | Last Update |
|---|---|---|
| 53457101 | Active | 9/12/2015 2:11:46 AM |

**Current Owner:**
JACIE LLC
C/O DOUGLASS PROPERTIES LLC
3820 LONE TREE LN
RENO, NV 89511

**SITUS:**
350 CALLE DE LA PLATA
WCTY NV

**Taxing District**
4000

**Geo CD:**

Legal Description

Section 23 Lot 23 1 0 1 SubdivisionName _UNSPECIFIED Township 21 Range 20

## Tax Bill (Click on desired tax year for due dates and further details)

| Tax Year | Net Tax | Total Paid | Penalty/Fees | Interest | Balance Due |
|---|---|---|---|---|---|
| 2015 | $680.44 | $680.44 | $0.00 | $0.00 | $0.00 |
| 2014 | $680.46 | $680.46 | $0.00 | $0.00 | $0.00 |
| 2013 | $680.44 | $680.44 | $0.00 | $0.00 | $0.00 |
| 2012 | $850.58 | $850.58 | $0.00 | $0.00 | $0.00 |
| 2011 | $899.14 | $899.14 | $0.00 | $0.00 | $0.00 |
| | | | | Total | $0.00 |

### Pay Online

No payment due for this account.

$0.00

Pay By Check

**AMOUNT ABOVE WILL POPULATE AFTER PAYMENT TYPE IS SELECTED**

Please make checks payable to:
**WASHOE COUNTY TREASURER**

**Mailing Address:**
P.O. Box 30039
Reno, NV 89520-3039

**Overnight Address:**
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845

Payment Information

Special Assessment District

Installment Date Information

Assessment Information

### Important Payment Information

- ALERTS: If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a service fee does apply for online credit card payments. See Payment Information for details.

# TRAFFIC IMPACT STUDY

# FOR

# SPANISH SPRINGS AT CALLE DE LA PLATA (LOTS 1-175)

Single Family Residential Development located in the Spanish Springs Planned Area situated in Section 23, Township 21 North, Range 20 East, Washoe County Nevada

APN #534-571-01
350 Calle de la Plata

**STAR Consulting**

439 W. Plumb Lane Reno, NV 89509
Phone: (775) 352-4200 Email: erin@starconsultingnv.com

# TRAFFIC IMPACT STUDY

# FOR

# SPANISH SPRINGS AT CALLE DE LA PLATA (LOTS 1-186)

Single Family Residential Development located in the Spanish Springs Planned Area situated in Section 23, Township 21 North, Range 20 East, Washoe County Nevada

APN #534-571-01
350 Calle de la Plata

*Prepared for:*

**Blackstone Development Group**
333 N. Wilmot Road, Suite 340
Tucson, AZ 85711
(520) 618-5378

*Prepared by:*

**STAR Consulting**
439 W. Plumb Lane
Reno, NV 89509

**SUBMITTED:**
**September 15, 2015**

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## LIST OF FIGURES AND TABLES

## LIST OF APPENDICES

# I. EXECUTIVE SUMMARY

This study evaluates the potential traffic impacts of the proposed residential subdivision Master Plan Amendments, Zoning Amendment and Tentative Map in northern Spanish Springs on the nearby roadway system.

**PROJECT DESCRIPTION**

The subject property is located on the northeast quadrant of the Calle de la Plata and Pyramid Highway intersection in Washoe County, Nevada. The proposed zoning is for residential development of a density of 3.0 dwelling units per acre.

**PROJECT ACCESS**

One primary entrance is proposed to serve the subdivision and is to be located on Calle de la Plata. Direct access to Pyramid Highway is under discussion with the adjacent land owners, but is not proposed at this time. A secondary emergency access is proposed on Calle de la Plata via a cross-access agreement with the property to the east of the subject property.

**STUDY INTERSETIONS AND SCENARIOS**

The following study intersections were analyzed, consistent with previous studies of the site:

- Calle de la Plata / Pyramid Highway
- Calle de la Plata / Project Primary Access

AM and PM weekday peak hour intersection level of service was analyzed for the following conditions:

- Existing Conditions
- 2016 Background Conditions
- 2016 Background plus Project

Daily roadway segment level of service was analyzed for the following conditions:

- Existing Conditions
- 2016 Background Conditions
- 2016 Background plus Project

**EXISTING CONDITIONS**

AM and PM weekday peak hour intersection turning movement volumes were collected and used to analyze intersection level of service. The Calle de la Plata/Pyramid Highway intersection currently operates at LOS F during the AM and PM peak hours.

**PROJECT CONDITIONS**

The estimated trip generation for the proposed development is 1,675 daily, 131 AM peak hour, and 177 PM peak hour vehicle trips. Internal capture and pass-by reductions are not applicable to the proposed use and have therefore been excluded in the trip generation estimate.

**EXISTING PLUS PROJECT CONDITIONS**

The Calle de la Plata / Pyramid Highway intersection operates at LOS F under existing plus project conditions without planned regional roadway improvements. The Calle de la Plata / Primary Access intersection will operate at acceptable levels of service with side-street stop controls.

**REGIONAL IMPROVEMENTS**

The following planned regional roadway improvements are listed in the RTP:

- Pyramid Highway – Widen from two lanes to four lanes, from Sunset Springs Lane to Calle de la Plata

The Spanish Springs Area Plan also recommends a traffic signal at the Calle de la Plata / Pyramid Highway intersection.

With the planned regional roadway improvements, the Calle de la Plata / Pyramid Highway intersection is expected to operate at LOS C and D during the AM and PM peak hours, respectively.

The Pyramid Highway and Calle de la Plata daily traffic volumes near the project site were compared to the Regional Transportation Commission's (RTC) daily level of service thresholds. The roadway segments will operate at LOS D or better with the planned roadway improvements.

The RTP avoids recommending specific intersection improvements, recognizing that the specific intersection configurations should be determined at the time when the corridor is improved and actual turning movements are known. The RTP project listed above assumes that intersection upgrades will be accomplished with the widenings.

## A. Purpose of Report and Study Objectives

In order for Washoe County to operate and maintain the roadway network as safely and efficiently as possible, it is necessary to evaluate the impact of development generated traffic. Such impact can be identified by conducting a Traffic Impact Study (TIS). A Traffic Impact Study was completed by Fehr and Peers in August of 2009 at the time of the Zoning Amendment application for what was at that time called Village at the Peak. This study focuses on the impacts of a larger area consisting of single family residential, neighborhood commercial and industrial land uses. **The proposed use of 3.0 residents per acre single-family residential is a <u>decrease</u> from the projected traffic from the current zoning.**

### *1. Washoe County*

A traffic impact report is required whenever the proposed development project will generate 80 or more weekday peak hour trips as determined using the latest edition Institute of Transportation

Engineers (ITE) trip generation rates or other such sources as may be accepted by the Washoe County Engineering. Projects with less than 200 peak hour trips may not need to perform an impact analysis for future years.

**The proposed development will generate 177 PM peak hour trips. Due to this estimate of peak hour trips, a Traffic Impact Report is required for the proposed development. Impact analysis for future years is not required by Washoe County.**

### *2. NEVADA DEPARTMENT OF TRANSPORTATION*

Traffic studies are required by the Department to adequately assess the impact of a proposed development on the existing and/or planned highway system. The developer will have the primary responsibility for assessing the traffic impacts associated with a proposed development, with the Department serving in a review and approval capacity. The traffic study will be the responsibility of the applicant and must be prepared and sealed by a Nevada Licensed Engineer who has expertise in traffic studies and transportation planning. Upon receipt of a draft traffic study the NDOT Traffic Engineering Division will review the study data (sources, methods and findings) and will respond with written comments. The developer and engineer will then have an opportunity to incorporate necessary revisions prior to submitting a final report. The NDOT Traffic Engineering Division then must approve the final report before an application will be accepted. All previous traffic studies that are more than two (2) years old at the time that construction commences on the project will require updating. This may be waived if conditions have not significantly changed.

More specifically, traffic studies will be required for the for residential subdivision developments that, although not directly accessing the Department's rights-of-way or highway, will have significant impact to the traffic on an existing highway.

**Because this development will immediately access Pyramid Highway after exiting onto Calle de la Plata, this report will be provided to NDOT for a cursory review.**

## B. CONCLUSIONS & RECOMMENDATIONS

1: This project will generate
   131 morning peak hour trips
   177 evening peak hour trips
   1,675 average weekday trips
2: The number of trips generated by the proposed residential use is a decrease from the number of trips proposed with the current mixed use zoning. The proposed residential use is only 58% of the currently zoned uses (2,888 trips).
3: This analysis demonstrates adequate regional roadway improvements are planned to accommodate regional growth. Acceleration of the planned improvements is a viable option since regional projects are re-evaluated and prioritized every two years.
4: Although intersection improvements are planned by the RTC, the installation of a left turn lane at the Calle de la Plata / Pyramid Intersection should be considered with this development.
5: The proposed development will have no negative impact on the surrounding road network or intersections.
6: The proposed development will have no measureable impact on the level of service of the adjacent segments or intersections, when regional improvements (traffic signal at Calle de la Plata) are completed.
7: The adjacent roadways are currently operating under capacity.
8: When the new driveway is constructed, it is further recommended that curb access ramps be installed and care be taken to insure ADA slopes to match the existing sidewalk are maintained.
9: The project intersections must be designed to provide adequate sight distances, in conformance with Wahoe County standards.
10: All signs and pavement markings associated with the development must conform to the MUTCD or Washoe County requirements.

## C. CONFORMANCE WITH SPANISH SPRINGS VISION AND CHARACTER STATEMENT

Policy SS.17.2 of the Spanish Springs Area Plan requires compliance with several traffic related criteria. Our response based on the traffic analysis follows the text for each specific item.

b. A traffic analysis has been conducted that clearly identifies the impacts to the adopted level of service with the (unincorporated) Spanish Springs Hydrographic Basin and the improvements likely to be required to maintain/achieve the adopted level of service. This finding may be waived by the Department of Public Works for projects that are determined to have minimal impacts. The Department of Public Works may request any information it deems necessary to make this determination.

***RESPONSE: This study demonstrates that acceptable levels of service can be maintained on the regional roadway system.***

e. If the proposed intensification will results in a drop below the established policy level of service for transportation (as established by the Regional Transportation Commission and Washoe County) within the Spanish Springs Hydrographic Basin, the necessary improvements required to maintain the established level of service are scheduled in either the Washoe County Capital Improvements Program or Regional Transportation Improvement Program within three years of approval of the intensification. For impacts to regional roads, this finding may be waived by the Washoe County Planning Commission upon written request from the Regional Transportation Commission.

***REPONSE: This study discusses the potential impacts and timing of improvements outlined in the RTC plan as well as developer financed improvements.***

f. If roadways impacted by the proposed intensification are currently operating below adopted levels of service, the intensification will not require infrastructure improvements beyond those articulated in the Washoe County and Regional transportation plans AND the necessary improvements are scheduled in either Washoe County Capital Improvements Program or Regional Transportation Improvement Program within three years of approval of the intensification.

***RESPONSE: The improvements necessary to accommodate regional traffic flows and this project can be timed appropriately to avoid adverse traffic impacts.***

# II. INTRODUCTION

## A. SITE AND STUDY AREA BOUNDARIES

The proposed development is located on approximately 58.5 acres in the Spanish Springs Planned area within Washoe County. The project address is 350 Calle de la Plata. The parcel number is 534-571-01 and is situated in Section 23 of Township 21, Range 20. The existing topography is gently sloping in uniform slope toward the northwest.

The project is within the jurisdictional boundaries of Washoe County, in Spanish Springs. The proposed development is located just east of, but does not abut, State Road 445 (Pyramid Highway) and north of Calle de la Plata. The existing site is undeveloped and bordered by residential to the north and east as well as undeveloped areas and commercial uses to the west.

The existing zoning is neighborhood commercial (NC), industrial (I) and suburban residential (SR). **This report is being prepared in conjunction with a Master Plan Amendment Application, a Rezoning Application and a Tentative Map Application.** The proposed zoning is residential with a development density of 3.0 dwelling units per acre.

There are several existing roads and driveways in the vicinity of the subject parcel. State Road 445 (Pyramid Highway) is located west of the subject property. Calle de la Plata will serve as the primary access for the development. The existing road, Dykes Court, is located south of Calle de la Plata and is in the alignment of the proposed primary access point to the development. Direct access to Pyramid Highway is not proposed at this time but is being discussed as an alternative. If such access were to be pursued it would be in the alignment of and at the existing access point of Partel Road (called Sha Neva Road). The next access to Calle de la Plata is Echaniz Court, north side, located approximately 1,900 feet east of the proposed primary access point.

**The study limits for this Traffic Impact Study are limited to the proposed primary access point at Calle de la Plata and the existing intersection of Calle de la Plata and Pyramid Highway.**

An Aerial Image with existing roadways labeled is shown in Exhibit II.A for reference.

Exhibit II.A: Aerial Image and Existing Roadways


*Source: Google Earth Imagery Date 04/29/14*

## B. EXISTING AND PROPOSED SITE USES AND DENSITIES

The proposed development, as shown on the site plan, is a residential subdivision with a density of 3.0 dwelling units per acre. The average proposed lot size is 7,000 – 8,000 SF. The balance of the site is proposed as common area to serve the drainage and recreation needs of the development. The proposed on-site roadways are public roads. Due to the lot size of less than 0.5 acre, standard roadway section B as shown in the Washoe County standard drawing W-1.2 is applicable to this site. The proposed right-of-way is 42' or 52' throughout the development.

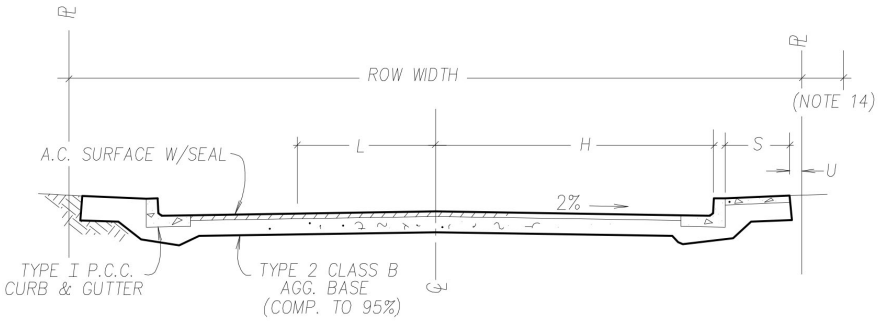
The use of a standard cul-de-sac, per Washoe County standard drawing W-7, is required at any end sections of roadway. This may be used as a temporary feature for phased development or as a permanent paved turnaround as needed for site design.

The proposed development currently has one access point from Calle de la Plata. While the access to SR 445 is under discussion, no agreement for access has been reached at the time of this report. A secondary, emergency access point may be necessary for a development of this size. The Washoe County standard drawing W-1.5 provides for a Permanent Emergency Access Road that can be used with the approval of the County Engineer. Furthermore, a cross-access agreement is under discussion with the property owner to the east. This is the recommended secondary access.

The standard drawings are shown for reference in Exhibit II.B.

SECTION 110.436.25–2: ROADWAY SECTIONS – B

GENERAL APPLICATIONS: URBAN AREAS, SUBURBAN AREAS, LOT SIZES LESS THAN 0.5 AC.




| ROW | H | S | U | L | B | PL | ADT MAX PER 2 TRAVEL LANES | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 52 | 20 | 5 | 0.5 | 12 | 4 | 0 | 7300 | COLLECTOR |
| 42 | 16 | 4 | 0.5 | 11 | 0 | 2 | 1000 | LOCAL |

NOTES

1. ALL WIDTHS ARE IN FEET.
2. H IS MEASURED TO THE FRONT FACE OF CURB.
3. L IS TRAVEL LANE; S IS SIDEWALK; B IS BICYCLE LANE; PL IS MAX. NUMBER OF PARKING LANES ALLOWED; ROW IS RIGHT OF WAY; ADT IS AVERAGE DAILY TRAFFIC.
4. ADT REPRESENTS THE DESIGN VOLUME FOR A TWO LANE FACILITY.
5. BICYCLE LANE SHALL BE PROVIDED IN ACCORDANCE W/THE BICYCLE AND PEDESTRIAN ELEMENT OF THE REGIONAL TRANSPORTATION PLAN AND TO THE SATISFACTION OF THE COUNTY ENGINEER.
6. STRUCTURAL SECTIONS SHALL BE DETERMINED BY GEOTECHNICAL ENGINEERING DESIGN BUT IN NO CASE SHALL BE LESS THAN 4" A.C. OVER 6" GRAVEL BASE FOR COLLECTOR STREETS AND 3" A.C. OVER 6" GRAVEL BASE FOR LOCAL STREETS.
7. ALL CURB AND GUTTER IS MONOLITHIC CONC. AND L SHAPED PER STANDARD DETAIL.
8. SIDEWALK AREA IS CONC. BOTH SIDES FOR COLLECTORS, ONE SIDE FOR LOCALS. ALTERNATE SIDEWALK LOCATIONS/CONFIGURATIONS MUST BE APPROVED BY THE COUNTY ENGINEER.
9. ALL A.C. SURFACES SHALL BE SEALED IN ACCORDANCE WITH WASHOE CO. STANDARDS.
10. RESIDENTIAL DRIVEWAY ACCESS NOT ALLOWED TO STREETS ON WHICH 10YR. DESIGN ADT EXCEEDS 2000.
11. DESIGN OF IMPROVEMENTS TO BE DONE IN ACCORDANCE WITH ARTICLES 420 & 436 OF WASHOE COUNTY DEVELOPMENT STANDARDS AND DESIGN GUIDELINES.
12. ALL CONSTRUCTION IS TO BE DONE TO CURRENT WASHOE CO. STANDARDS & SPECIFICATIONS.
13. SLOPE EASEMENTS MAY BE REQ'D IN CERTAIN TERRAIN TO ACCOMMODATE THE ROADWAY SECTION.
14. MIN 7.5' PUBLIC UTILITY/TRAFFIC CONTROL SIGNAGE/PLOWED SNOW EASEMENT IS REQ'D ON BOTH SIDES OF ROW.

| NO. | REVISED | DATE |
|---|---|---|
| 6 | changed adt | 12/05sw |
| 3 | Sub/Notes | 1/94vp |
| 4 | Corr "U" | 2/94/vp |
| 5 | Save As W–2.dwg | 10/01vp |

STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

ROADWAY SECTIONS (B)

GENERAL APPLICATIONS

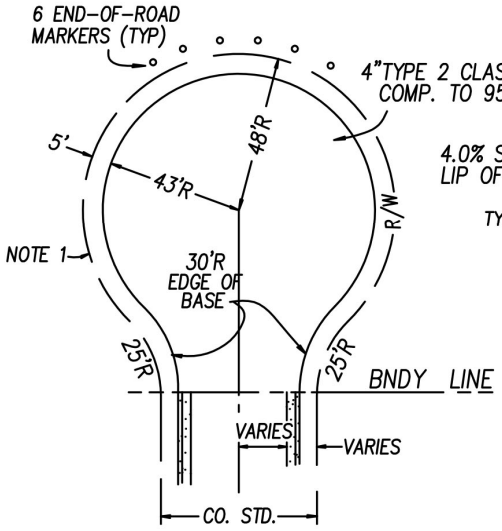
URBAN AREAS/SUBURBAN AREAS

LOT SIZE: LESS THAN 0.5 ACRE

SECTION: WASHOE

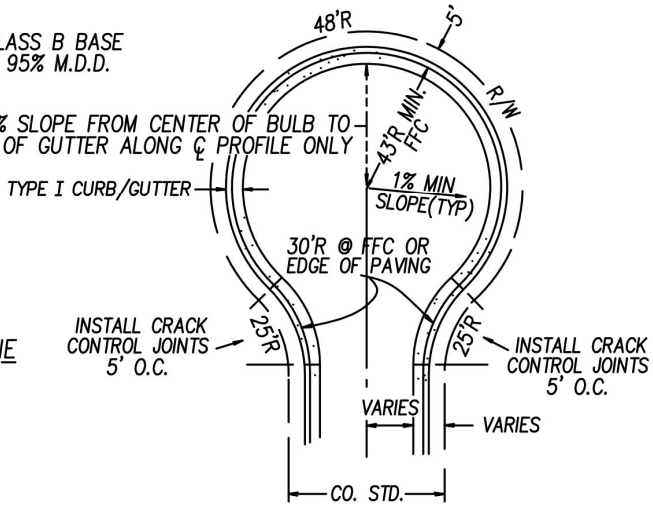
DRAWING NO: W–1.2

DATE: 2/93vp PAGE: 2



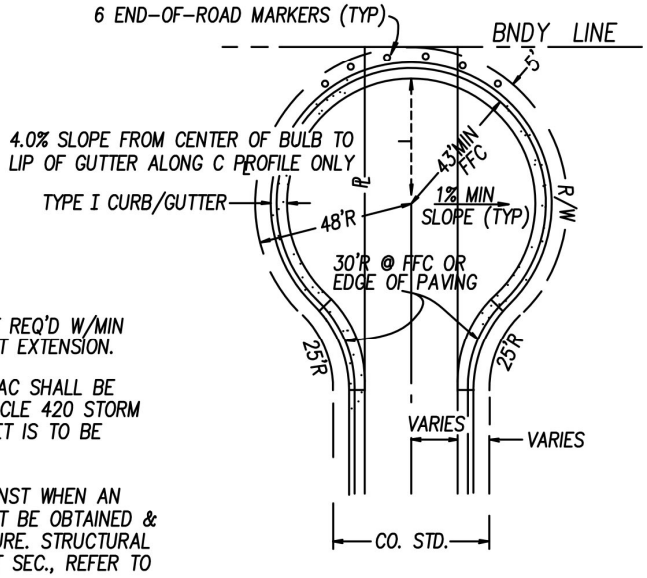

UNPAVED TEMPORARY

N.T.S.




PAVED PERMANENT

N.T.S.




PAVED TEMPORARY

N.T.S.

NOTES

1. TEMP TURNAROUND EASEMENT DOCUMENT REQ'D W/MIN 48' RADIUS TO BE ABANDONED W/STREET EXTENSION.
2. DRAINAGE OF UNPAVED TEMP CUL-DE-SAC SHALL BE CONSISTANT W/CO. STDS INCLUDING ARTICLE 420 STORM DRAINAGE & TO BE USED ONLY IF STREET IS TO BE EXTENDED WITHIN 1 YR.
3. PAVED TEMP TURNAROUND SHALL BE CONST WHEN AN OFF-SITE TEMP TURNAROUND EASE CAN'T BE OBTAINED & STREET IS TO BE EXTENDED IN THE FUTURE. STRUCTURAL SEC. OF TURNAROUND TO MATCH STREET SEC., REFER TO CODE 111.444 FOR CONSTRUCTION.
4. PAVED TEMPORARY TURNAROUND IS REQUIRED ON ALL FUTURE THROUGH-STREETS THAT FRONT LOTS, OR EXTEND MORE THAN 150 FT BEYOND THE NEAREST INTERSECTING STREET.

| NO. | REVISED | DATE |
|---|---|---|
| 1 | REDRAWN | 5/94 vp |
| 2 | 4%-NOTE 4 | 10/96 vp |
| 3 | RADII | 9/97 vp |
| 4 | Profile note | 5/99vp |

STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# CUL-DE-SAC

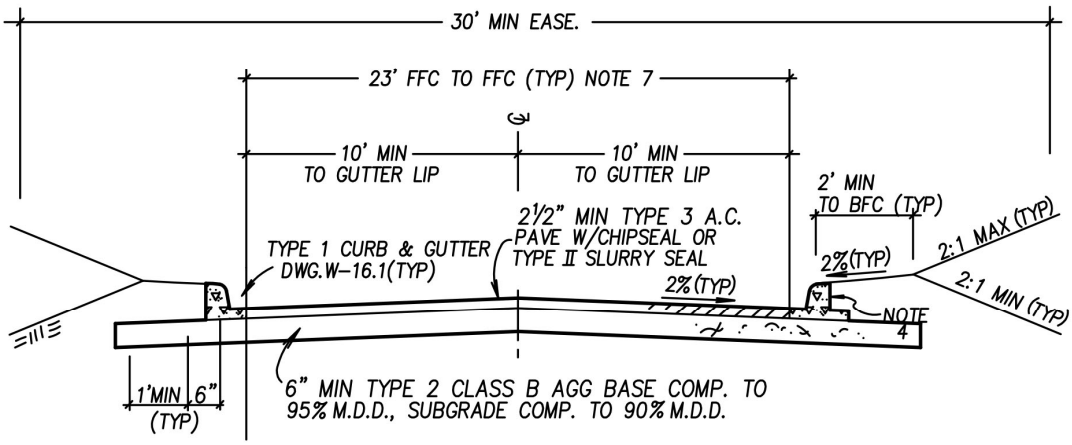
SECTION: WASHOE

DRAWING NO: W-7

DATE: 5/94 vp PAGE: 18

**STAR Consulting**

439 W. Plumb Lane Reno, NV 89509
Phone: (775) 352-4200 Email: erin@starconsultingnv.com




TYP. SECTION

N.T.S.

NOTES

1. ALL CONST SHALL CONFORM TO LATEST EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONST., THE LATEST STANDARD DETAILS & ALL OTHER APPLICABLE CODES.
2. ONE 30"x30" SIGN SHALL BE PLACED ON EACH END OF EMERGENCY ACCESS ROAD & SHALL READ "EMERGENCY VEHICLES ONLY" – "NOT A PUBLIC STREET"
3. ADDITIONAL EASEMENT MAY BE REQ'D AT INTERSECTIONS.
4. BACKFILL FOR A MIN DIST OF 2' BEHIND CURB SHALL BE COMPACTED TO 90% M.D.D. & SHALL BE EITHER TYPE 2 CLASS B BASE OR CLASS A BACKFILL.
5. ADDITIONAL EASE & ROADWAY WIDTH MAY BE REQ'D BY COUNTY ENGINEER.
6. ALL GATES & PAVEMENT WIDTHS SHALL BE TO THE SATISFACTION OF COUNTY ENGINEER & LOCAL FIRE DEPT.

| NO. | REVISION | DATE | STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION | SECTIONS WASHOE |
|---|---|---|---|---|
| 1 | REDRAWN | 7/94 vp | PERMANENT EMERGENCY ACCESS ROAD | DRAWING NO. W-1.5 |
| 2 | TYPE 1 C&G | 10/04 smw | | |
| | | | TO BE USED ONLY WITH THE APPROVAL OF THE COUNTY ENGINEER | DATE 10/04 PAGE 5 |
| | | | | |

**STAR Consulting**

439 W. Plumb Lane Reno, NV 89509
Phone: (775) 352-4200 Email: erin@starconsultingnv.com

## C. EXISTING AND PROPOSED USES IN VICINITY OF SITE

The Washoe County GIS provides access to vicinity maps which show the existing uses and zoning in the vicinity of the subject parcel.

The vicinity maps from the Washoe County GIS are shown for reference in Exhibit II.C.

Exhibit II.C.1: Washoe County GIS – Aerial Photo in Vicinity of Site

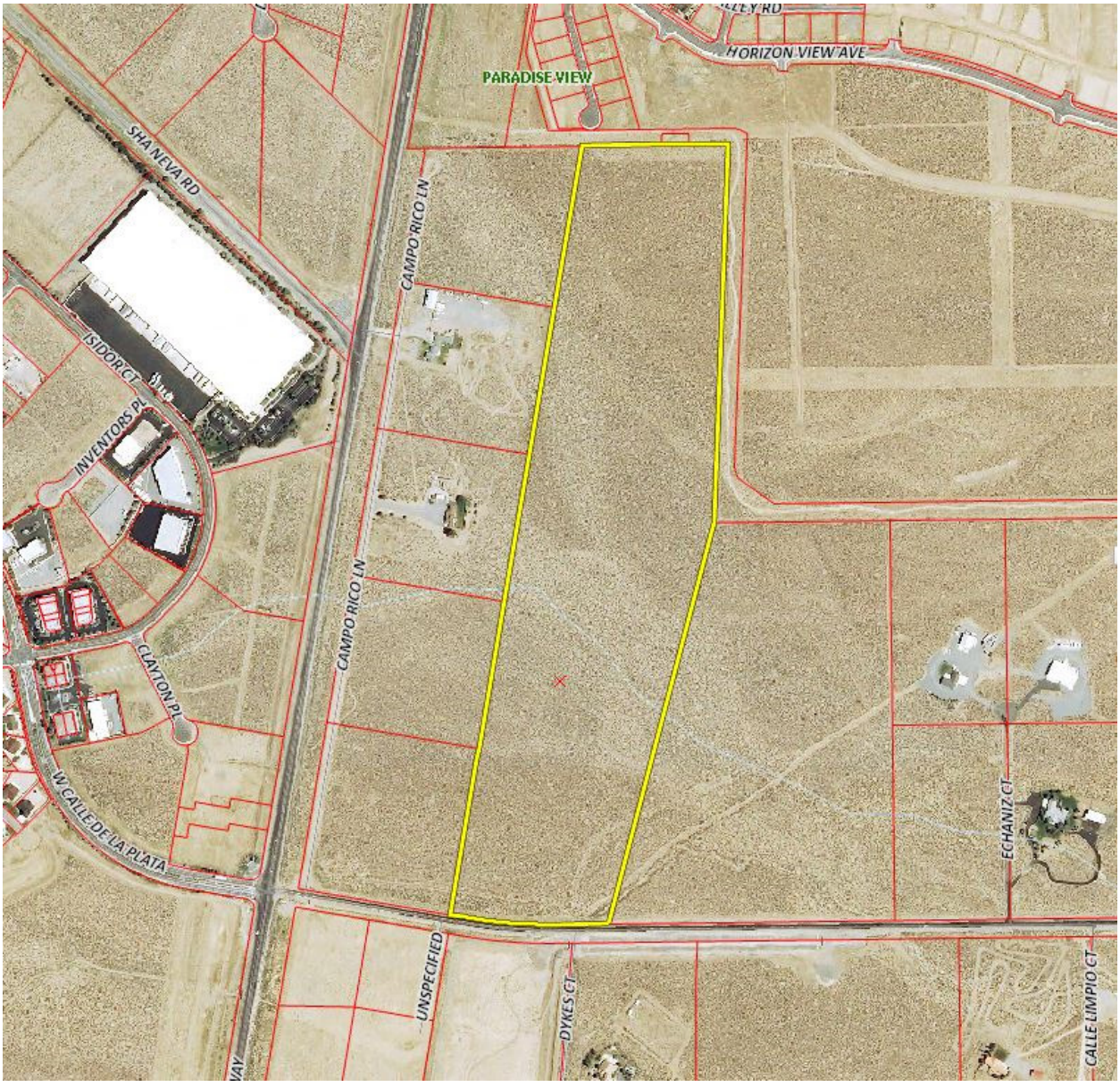


Exhibit II.C.2: Washoe County GIS – Topography in Vicinity of Site

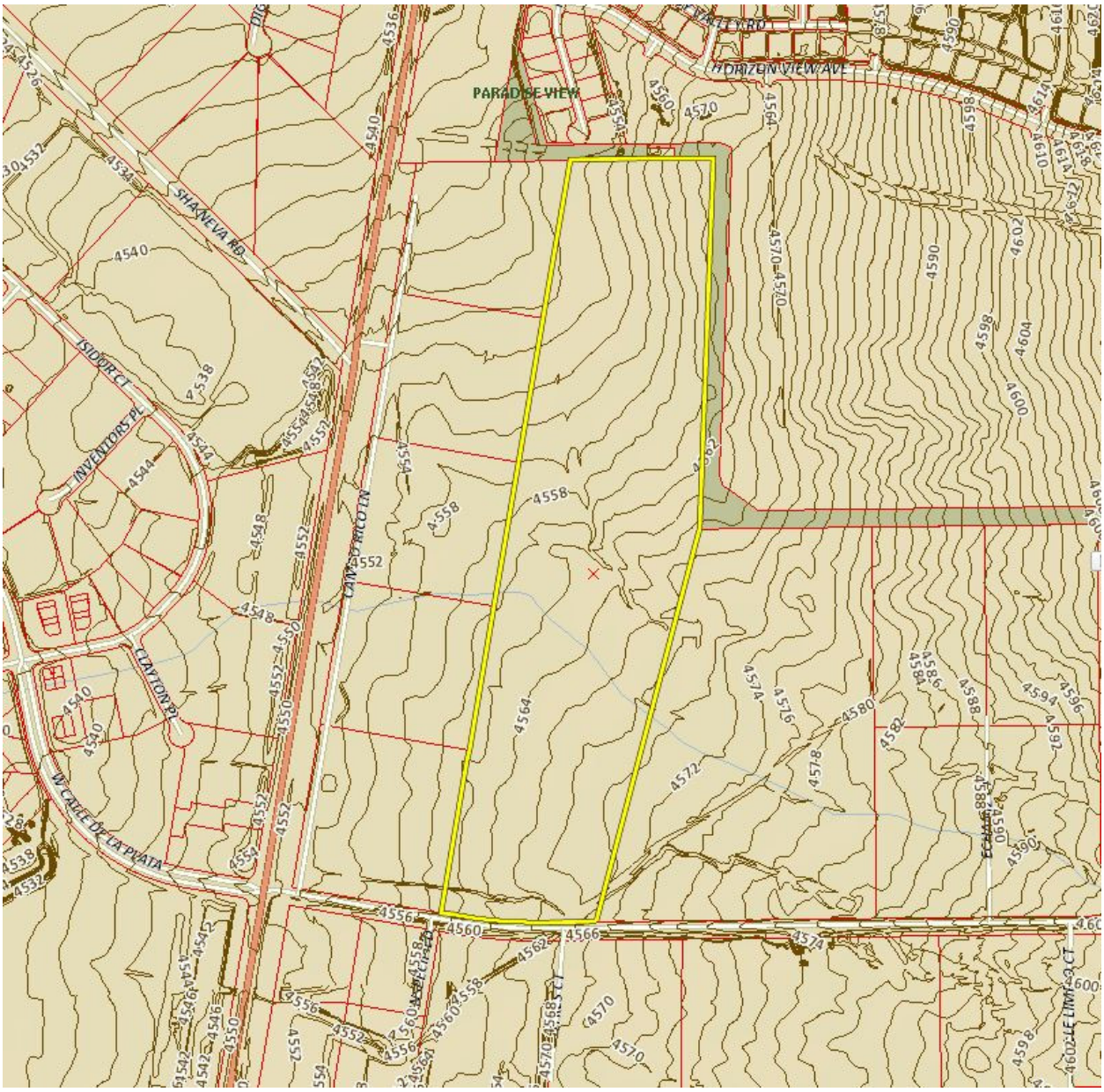


Exhibit II.C.3: Washoe County GIS – Master Plan Designation in Vicinity of Site

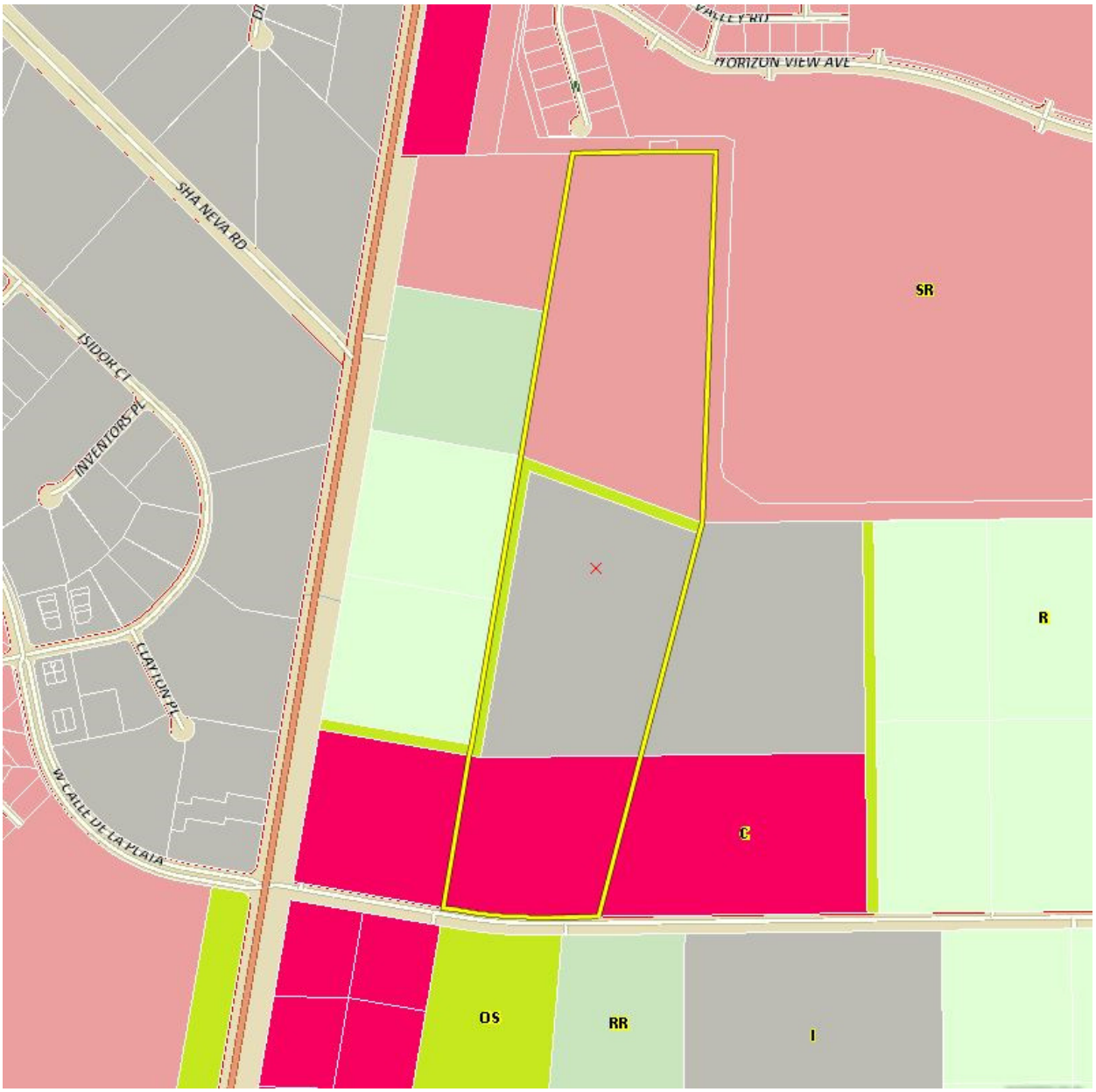
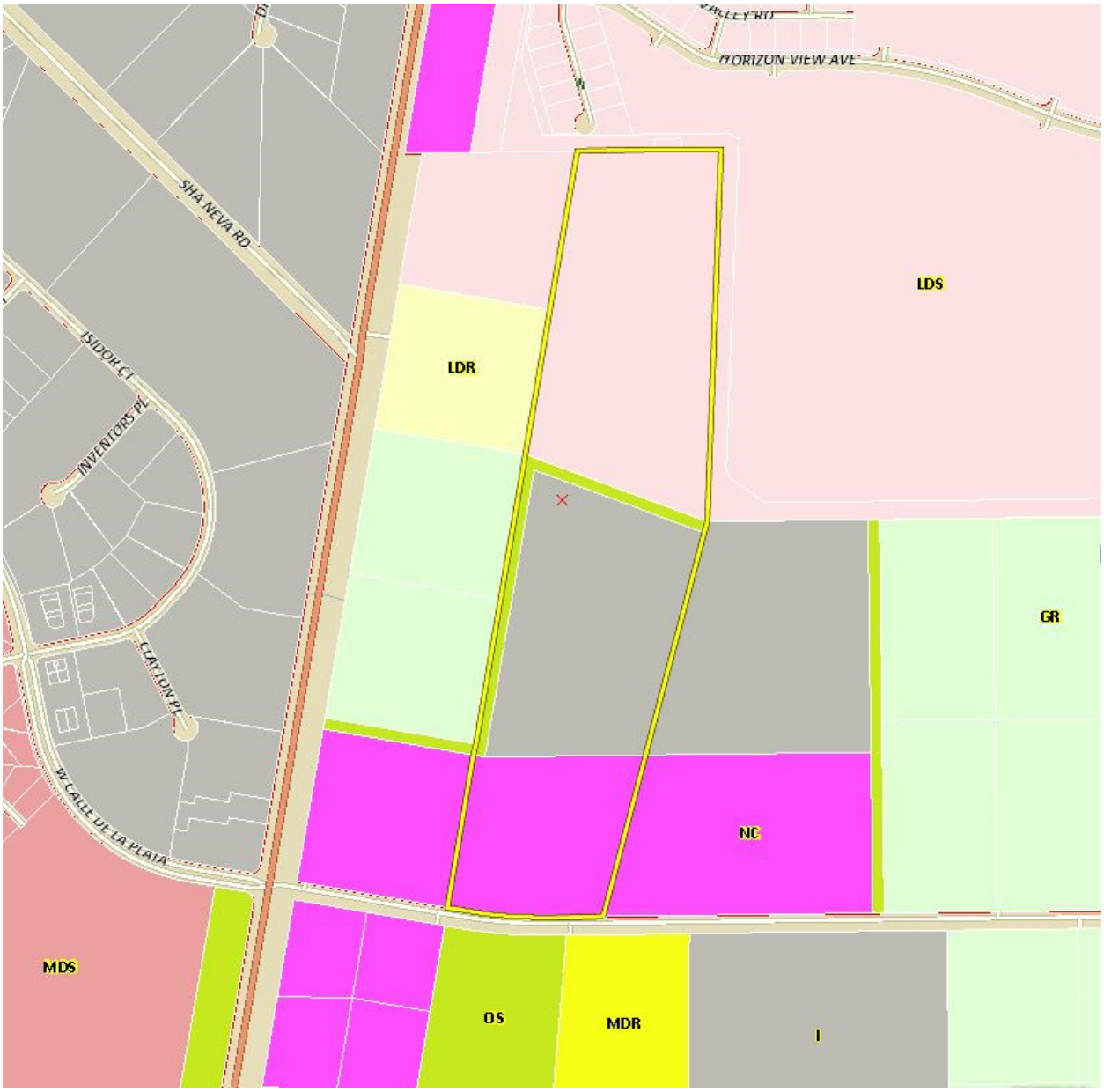


Exhibit II.C.4: Washoe County GIS – Existing Zoning in Vicinity of Site




**Trip Estimate for Current Zoning:**

Residential: 718 trips
Industrial: 972 trips
Commercial: 1,198 trips
**2,888 currently zoned daily trips**

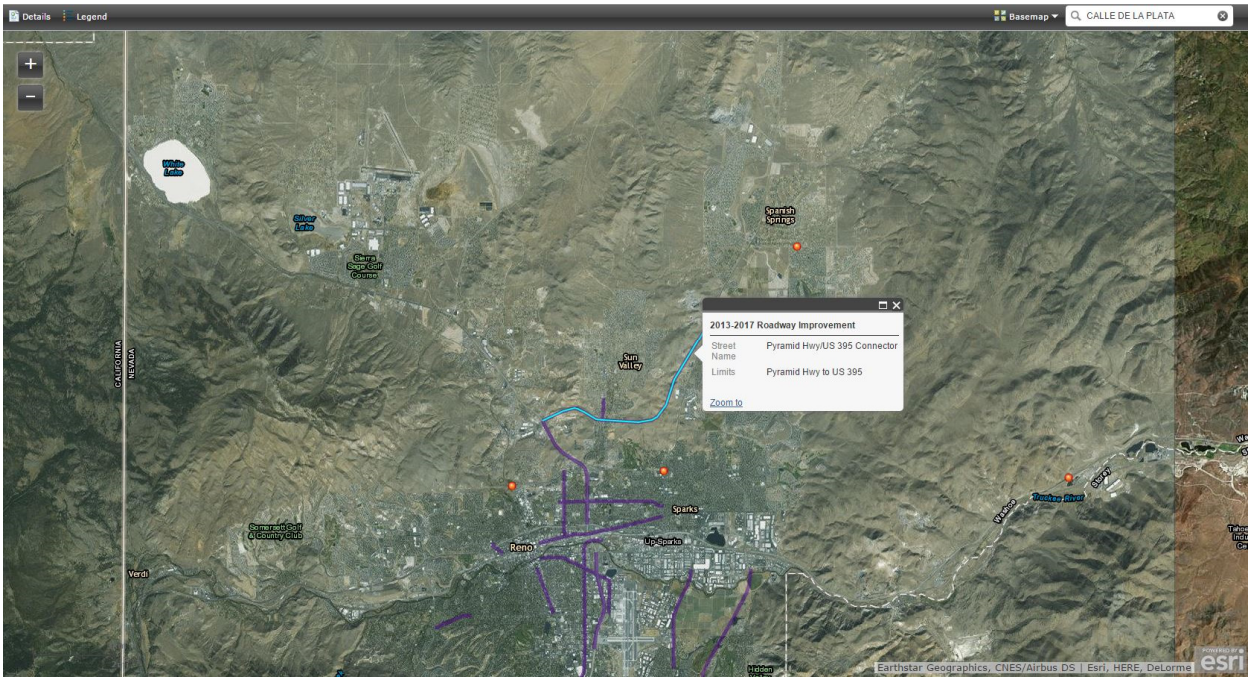
## D. Existing and Proposed Roadways and Intersections

Existing roadways, intersections, geometrics, traffic control devices and improvements proposed by governmental agencies are planned from the current year through 2035. No publicly funded capital improvement projects are planned for the project vicinity until the 2023-2035 project plans. No further details are available for the projected improvements.

The project maps are shown in Exhibit II.D.

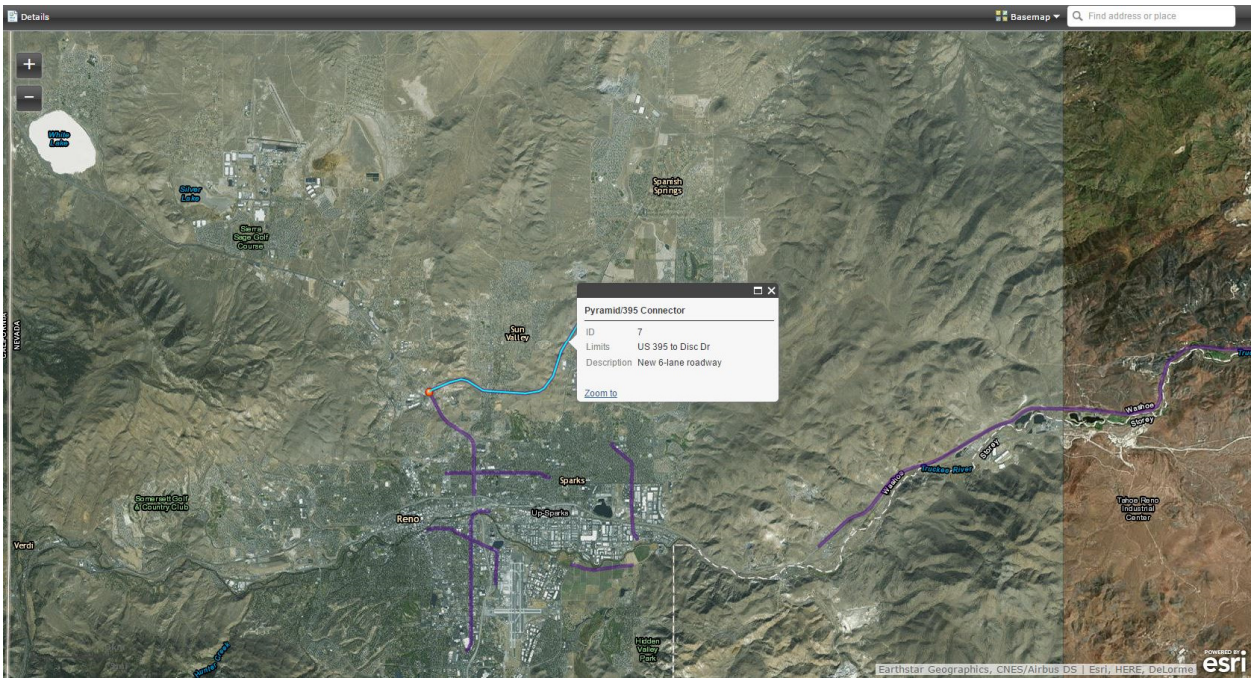
As shown in Exhibit II.D.1, the plans for Pyramid Highway for project years 2013-2017 are limited to south of US 395.

Exhibit II.D.1: Capital Improvement Project Plans 2013-2017



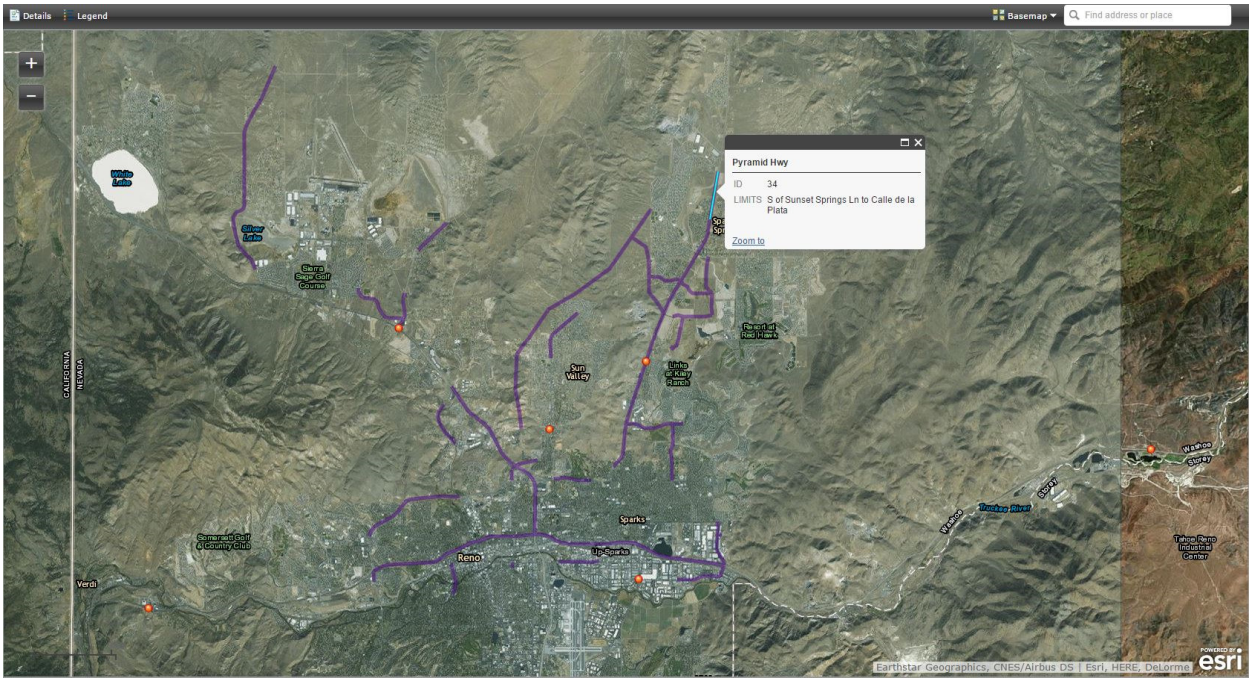
As shown in Exhibit II.D.2, the plans for Pyramid Highway for project years 2018-2022 are limited to south of US 395.

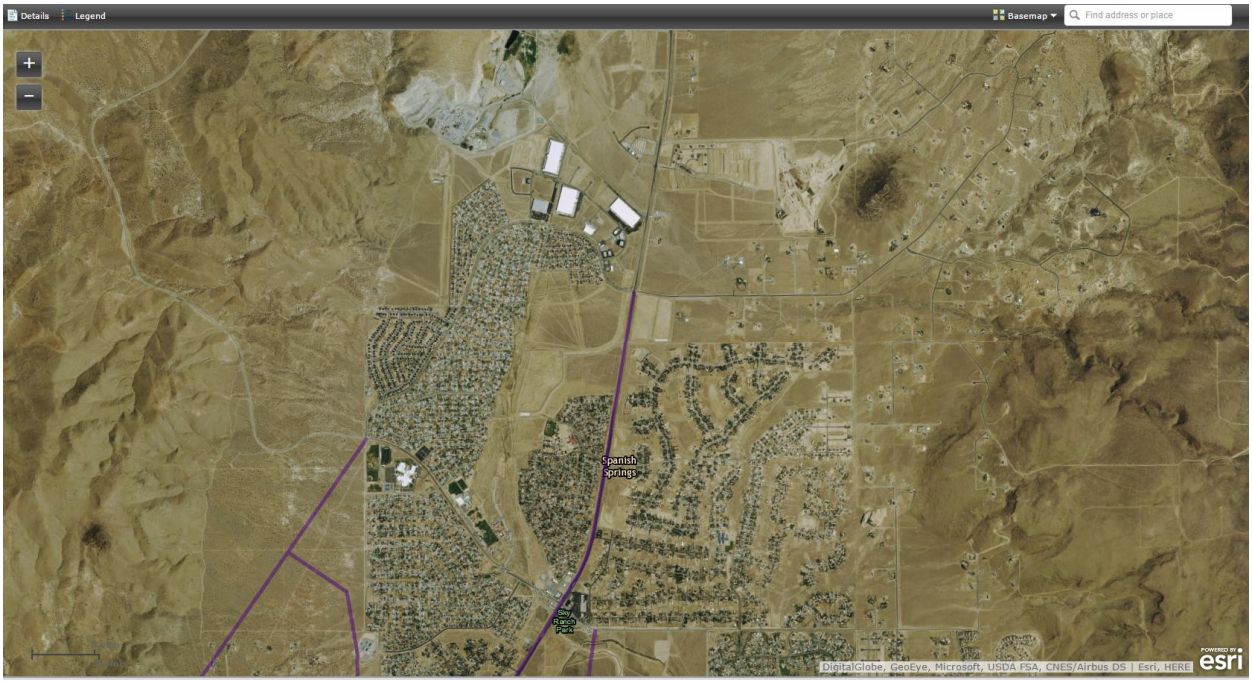
Exhibit II.D.2: Capital Improvement Project Plans 2018-2022



As shown in Exhibit II.D.3, the plans for Pyramid Highway for project years 2023-2035 include the Calle de la Plata intersection.

Exhibit II.D.3: Capital Improvement Project Plans 2023-2035



### 1. *State Road 445 (Pyramid Highway)*

Pyramid Highway is a north-south NDOT facility that runs from Interstate 80 (I-80) in the south to Pyramid Lake in the north. Pyramid Highway is a two-lane roadway with posted speed limits of 55-65 MPH in the vicinity of the subject property. The RTP classifies Pyramid Highway as a High Access Control (HAC) Arterial south of Calle de la Plata and a Moderate Access Control (MAC) Arterial north of Calle de la Plata.

| | |
|---|---|
| Existing R/W Width: | 175' |
| Future R/W Width: | 175' |
| Number of Thru Lanes: | 2 (NB & SB) |
| Turn Lanes: | RTL (MB&SB) |
| | No Acceleration or Deceleration lanes |
| Posted Speed Limit: | 55 MPH |
| AADT: | 10,500 |
| Medians: | No |
| On-street Parking: | No |
| Sidewalks: | No |
| Bike route: | No |

Nevada Department of Transportation publishes traffic volumes for State Road 445. Traffic count station 0311032 is located .375 mi north of Sunset Springs Road, south of Calle de la Plata. This station indicates a consistent traffic count from 2008 to 2013 of approximately 10,500 trips. The traffic volume data has been included in Appendix B of this study.

### 2. *Calle de la Plata*

Calle de la Plata is a four lane roadway west of Pyramid Highway and a two lane roadway east of Pyramid Highway. The RTP lists Calle de la Plata as a Low Access Control (LAC) Collector west of Pyramid Highway.

| | |
|---|---|
| Existing R/W Width: | 80' |
| Future R/W Width: | 80' |
| Number of Thru Lanes: | 2 |
| Turn Lanes: | 0 |
| Posted Speed Limit: | 40 MPH |
| AADT: | 3,900 |
| Medians: | No |
| On-street Parking: | No |
| Sidewalks: | No |
| Bike route: | No |

**TRANSIT, BICYCLE AND PEDESTRIAN FACLITIES**

No existing or planned transit routes access Pyramid Highway or Calle de la Plata in the vicinity of the project. Bike lanes and sidewalks are present on Calle de la Plata west of Pyramid Highway.

Exhibit II.D.4: Intersection Aerial and Photos


Calle de la Plata looking east, toward subject property


Calle de la Plata looking west, toward Pyramid Highway

# III. SITE PLAN REQUIREMENTS

*Provide a scaled site plan, including building locations, driveways, and internal traffic and parking areas. Identify all points of access, existing and proposed, and tie to existing highway engineering stationing. This shall include all access points both adjacent to and on the opposite side of the highway for the length of the proposed development. The site plan shall show the locations and dimensions of all proposed and existing roadway accesses, highway traffic lanes, medians, pavement striping and markings, and signs involved in the analysis and proposal. The site plan shall also show the existing and proposed facilities for pedestrian traffic. The site plan shall include provisions for service and delivery vehicle traffic generated by the site. Access points expected to be used by service vehicles shall have turning paths sufficient to allow service vehicles to enter and exit the site without encroaching upon opposing lanes, curbed areas or unpaved areas.*

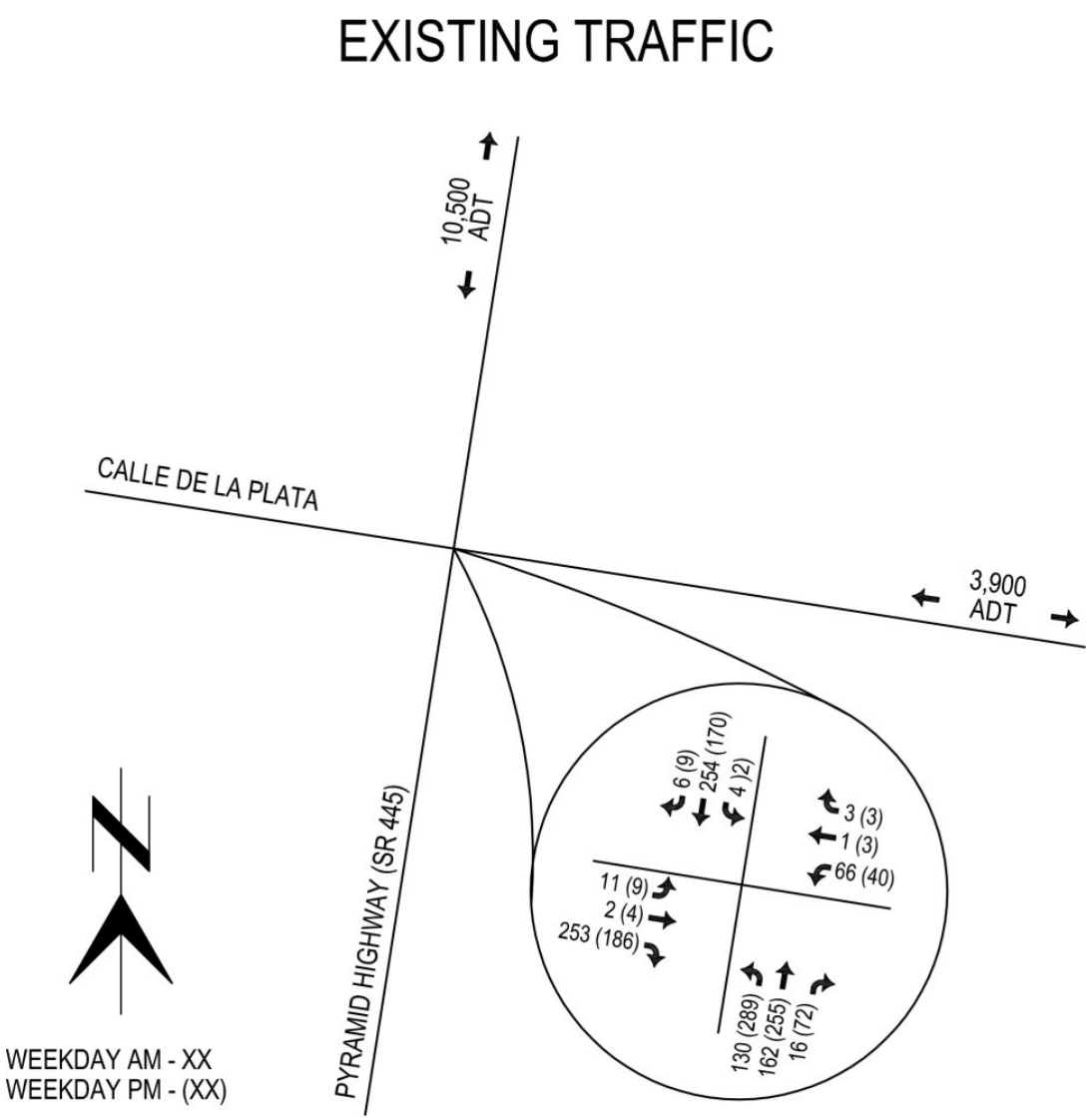
The Preliminary Site Layout is included in Appendix A of this report for reference. At the time of this report, the Map Amendment and Rezoning Application for this project is under review with Washoe County Community Development.

# IV. EXISTING TRAFFIC COUNTS

Intersection turning movement counts were collected at the Calle da la Plata/ Pyramid Highway intersection during the AM (7:00AM to 9:00AM) and PM (4:00PM to 6:00PM) peak periods in August 2008 for the previously completed analysis. Nothing significant has changed in the vicinity or collected data to indicate that new traffic counts would reflect anything different from previously reported. For that reason, the previous data has been maintained for this report. The existing volumes, shown in Exhibit IV, were used to analyze the level of service at the study intersection. Detailed intersection movement data is provided in Appendix J.

The Calle de la Plata / Pyramid Highway side street approach operates at LOS F during the AM and PM peak hours. The overall intersection is shown to operate at LOS A.

Exhibit IV: Existing Traffic



# V. TRIP GENERATION

The future traffic from the project is estimated using the trip rates contained in the Institute of Traffic Engineers' Trip Generation, 9th Edition, as well as additional studies, data and estimations. All referenced ITE material is provided in the Appendix of this report. The number of trips generated is the mathematical product of land use intensity and the trip generation rate. The result is the total number of one-way trips (not round trips) expected to be generated by the project. These trips represent the number of vehicles estimated to enter and leave the project. All of the estimates are based on the number of dwelling units (homes). The ITE land use code 210 is specific to the single-family detached residential home. The ITE estimated 9.57 ADT per dwelling unit, 1.01 PM Peak Hour trips per dwelling unit and 0.75 AM Peak Hour trips per dwelling unit.

It should be noted that the proposed action is a zoning amendment, and as this study analyzes the potential impacts results from an amendment, trip generation for the existing zoning should be subtracted to show the difference in traffic levels. However, because the existing zoning is more intense from a traffic perspective, that calculation would result in negative intersection movements. Alternatively, this analysis is showing the impact of the residential development regardless of the existing zoning and evaluating the impact of that development without a credit for the zone amendment.

Based on the above trip generation rates, the AM and PM peak trip generation is estimated as shown in Table V.1.

The average daily trips are shown in Table V.2.

Table V.1: AM and PM Peak Trip Rates and Trip Generation

| Land Use | Unit | No. Units | ITE Categ. | AM Peak Trips Per Unit | PM Peak Trips Per Unit |
|---|---|---|---|---|---|
| Single-family | Dwelling Unit | 175 | 210 | 0.75 | 1.01 |

**AM Peak Hour Trips:**

175 units X 0.75 trips/unit = 131 AM Peak Hour trips

Distribution: Enter: 25% (33 trips)

Exit: 75% (98 trips)

**PM Peak Hour Trips:**

175 units X 1.01 trips/unit = 177 PM Peak Hour trips

Distribution: Enter: 64% (113 trips)

Exit: 36% (64 trips)

Table V.2: Average Daily Trip Rates and Trip Generation

| Land Use | Unit | No. Units | ITE Categ. | Trips/ Unit | ADT |
|---|---|---|---|---|---|
| Single-family | Dwelling Unit | 175 | 210 | 9.57 | 1,675 |

**SITE TRIP DISTRIBUTION**

The estimated trip distribution for the subject property shown in the following exhibits and described as follows:

- 35% to/from the north on Pyramid Highway
- 45% to/from the south on Pyramid Highway
- 20% to/from the west on Calle de la Plata
- 5% to/from the east on Calle de la Plata

Exhibit V.1 demonstrates a summary of the Trip Distribution and Exhibit V.2 demonstrates the Site Trips.

Exhibit V.1: Site Trip Distribution

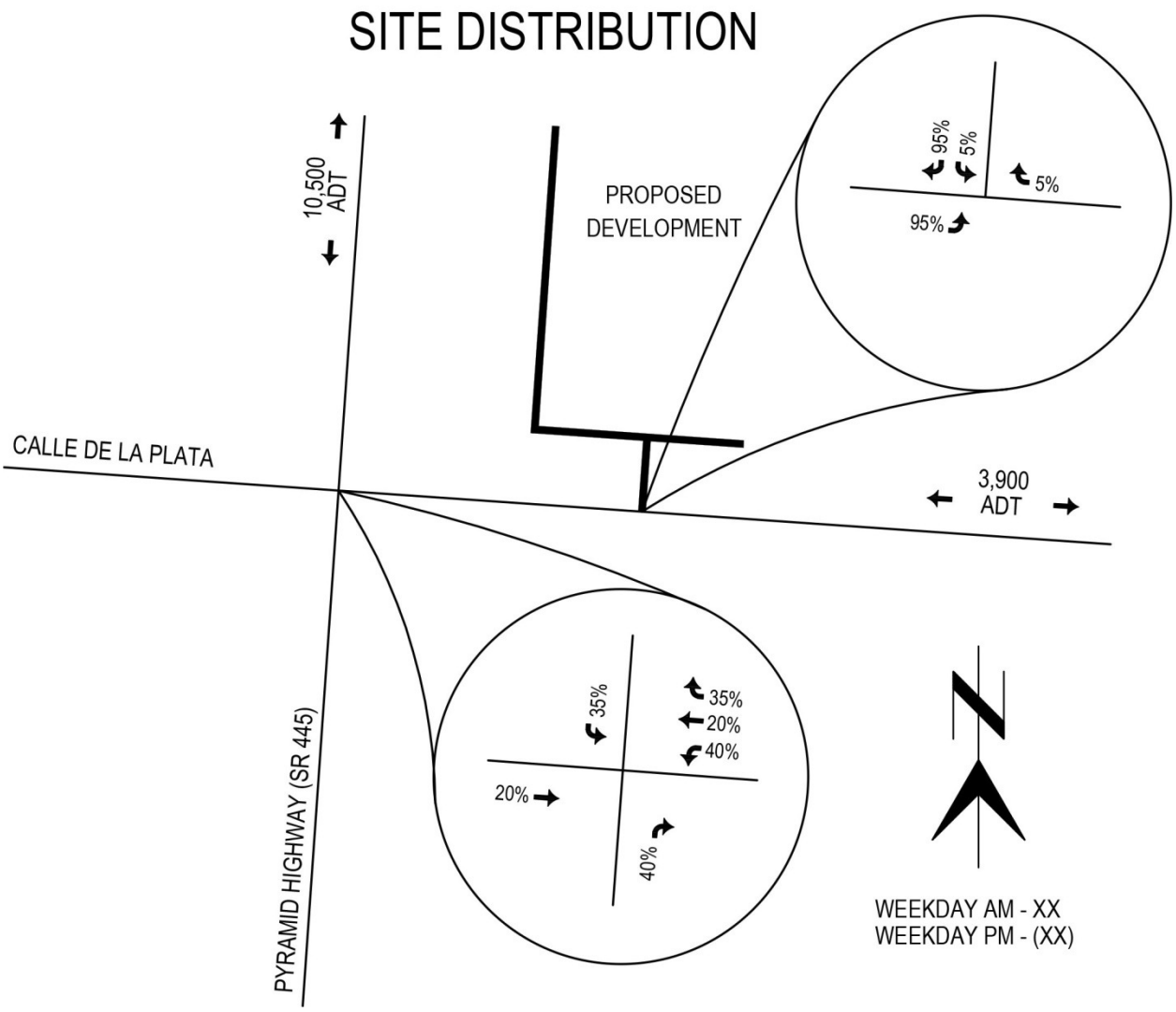
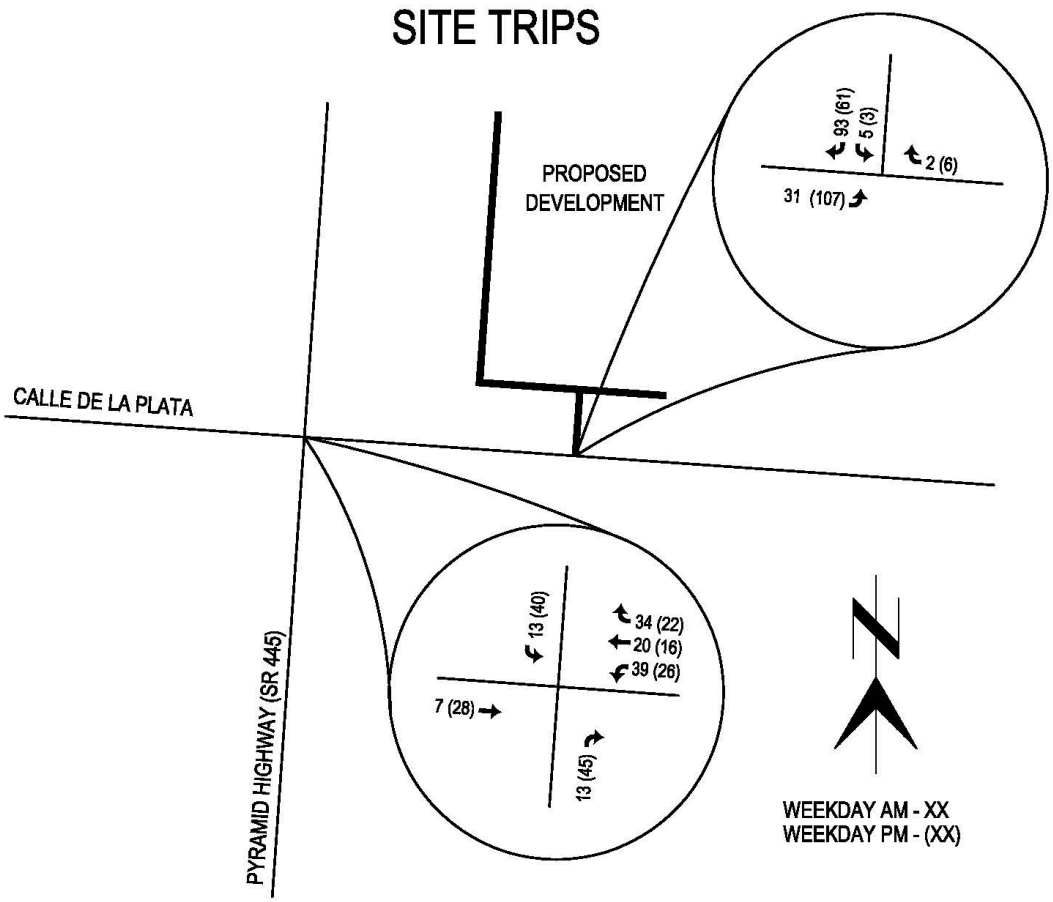


Exhibit V.2: Site Trips

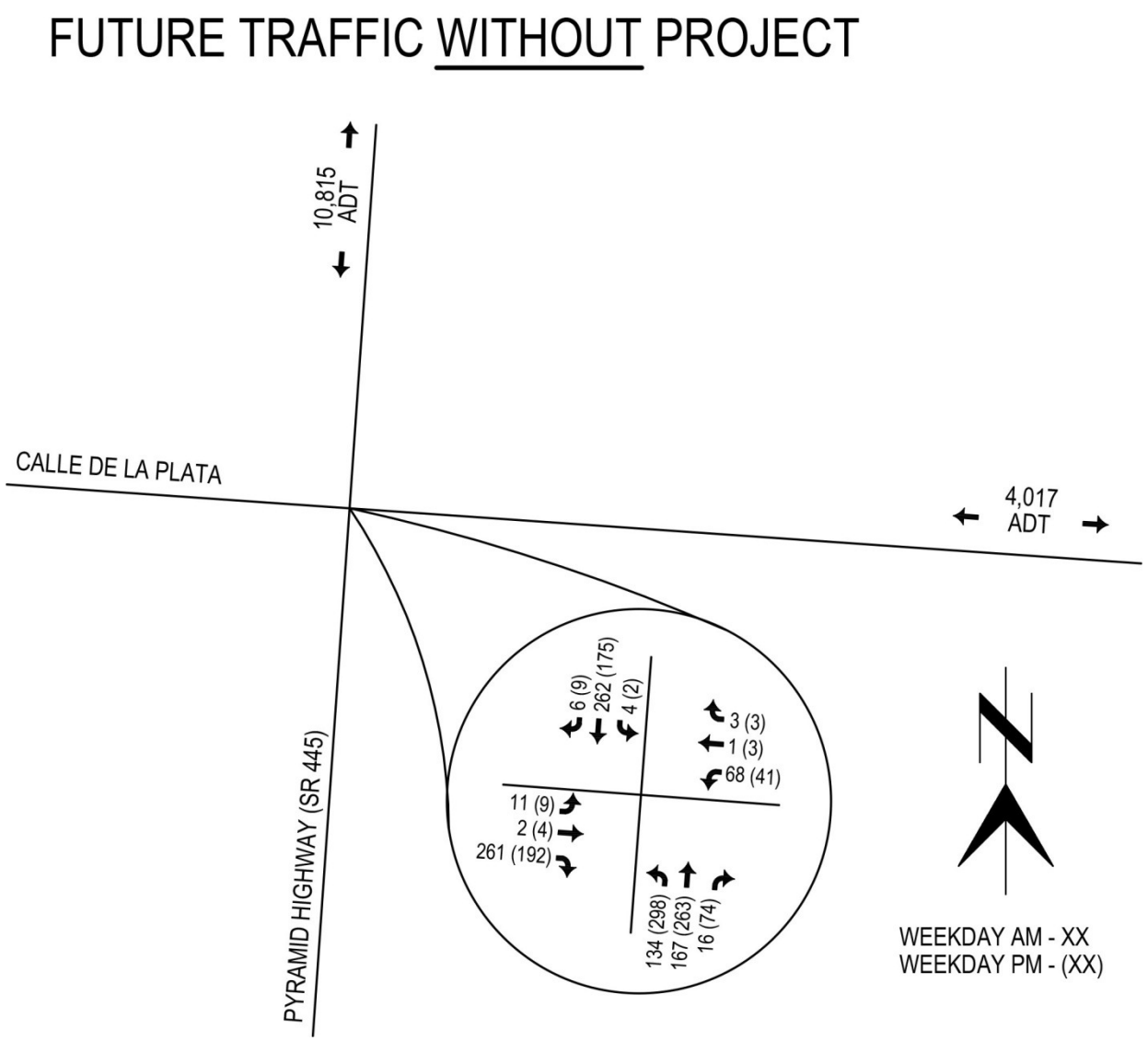


## A. NON-SITE TRAFFIC FORECASTING

Based on the traffic volume counts provided by Nevada Department of Transportation, traffic volumes have remained relatively steady or decreased over the past few years. In order to account for potential economic rebounding, we estimated a conservative 3% increase per year in background traffic for the "no-project" condition.

Exhibit V.A demonstrates a summary of the Future Traffic Volumes without the Project for 2016.

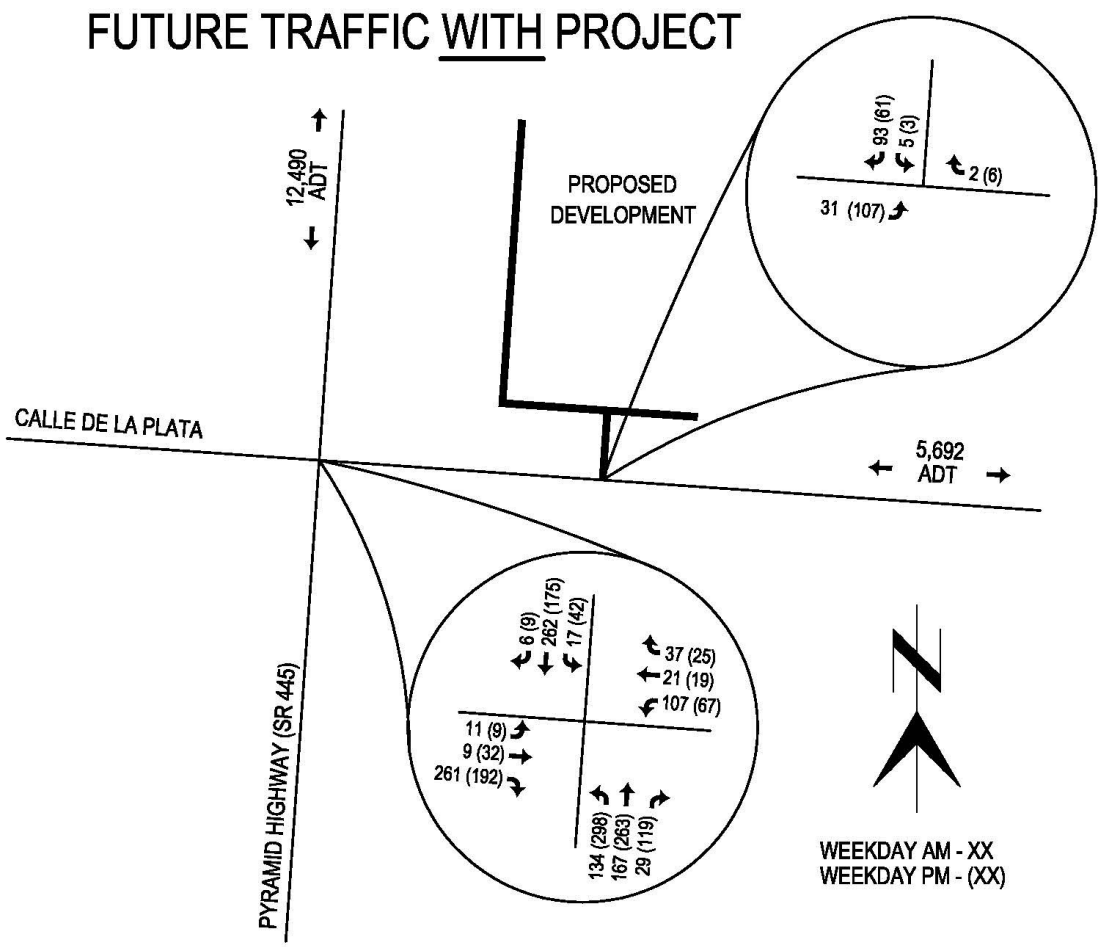
Exhibit V.A: Future Traffic Volumes WITHOUT the Project



## B. TOTAL TRAFFIC

Site traffic volumes were added to the background traffic to project total traffic for the horizon year 2016. The resulting peak hour turning volumes at the project intersection and driveways are demonstrated on Exhibit V.B.

Exhibit V.B: Future Traffic Volumes WITH the Project



# VI. TRAFFIC IMPACT AND CAPACITY ANALYSIS

## A. LEVEL OF SERVICE

Level of service is a qualitative description of how well a roadway or intersection operates under prevailing traffic conditions based on traffic volumes and capacity. A grading system of A through F is utilized. LOS A is free-flowing traffic, whereas LOC F is forced flow and extreme congestion.

**ROADWAY ANALYSIS**

The following excerpt from the Washoe County Regional Transportation Plan gives a detailed qualitative description of the conditions that correspond to each level of service:

| LOS | Condition of Traffic Flow |
|---|---|
| A | Free flow; individual users are virtually unaffected by the presence of others in the traffic stream |
| B | Reasonably free flow; the presence of other users in the traffic stream begins to be noticeable |
| C | Stable flow; each user is significantly affected by the presence of others |
| D | Approaching unstable flow; users experience poor level of comfort and convenience |
| E | Unstable flow; users experience decreasing speed and increasing traffic |
| F | Forced or breakdown flow; users experience frequent slowing and vehicles move in lockstep with the vehicle in front of it |

The level of service standards used by the RTC for assessing the need for street and highway improvements at a planning level are shown in in the following table:

| Regional Level of Service Standards | |
|---|---|
| LOS D | • All regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon |
| LOS E | • All regional roadway facilities projected to carry 27,000 or more ADT at the latest RTP horizon |
| LOS F | • Plumas Street—Plumb Lane to California Avenue<br>• Rock Boulevard—Glendale Avenue to Victorian Avenue<br>• South Virginia Street—Kietzke Lane to South McCarran Boulevard<br>• Sun Valley Boulevard—2nd Avenue to 5th Avenue<br>• Intersection of North Virginia Street and Interstate 80 ramps |
| Except as noted above, all intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting corridors. | |

In previous years and at the time of the previous study for this area, the RTC utilized maximum service flow rates based on the facility type, number of lanes and the average daily traffic on the facility. New software

allows the RTC to perform more a refined analysis of the level of service on the region's roadways. The current method of establishing the level of service on a roadway is based on the ratio of the volume of traffic to the capacity of the road (V/C). This methodology is widely accepted in the industry as a more accurate method of calculating level of service. The following table shows the projected LOS based on the V/C ratio:

| 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 |

The following table presents the previously accepted level of service thresholds for roadway segments:

Exhibit VI.1: Level of Service Table - RTC

TABLE 2
RTC AVERAGE DAILY TRAFFIC ROADWAY LEVEL OF SERVICE THRESHOLDS BY FACILITY TYPE

| 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 (HAC)** | | | | | |
| 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 (MAC)** | | | | | |
| 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 – Low Access Control (LAC)** | | | | | |
| 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 – Ultra-Low Access Control (ULAC)** | | | | | |
| 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 |
| **Arterial – Ultra-Low Access Control (ULAC)** | | | | | |
| 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 |
| **Collector – Ultra-Low Access Control (ULAC)** | | | | | |
| 2 | n/a | n/a | 7,300 | 8,500 | 9,100 |

* Contact the RTC Planning Department for LOS threshold for collector facilities with access controls other than ultra-low access control.
Source: Washoe County 2040 Regional Transportation Plan, RTC

**The Nevada Department of Transportation (NDOT) maintains a policy of LOS D or better on their facilities. Since Pyramid Highway is an NDOT facility, LOS D or better was used as the standard for analysis. Any intersections or roadway segments that degrade from LOS A, B, C, or D to LOS E or F shall be considered an impact.**

Based on the above RTC guidelines, the LOS D threshold for Pyramid Highway south of Calle de la Plata is 19,200 trips and north of Calle de la Plata is 17,500. The expected volume on Pyramid Highway with the proposed development and an increase for future regional traffic is 12,595 trips (V/C=0.71).

**The expected level of service for Pyramid Highway with the future development is LOS C.**

Based on the above RTC guidelines, the LOS E threshold for Calle de la Plata east of Pyramid Highway is 9,100 trips. The expected volume on Calle de la Plata with the proposed development and an increase for future regional traffic is 5,692 trips (V/C=0.63).

**The expected level of service for Calle de la Plata with the future development is LOS B.**

**INTERSECTION ANALYSIS**

***Signalized Intersections***

Signalized intersections were analyzed using the methodology contained in the Highway Capacity Manual. This methodology determines the level of service by comparing the average control delay for all vehicles approaching the intersection to the standard delay thresholds.

***Un-signalized Intersections:***

Un-signalized intersections (side-street stop-controlled) intersection level of service calculations were conducted using the methods contained in Chapter 17 of the Highway Capacity Manual. The LOS rating is based on the average control delay expressed in seconds per vehicle. At side-street stop-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and for the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in the lane.

Table VI.2 on the following page, an excerpt from the previously completed study, shows the Intersection Level of Service Definitions.

Exhibit VI.2: Intersection Level of Service Definitions

**TABLE 1**
**INTERSECTION LEVEL OF SERVICE DEFINITIONS**

| Level of Service | Description | Signalized Intersections (Average Control Delay) [1] | Unsignalized Intersections (Average Control Delay) [2] |
|---|---|---|---|
| A | Represents free flow. Individual users are virtually unaffected by others in the traffic stream. | ≤ 10 | ≤10 |
| B | Stable flow, but the presence of other users in the traffic stream begins to be noticeable. | > 10 to 20 | > 10 to 15 |
| C | Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream. | > 20 to 35 | > 15 to 25 |
| D | Represents high-density, but stable flow. | > 35 to 55 | > 25 to 35 |
| E | Represents operating conditions at or near the capacity level. | > 55 to 80 | > 35 to 50 |
| F | Represents forced or breakdown flow. | > 80 | > 50 |

Sources:
[1] *HCM 2000*, Chapter 16, Signalized Intersections. Values shown are in seconds/vehicle.
[2] *HCM 2000*, Chapter 17, Unsignalized Intersections. Values shown are in seconds/vehicle.

The Calle de la Plate/Pyramid Highway intersection operates at LOS F with and without the addition of the proposed project generated traffic. The primary entrance will operate at acceptable levels of service with side street stop controls.

**A traffic signal is planned at the Calle de la Plata/Pyramid Highway intersection to improve operations to an acceptable level.**

**Overall, the proposed development, with the planned improvements, will have no perceived or measureable impact on the level of service of the adjacent segments or intersections.**

## B. ROADWAY IMPROVEMENTS

This project was evaluated for the need to install turn lanes at the existing intersection of Calle de la Plata and Pyramid Highway. A turn lane "warrant" is a justification for constructing a turn lane, based on traffic volumes at an intersection. Turn lanes are warranted based on these criteria when the peak hour turn lane volume exceeds a trigger based on the two-way daily volume (ADT) on the roadway. The thresholds are as follows:

| | | | |
|---|---|---|---|
| ADT: | 2,500-5,000 | Max Peak Hour Trips: | 100 |
| | 5,000-10,000 | | 70 |
| | >10,000 | | 40 |

There are more than 10,000 vpd and more than 40 peak hour trips at the existing intersection. **A left turn lane is warranted.**

# VII. TRAFFIC SIGNALS

The public often views traffic signals as a cure-all for traffic problems at intersections. As a result, traffic signals have often been installed at intersections where less restrictive traffic control would have been more appropriate and effective. Traffic signal warrants have been developed to establish minimum criteria for evaluating the need for a traffic signal at a specific intersection. These warrants do not define the need for a traffic signal, but merely indicate where further study of a traffic signal installation is justified. When properly justified and installed, traffic signals can have many positive benefits. However, traffic signals also have negative impacts, particularly if the signal is improperly justified or installed. The nine warrants outlined by the MUTCD, Section 4C have been evaluated for the proposed intersection. It should be noted that these warrants have been evaluated using average daily traffic counts and not hourly counts. For that reason, the trips applied to each warrant have been conservatively estimated using the available data.

Warrant 1: Eight Hour Vehicular Volume

The project ADT for Pyramid Highway is 12,595 trips (524 vph) and for Calle de la Plata is 5,797 trips (242 vph). The estimated volumes indicate that while Pyramid Highway is one lane in each direction, this warrant would apply. However, the planned improvements to widen Pyramid Highway remove the warrant.

**Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume**

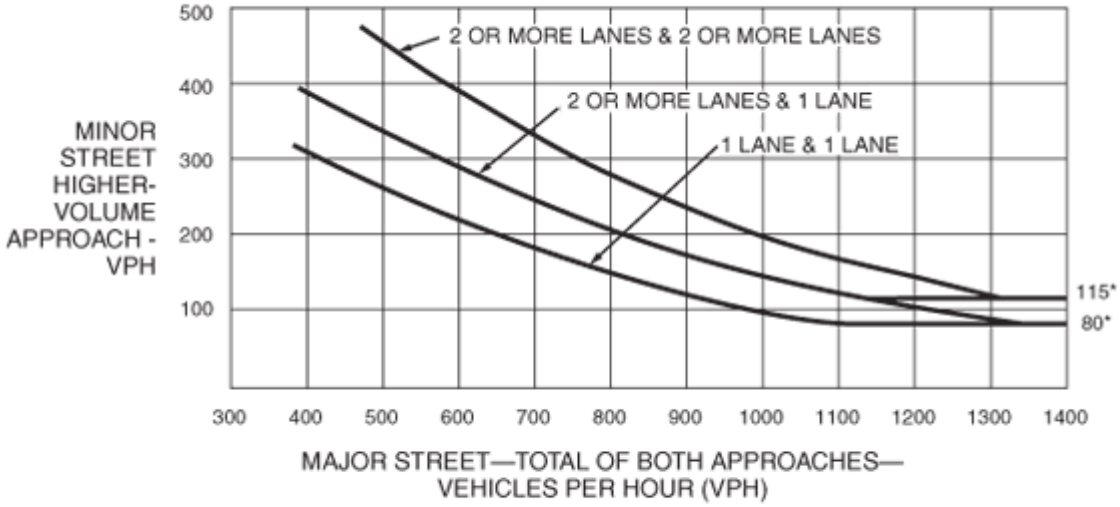
| **Condition A—Minimum Vehicular Volume** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Number of lanes for moving traffic on each approach** | | **Vehicles per hour on major street (total of both approaches)** | | | | **Vehicles per hour on higher-volume minor-street approach (one direction only)** | | | |
| Major Street | Minor Street | 100%[a] | 80%[b] | 70%[c] | 56%[d] | 100%[a] | 80%[b] | 70%[c] | 56%[d] |
| 1 | 1 | 500 | 400 | 350 | 280 | 150 | 120 | 105 | 84 |
| 2 or more | 1 | 600 | 480 | 420 | 336 | 150 | 120 | 105 | 84 |
| 2 or more | 2 or more | 600 | 480 | 420 | 336 | 200 | 160 | 140 | 112 |
| 1 | 2 or more | 500 | 400 | 350 | 280 | 200 | 160 | 140 | 112 |
| | | | | | | | | | |
| **Condition B—Interruption of Continuous Traffic** | | | | | | | | | |
| **Number of lanes for moving traffic on each approach** | | **Vehicles per hour on major street (total of both approaches)** | | | | **Vehicles per hour on higher-volume minor-street approach (one direction only)** | | | |
| Major Street | Minor Street | 100%[a] | 80%[b] | 70%[c] | 56%[d] | 100%[a] | 80%[b] | 70%[c] | 56%[d] |
| 1 | 1 | 750 | 600 | 525 | 420 | 75 | 60 | 53 | 42 |
| 2 or more | 1 | 900 | 720 | 630 | 504 | 75 | 60 | 53 | 42 |
| 2 or more | 2 or more | 900 | 720 | 630 | 504 | 100 | 80 | 70 | 56 |
| 1 | 2 or more | 750 | 600 | 525 | 420 | 100 | 80 | 70 | 56 |

[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Warrant 2: Four-hour Vehicular Volume

For a vehicle per hour on the major street (total of both approaches) of 524vph, the minimum number of vehicles per hour on the minor street (higher volume approach) is 265vph. The estimated 242 vph for Calle de la Plata is below this threshold.

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume**




*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 3: Peak Hour

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. This warrant does not apply to a residential project.

Warrant 4: Pedestrian Volume

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street. Pyramid Highway is not utilized by pedestrians.

Warrant 5: School Crossing

The School Crossing signal warrant is intended for application where the fact that schoolchildren cross the major street is the principal reason to consider installing a traffic control signal. For the purposes of this warrant, the word "schoolchildren" includes elementary through high school students. School children are not anticipated at this intersection. This warrant does not apply to this section of Pyramid Highway.

Warrant 6: Coordinated Signal System

Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles. This warrant does not apply to this section of Pyramid Highway.

Warrant 7: Crash Experience

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. This warrant does not apply to this section of Pyramid Highway.

Warrant 8: Roadway Network

Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network. The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or
B. The intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday).

A major route as used in this signal warrant shall have at least one of the following characteristics:

A. It is part of the street or highway system that serves as the principal roadway network for through traffic flow.
B. It includes rural or suburban highways outside, entering, or traversing a city.
C. It appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.

The intersection of Pyramid Highway and Calle de la Plata is scheduled for improvement with Pyramid Highway is widened.

Warrant 9: Intersection Near a Grade Crossing

The Intersection Near a Grade Crossing signal warrant is intended for use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal. This warrant does not apply to the proposed intersection or this section of Pyramid Highway.

# VIII. TRAFFIC ACCIDENT DATA

Intersection crash data for Pyramid Highway and Calle de la Plata was requested and provided by NDOT and is included in Appendix G of this report for reference. For the five year study period of July 1, 2009 to July 1, 2014 six crashes were reported. Of these crashes, one was fatal; three reported injuries and two were property damage only. The fatality was a one-vehicle crash where the driver apparently over-corrected and ran off the road. It is estimated that the increase in trips at this intersection will not significantly impact the low number of reported crashes.

Safety related deficiencies for Pyramid Highway (SR445) have not been noted in recent studies or shown in recent crash data.

# IX. NDOT ACCESS POLICY

All projects which have or propose to have access to NDOT roadways must include a separate section which discusses adherence to the NDOT access policy, Access Management System and Standards.

Direct access to Pyramid Highway (SR445) is not proposed with this development.

There has been some discussion regarding the possibility of adding direct access to the highway through an adjacent parcel in alignment with the existing Sha Neva Road (Parteli Road). The spacing requirement for Rural Highways at 55 mph is 0.25 mile. This location would meet the spacing requirements should the Developer pursue this option for access.

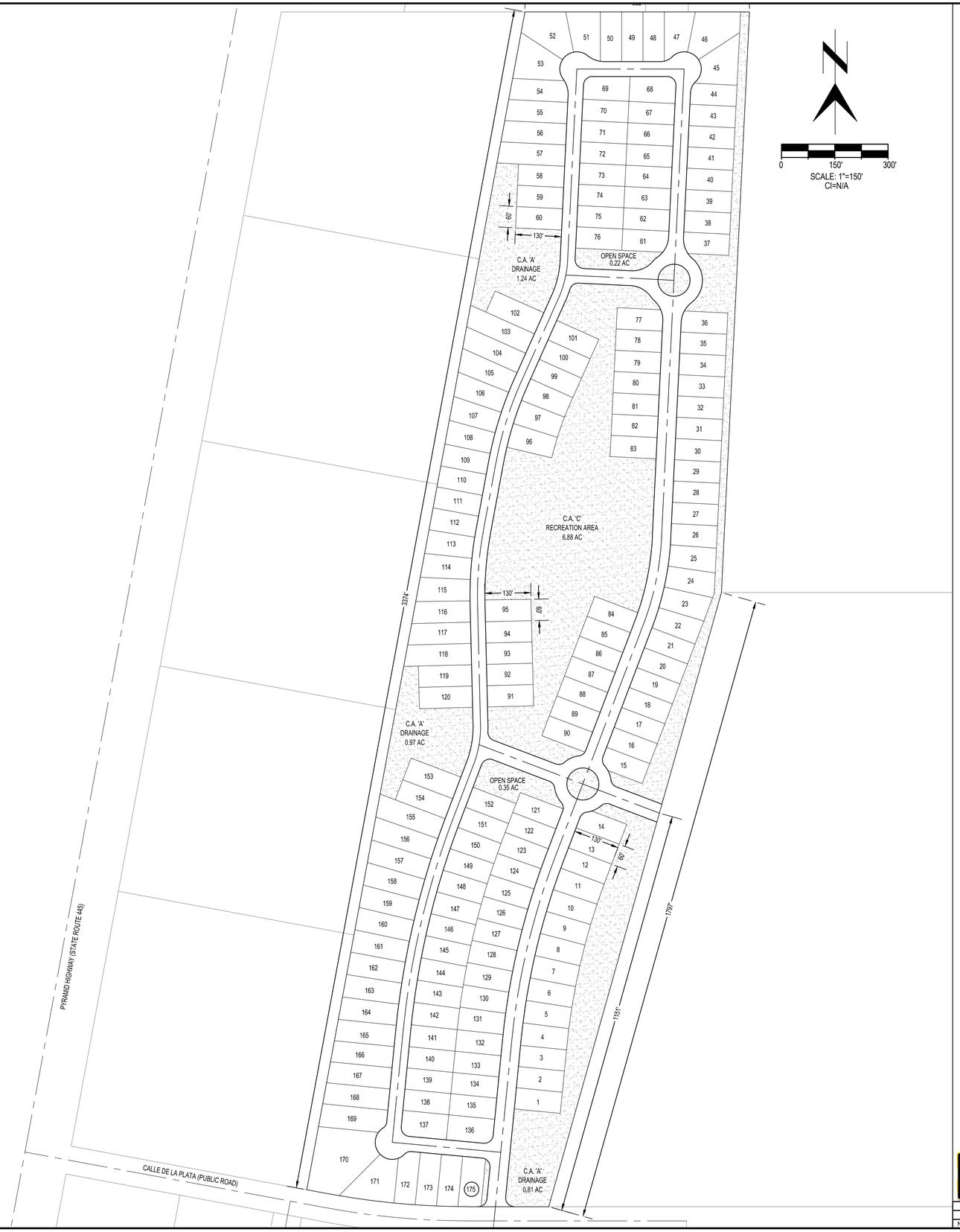
# X. REGIONAL ROAD IMPACT FEE (RRIF)

New development creates a demand for new roadway capacity. The Regional Road Impact Fee (RRIF) is a tool to collect the cost of providing the new capacity for new development. The RRIF is divided into the north service area and the south service area. The funds collected in each service area are to be spent in the same service area. I-80 is the dividing line between the service areas. The proposed development falls in the **North Service Area**. The RRIF fee is $3,783.11 per single-family dwelling. The RRIF funds are designed to build capacity improvements such as new roads and ramps, road widening and intersection improvements, and to preserve right of way for future capacity improvements. The fee previously discussed is based on the current fee schedule as of the date of this study. The current fee schedule went into effect March 2, 2015. The amount of impact fees shall be determined as of the date of payment. The RRIF needs to be paid at the time a building permit is issued or may be deferred to the Certificate of Occupancy, as approved by the local jurisdiction. RRIF Waivers are issued for capital improvements constructed by new development. Waivers may only be used to pay the impact fee due within the designated development of record associated with the waivers.

# APPENDIX A:

# PRELIMINARY SITE LAYOUT FOR SPANISH SPRINGS – CALLE DE LA PLATA

STAR CONSULTING




## SITE PLAN NOTES:

1. THIS PRELIMINARY SITE PLAN WAS CREATED WITHOUT THE BENEFIT OF A BOUNDARY OR TOPOGRAPHICAL SURVEY. ALL MEASUREMENTS ARE APPROXIMATE.
2. PARCEL NUMBER: 534-571-01
3. LOCATED AT 350 CALLE DE LA PLATA IN SPANISH SPRINGS
4. DEVELOPMENT REGULATED BY WASHOE COUNTY, NEVADA
5. APPROXIMATELY 58.5 ACRES WITHIN THE SPANISH SPRINGS PLANNED AREA OF THE WASHOE COUNTY LAND DEVELOPMENT CODE
6. EXISTING TOPOGRAPHY IS GENTLY SLOPING IN UNIFORM SLOPE TOWARD THE NORTHWEST
7. EXISTING ZONING IS NEIGHBORHOOD COMMERCIAL/OFFICE (NC), INDUSTRIAL (I) AND SUBURBAN
8. MASTER PLAN DESIGNATION IS SUBURBAN RESIDENTIAL (SR), INDUSTRIAL (I) AND COMMERCIAL (C)
9. TOWNSHIP 21, RANGE 20, SECTION 23
10. SERVED BY THE TRUCKEE MEADOWS FIRE PROTECTION DISTRICT

CLUSTER OPEN SPACE OPTION:
60' BY 130' PROPOSED LOT (MINIMUM LOT SIZE 7,800 SF) - MAX DENSITY OF 3 RAC = 175 LOTS
IN LIEU OF MDS MINIMUM OF 80' BY 150' (12,000 SF) - PROVIDE CENTRAL PARK AREA OF 4 ACRE OR GREATER

52' ROW (7,600 ADT) USED FOR PORTION OF DEVELOPMENT
42' ROW (1,000 ADT) USED FOR REMAINDER

PROVIDE 30' EMERGENCY ACCESS EASEMENT

BLACKSTONE DEVELOPMENT GROUP

| NO. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| | | | | | |

# PRELIMINARY SITE LAYOUT
# SPANISH SPRINGS

LOTS 1-175 AND COMMON AREA
TYPICAL LOT SIZE: 60' BY 130'

3.0 RESIDENTS PER ACRE - 175 LOTS
7.67 AC CENTRAL PARK & DRAINAGE BASIN
ADDITIONAL 3.92 AC DRAINAGE & 0.5 AC OPEN SPACE

STAR CONSULTING
439 W. PLUMB LANE
RENO, NV 89509
(775) 352-4200
PROJECT NO 14021

| | |
|---|---|
| DRWN. BY | EEH |
| DSGN. BY | EEH |
| CHKD. BY | GWH |

CASE NO.

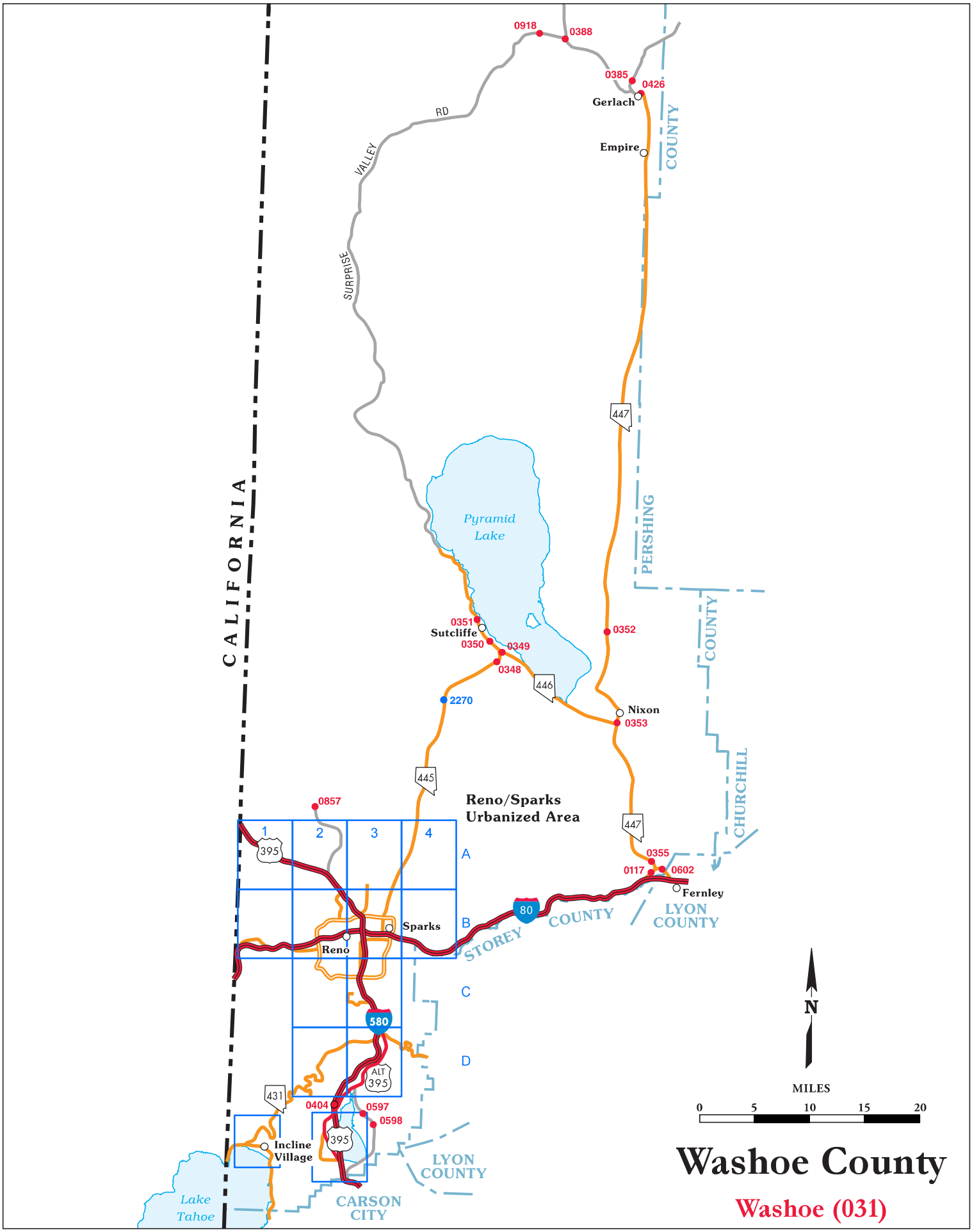
SHEET NO. 1 OF 1

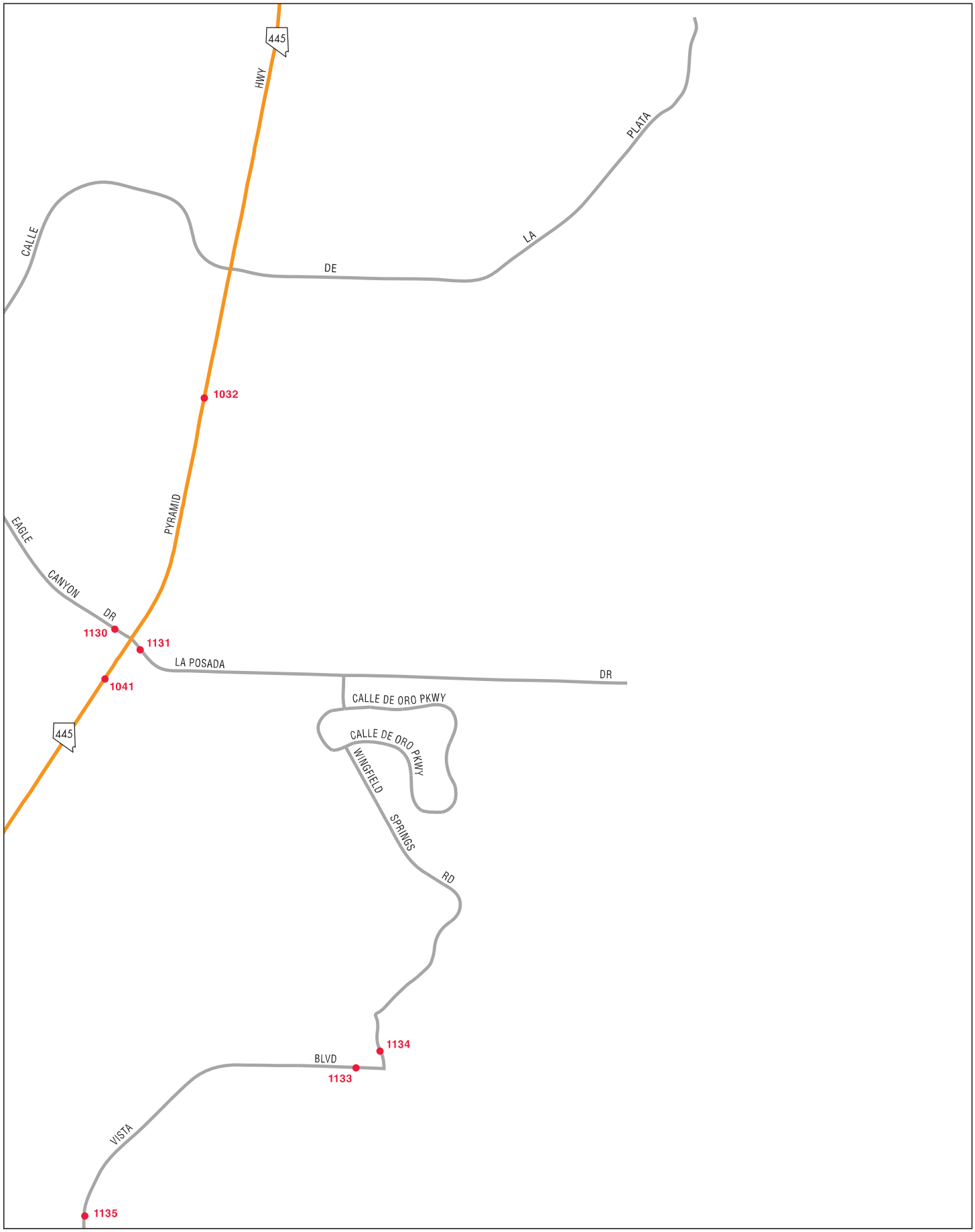
# APPENDIX B:

# 2013 WASHOE COUNTY TRAFFIC COUNTS

STAR CONSULTING


HUMBOLDT
ELKO
WASHOE
PERSHING
LANDER
EUREKA
CHURCHILL
STOREY
WHITE PINE
CARSON CITY
LYON
DOUGLAS
MINERAL
NYE
ESMERALDA
LINCOLN
CLARK
N
NEVADA
MILES
0
50
0
80
KILOMETERS
NEVADA DOT
NEVADA DEPARTMENT OF TRANSPORTATION
LOCATION DIVISION
CARTOGRAPHY
(775) 888-7627


0918
0388
0385
0426
Gerlach
Empire
VALLEY
RD
SURPRISE
COUNTY
447
CALIFORNIA
Pyramid
Lake
PERSHING
COUNTY
0351
Sutcliffe
0350
0349
0348
0352
446
2270
Nixon
0353
445
0857
Reno/Sparks
Urbanized Area
447
CHURCHILL
1
2
3
4
A
B
C
D
395
0355
0117
0602
Fernley
80
Sparks
Reno
LYON
COUNTY
STOREY
COUNTY
580
ALT
395
431
0404
0597
0598
395
Incline
Village
LYON
COUNTY
Lake
Tahoe
CARSON
CITY
N
MILES
0
5
10
15
20
Washoe County
Washoe (031)




# Reno/Sparks
## Urbanized Area

MILES
0 0.5 1

N

# Sheet A-4
## Washoe (031)

Return to Maps

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AADT | AADT | AADT | AADT | AADT | AADT | AADT | AADT | AADT | AADT |
| Station | Route / Location | | | | | | | | | | |
| 0311017 | SR659, McCarran Bl, 500ft N of Plumb Ln. | 25,500 | 25,500 | 26,600 | 24,000 | 21,000 | 20,000 | 22,000* | 22,000* | 23,000 | 22,500* |
| 0311018 | SR659, McCarran Bl, 365ft S of Plumb Ln. | 19,100 | 19,400 | 19,900 | 18,000 | 16,000 | 15,000 | 16,000* | 16,000 | 16,000 | 15,500* |
| 0311019 | IR580, 400ft S of Damonte Ranch Intch N/B off-ramp. | 53,000 | 54,500* | 57,000* | 59,000 | 58,000* | 56,000 | 56,000* | 55,000* | 54,500* | 62,500* |
| 0311027 | US395, N/B on-ramp of the US-395/Clear Acre Intch. | | | | 1,200* | 1,200 | 1,400 | 1,300 | 1,500 | 1,500 | 1,500 |
| 0311028 | US395, N/B off-ramp of the US-395/Clear Acre Intch. | | | | 8,900* | 8,400 | 8,400 | 8,300 | 8,700 | 7,600 | 8,500 |
| 0311031 | SR341, 'C St', btwn Pinion & Kivett Ln | 4,700 | 5,000 | 5,350 | 5,000 | 4,900 | 4,800 | 4,500 | 5,000 | 3,700 | 3,600 |
| 0311032 | SR445, .375 mi N of Sunset Springs Rd. | | | | | 10,000 | 10,000 | 10,000 | 10,000 | 9,600* | 10,500 |
| 0311033 | IR80, W/B off-ramp to US-395 N/B and S/B. | | | | 30,000 | 29,000 | 30,000* | 29,000 | 30,000 | 28,000 | 29,000 |
| 0311035 | IR80, W of Thisbe/Derby Dam Intch 'Exit 36' | | | | | 25,000* | 24,000* | 24,000* | 23,000* | 23,000 | 24,500 |
| 0311039 | Queens Wy, .1 mi E of Probasco Wy. | 1,500 | 1,350 | 1,500 | 1,300 | 1,400 | 1,300 | 1,200 | 1,200 | 1,100 | 1,100 |
| 0311040 | Lincoln Wy, 350 ft W of E McCarran Bl. | 2,650 | 2,600 | 2,450 | 2,400 | 2,100 | 2,200 | 2,000 | 4,900 | 4,600 | 2,000 |
| 0311041 | SR445, Pyramid Hw, .1 mi S of La Posada Rd. | 26,100 | 28,800 | 30,500 | 31,000 | 27,000 | 27,000 | 28,000 | 28,000* | 26,000 | 27,000 |
| 0311042 | Red Baron Bl, 150ft N of Silver Lake Bl. | 1,900 | 1,850 | 1,750 | 1,500 | 1,500 | 1,400 | 1,300 | 1,200 | 1,200* | 1,200 |
| 0311043 | Silver Lake Bl, 500ft S of Stead Bl. | 6,500 | 6,550 | 5,900 | 6,000 | 5,700 | 5,600 | 5,800 | 5,600 | 5,200 | 6,300 |
| 0311044 | Hunter Lake Dr, 300ft N of California Av. | 4,100 | 3,950 | 4,050 | 3,700 | 3,100 | 2,600 | 2,300 | 2,300* | 2,300 | 2,600 |
| 0311045 | Greensburg Cr, .2 mi N of McCarran Bl. | 400 | 420 | 390 | 380 | 360 | 350 | 330 | 330 | 350* | 300* |
| 0311046 | Gibraltar Dr, 90ft S of Cashill Bl. | 540 | 460 | 440 | 480 | 460 | 420 | 410 | 440 | 400 | 450 |

* Data Adjusted or Estimated

# APPENDIX C:

# INFORMATION REPORT: TRIP GENERATION BY ITE

STAR CONSULTING

INFORMATIONAL REPORT

# Trip Generation

By ITE Technical Council Committee 6A6

**The primary objective of Committee 6A6's report, here summarized, is to provide traffic and transportation engineers with a single document and guide on trip generation rates for all land uses and building types. It is intended that the full report, soon to be published by the Institute, will be updated periodically.**

**Members of Committee 6A6 were: Dan Cherepacha (M); Juergen A. Fehr (M); Christopher R. Fleet (A); Lawrence Gassman (M); Lawrence V. Hammel (M); Herman A. J. Kuhn (M); Clinton L. Lefler (M); Gary D. Long (M); and James B. Saag (M). Special thanks are given to the U.S. Department of Transportation, Federal Highway Administration for its assistance in computer programming and analysis.**

**Carl H. Buttke (M)**
**Chairman**

Trip generation rates have been developed for the average weekday, Saturday and Sunday for the peak hours of the generator and of the adjacent street traffic. However, in some cases, only limited data could be obtained and thus may not be too indicative of a particular building type. This report is intended as a guide in estimating the number of trips which may be generated by a specific building or land use.

Variations in generation rates for the same building or land use type exist and have been identified in the report. Because of these variations, sample size and special characteristics of a site being analyzed, extreme care must be made in the use of the rates. The data in this report represents weighted averages of those collected throughout the United States since 1966. At specific sites, the traffic and transportation engineer may wish to modify the generation rate presented in this report because of public transportation service, proximity to other developments which may reduce vehicle trip making through walking or combining trips or because of special characteristics of the site or the surrounding area.

**Definition of Terms.** The following definitions of terms are presented to clarify the terminology used throughout the text and tables:

*Trip:* A single or one-direction vehicle movement with either the origin or destination (exiting or entering) inside the study site.

*Trip End:* The origin or destination of a trip. Each trip has two ends. On a daily basis, each end has two trips: one entering and one exiting for an attractor of trips, and one exiting and one entering for a producer of trips. In this report, trip end refers to a two-direction vehicle movement at the origin or destination of a trip.

*Average Trip Rate:* A weighted average of the number of trips or trip ends per unit of related independent variable, i.e., trip ends per dwelling unit, employee, etc. The average rate was calculated by summing all trips or trip ends and all independent variables where paired data was available and then dividing the trip sum by the sum of the independent variable to obtain a weighted average.

*Average Weekday Vehicle Trip Ends (AWDVTE):* The weighted 24-hour total of all vehicle trips counted to and from a study site from Monday through Friday.

*Average Trip Rate for Peak Hour of Adjacent Street Traffic:* The weighted average trip rate during the hour of the highest volume of traffic passing the site on adjacent streets between 7 and 9 A.M. or between 4 and 6 P.M.

*Average Trip Rate for Peak Hour of Generator:* The weighted trip rate during the hour of highest volume of traffic entering and exiting the study site in the A.M. or in the P.M. It may or may not coincide in time or volume with the trip rate for the peak hour of the adjacent street traffic.

*Independent Variable:* A physical measureable and predictable unit quantifying the study site or generator, i.e., building area, employees, seats, acres, dwelling units, etc.

*Regression Equation:* An expression of the optimal mathematical relationship between two or more related items (variables) according to a specified criterion, as: $Y = a + bX$.

The objective in developing the relationship between X (independent variable) and Y (dependent variable) is to determine values of the parameters "a" and "b" so that the expected error involved in estimating the dependent variable given estimates of the independent variable will be a minimum.

*Correlation Coefficient (R):* A measure of the degree of linear association between two variables. The correlation coefficient indicates the degree of which the model estimated values account for the deviations in the individual observed values of the dependent variable from their mean value. Numerical magnitudes for "least squares" models range from $-1$ to $+1$ with larger absolute values representing higher degrees of linear association. The correlation coefficient for rate models is undefined when the use of a constant of trips is better than the use of the rate model (this does not occur with least square models) (Figure 1).

### Data Collection Procedure

The data analyzed in this report was obtained from various local governmental agencies, consulting engineers, universities and colleges and technical reports from sections of the Institute of Transportation Engineers. No attempt was made to conduct original field surveys for this initial report.

**Field Data Collection.** Generally, the data has been collected with automatic counters varying from one weekday to seven days, by counting vehicular traffic entering and exiting a site. These counts cordoned the site and did not include through traffic. They were made on driveways of sufficient length to avoid double counts of turning vehicles. In some cases, counts were nondirectional and therefore did not separate entering from exiting vehicles. Manual counts supplemented some of the automatic counts to obtain vehicle occupancy and classification, to check the reliability of

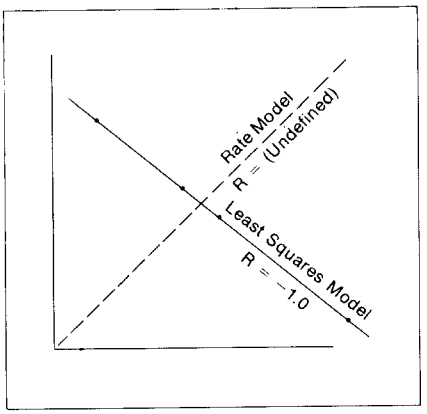



**Figure 1.**

the automatic counters and to obtain directional counts during peak periods where a nondirectional automatic count was being made. In other cases, only manual counts were made during peak periods. Therefore, all data summarized in this report results in vehicle trip generation rather than person trip generation.

Because some data provided only average weekday volumes, some only nondirectional peak hour volumes and some directional peak hour and average weekday volumes, separate analyses were made for each type of measurement to obtain generation rates for various time periods of the day or week. Therefore, in most cases, the peak hour entering plus exiting rates do not equal the total two-way rates. Before the reader uses these rates, an adjustment in the entering and exiting rates usually must be made to equal the total two-way rate.

Data concerning the generator or site was obtained either through personal interviews, actual measurements, telephone conversations or mail-back questionnaires.

**Data Reports.** In almost all cases, the data analyzed in this report was contained in published reports listed in the References, which appear in the full report. Additional data was provided from unpublished analyses by governmental agencies, firms or individuals. The References provide detailed information concerning specific generators; numbers at the bottom of the trip generation rates tables refer to References.

### Generation Rate Analyses

The generation rate analyses were performed by coding the data from each source document and then, by use of computer, determining the related variables, the average trip generation rates and regression equations.

**Coding Format.** All data was coded uniformly on a six-page input form. This form was established to permit additional land uses not studied thus far and to add other variables, if necessary. All data was coded to a Standard Metropolitan Statistical Area (SMSA) when known. The SMSA four-digit code was obtained from the 1970 Geographic Identification Code Scheme of the Bureau of the Census.

A three-digit land use code was established to identify the types of uses studied or requiring study. This code (see Appendix) can easily be expanded to include uses not presently identified.

The data coded and keypunched on cards permits additional computer analyses for any one land use or building type and an opportunity to examine the data from each set and source.

**Statistical Programs.** Three statistical computer programs were used to produce the rates and regression equations and their associated statistics:

*1. Statistics.* Statistics for each variable were developed using program BMDO1D "Simple Data Description."* This program, part of a series of statistical programs developed by the University of California at Los Angeles, computes simple averages and provides measures of dispersion of the variables specified.

Certain methods for handling blanks and special values can be specified by the user. For this analysis, blanks were not counted and did not enter the computations as this situation was the result of missing data or data that was not available from the source studies.

The output of this program includes: means; standard deviations; standard errors of the means; maximum values; minimum values; ranges; and sample sizes. All items were calculated for each land use activity measured, e.g., number of employees, persons, vehicles, etc., and each trip variable. Only the maximum and minimum values and sample sizes were used from this program as the means produced are developed by averaging the mean of each set, and thus not a weighted average.

*2. Rates.* The rates (for all combinations of paired variables) were developed using program MATCH** which was written to obtain rates based on the totals of each variable that had valid data coded for each source study. These rates can be quite different from rates developed using BMDO1D, which develops a rate for each case first, then computes an average rate.

The output from this program (in matrix format) includes: number of observations; means of each dependent variable with respect to all independent variables; means of each independent variable with respect to all dependent variables; and trip rates for each independent/dependent variable combination. A flow chart of the program logic is included in the full report together with an example of the computer program output.

*3. Equations.* Equations were developed using the "Sub-Program Regression" in the Statistical Package for the Social Sciences (SSPS).* This is a stepwise multiple regression program which allows the choice of independent variables that will give the "best" final equation so that certain statistical limitations are satisfied. Use of a specified option allowed the deletion of cases which contain missing data values. Thus, if a value of either an independent or dependent variable were missing from the data, the case involving that variable was eliminated from the calculations.

The output of the program includes: variable means and standard deviations; simple correlation coefficients; and, for each step: the variables in the equation; variables not in the equation; the regression coefficients for each variable; the equation constant; $R^2$; standard error of estimate; degrees of freedom; and the F value.

### Generation Rates

Vehicle trip generation rates, correlation analyses between average weekday vehicle trip ends and the independent variables and regression equations were made for land uses and/or building types within the following categories:

| *ITE Land Use Code* | *Description* |
|---|---|
| 000 | Ports and Terminals |
| 100 | Industrial and Agricultural |
| 200 | Residential |
| 300 | Lodging |
| 400 | Recreation |
| 500 | Institutions |
| 600 | Medical |
| 700 | Office |
| 800 | Retail |
| 900 | Services |

Table 1 summarizes the average weekday vehicle trip ends generation rates for each land use/building type studied. For each measured building or land use within the categories in the table, a description of each has been presented to-

*Complete user documentation, including brief descriptions of the statistical principles involved, is available in "BMD Biomedical Computer Programs Manual," published and distributed by the University of California Press, 2223 Fulton, Berkeley, California 94720.

** Documentation and source deck can be obtained from Dan H. Bryant, Urban Planning Division, Federal Highway Administration, Washington, D.C. 20590.

* Nie, Norman, Dale H. Bent and C. Hadlai Hull, *Statistical Package for the Social Sciences*, New York City: McGraw-Hill Book Co., 1970.

**Table 1. Average Weekday Vehicle Trip Ends Generation Rate Summary.**

| ITE Land Use Code | Land Use of Building Type | Vehicle Trip Ends Rate |
|---|---|---|
| 021 | Commercial Airport | 11.8/Employee |
| 022 | General Aviation Airport | 6.5/Employee |
| 110 | General Light Industrial | 3.2/Employee |
| 130 | Industrial Park | 4.1/Employee |
| 140 | Manufacturing | 2.2/Employee |
| 150 | Warehousing | 4.3/Employee |
| 210 | Single Family Detached Unit | 10.0/Unit |
| 220 | Apartment | 6.1/Unit |
| 230 | Condominium | 5.6/Unit |
| 240 | Mobile Home | 5.4/Unit |
| 310 | Hotel | 10.5/Occupied Room |
| 320 | Motel | 9.6/Occupied Room |
| 330 | Resort Hotel | 10.2/Occupied Room |
| 411 | City Park | 60.0/Acre |
| 412 | County Park | 5.1/Acre |
| 413 | State Park | 0.6/Acre |
| 420 | Marina | 3.8/Boat Berth |
| 430 | Golf Course | 9.1/Acre |
| 501 | Military Base | 1.8/Employee |
| 520 | Elementary School | 0.5/Student |
| 530 | High School | 1.2/Student |
| 540 | Junior/Community College | 1.6/Student |
| 550 | University | 2.4/Student |
| 590 | Library | 41.8/1,000 gross square feet |
| 610 | Hospital | 12.2/Bed |
| 620 | Nursing Home | 2.7/Bed |
| 630 | Clinic | 5.9/Employee |
| 710 | General Office Building | 11.7/1,000 Gross Square Feet |
| 720 | Medical Office | 75.0/1,000 Gross Square Feet |
| 820 | Shopping Center | 116.0 to 26.5/1,000 Gross Square Feet |
| 831 | Quality Restaurant | 56.3/1,000 Gross Square Feet |
| 832 | High Turnover Restaurant | 164.4/1,000 Gross Square Feet |
| 833 | Drive-in Restaurant | 553.0/1,000 Gross Square Feet |
| 844 | Auto Service Station | 748.0/Station |
| 850 | Supermarket | 125.0/1,000 Gross Square Feet |
| 851 | Convenience Market | 578.0/1,000 Gross Square Feet |

**Table 2. Summarization of Rate Tables of Different Types of Dwelling Units.**

| Type of Dwelling Unit | Average Weekday Average | Vehicle Trip Maximum | Ends per Unit Minimum |
|---|---|---|---|
| 210—Single Family Detached Unit | 10.0 | 21.9 | 4.3 |
| 220—General Apartment | 6.1 | 12.3 | 0.5 |
| 221—Low-Rise Apartment | 5.4 | 5.5 | 4.7 |
| 222—High-Rise Apartment | 4.3 | 6.4 | 3.1 |
| 230—Condominium | 5.6 | 5.6 | 5.6 |
| 240—Mobile Home | 5.4 | 6.8 | 2.8 |
| 250—Retirement Community | 3.3 | 4.9 | 2.8 |
| 270—Planned Unit Development | 7.9 | 10.0 | 6.2 |

**Table 3. Correlation Between Average Weekday Vehicle Trip Ends and Independent Variables for Single Family Detached Houses.**

| Independent Variable | Correlation Coefficient (R) |
|---|---|
| Persons | 0.995 |
| Number of Units | 0.937 |
| Number of Vehicles Owned | 0.999 |
| Units per Acre | 0.999 |
| Acres | 0.339 |

gether with the trip characteristics, trip generation rate tables and data limitations. The following is an example of the detail provided for each building type, taken from the section concerning residential land uses (200) and, more specifically, single family detached housing (210).

**Residential 200.** This section summarizes trip generation for all types of residential dwellings. Each category of residential housing, particularly single-family detached housing and apartments, used data from a wide range of units with varying sizes, price ranges, locations and ages. Consequently, there could be as wide a variation in trips generated within each category as there is between different categories. As expected, dwelling units that were larger in size, more expensive or farther away from the Central Business District (CBD) had a higher trip generation rate per unit than those smaller in size, less expensive or closer to the CBD. However, other factors such as geographic location within the country and type of adjacent and nearby development also had an effect on the generation rate. Thus, only the above general statement (instead of some linear relationship) concerning size, cost and location of dwelling unit and the income of the occupant could be made.

Table 2 summarizes the rate tables of the different types of dwelling units. As expected, the single family detached unit has the highest generation rate of all residential uses. This is followed by apartments, with retirement communities having the lowest rate. The rate for planned unit developments which have a mix of single family, detached units and apartments is in between these two types. The single family detached unit has the highest rate because: they are the largest units in size and have more people and more vehicles per unit than the other types of units; they are generally located farther away from shopping centers, employment areas and other attractors than are other types; and they have fewer alternate modes available because they are not as concentrated as other types of units.

**Single Family Detached Housing 210.** Any single family detached home on an individual lot is included in this category. A typical example is a home in a modern subdivision.

Slightly over 200 different studies were made of subdivisions containing single family homes. The average size subdivision contained 506 dwelling units for a total of more than 105,000 dwellings studied. These subdivisions were located primarily in suburban areas throughout the United States.

The average development density was 3.5 units per acre with 3.7 persons per

Table 4.

## SUMMARY OF TRIP GENERATION RATES

Land Use/Building Type Single Family Detached House ITE Land Use Code 210

Independent Variable—Trips per Dwelling Unit

| | | | Average Trip Rate | Maximum Rate | Minimum Rate | Correlation Coefficient | Number of Studies | Average Size of Independent Variable/Study |
|---|---|---|---|---|---|---|---|---|
| **Average Weekday Vehicle Trip Ends** | | | 10.0 | 21.9 | 4.3 | | 208 | 506 |
| Peak Hour of Adjacent Street Traffic | A.M. Between 7 and 9 | Enter | 0.3 | 0.6 | 0.1 | | 37 | 248 |
| | | Exit | 0.6 | 1.7 | 0.2 | | 38 | 258 |
| | | Total | 0.8 | 2.3 | 0.4 | | 173 | 269 |
| | P.M. Between 4 and 6 | Enter | 0.7 | 1.8 | 0.3 | | 38 | 245 |
| | | Exit | 0.4 | 1.2 | 0.1 | | 38 | 245 |
| | | Total | 1.0 | 3.0 | 0.4 | | 196 | 292 |
| Peak Hour of Generator | A.M. | Enter | 0.3 | 0.6 | 0.1 | | 38 | 245 |
| | | Exit | 0.6 | 1.7 | 0.2 | | 38 | 245 |
| | | Total | 0.8 | 2.3 | 0.4 | | 175 | 271 |
| | P.M. | Enter | 0.7 | 1.8 | 0.3 | | 40 | 252 |
| | | Exit | 0.4 | 1.2 | 0.1 | | 38 | 245 |
| | | Total | 1.0 | 3.0 | 0.4 | | 193 | 261 |
| **Saturday Vehicle Trip Ends** | | | 10.1 | 14.7 | 6.3 | | 43 | 292 |
| Peak Hour of Generator | | Enter | 0.5 | 1.0 | 0.4 | | 21 | 273 |
| | | Exit | 0.5 | 0.7 | 0.3 | | 21 | 273 |
| | | Total | 1.0 | 1.7 | 0.7 | | 35 | 296 |
| **Sunday Vehicle Trip Ends** | | | 8.8 | 11.7 | 0.5 | | 38 | 301 |
| Peak Hour of Generator | | Enter | 0.5 | 0.8 | 0.3 | | 19 | 252 |
| | | Exit | 0.5 | 1.2 | 0.4 | | 19 | 252 |
| | | Total | 1.0 | 2.0 | 0.7 | | 34 | 284 |

Source Numbers 1, 4, 5, 6, 7, 8, 11, 12, 13, 14, 16, 19, 20, 21, 24, 26, 34, 35, 36, 38, 40, 71, 72 (references appear in the committee's full report, available from ITE).

ITE Technical Committee 6A-6—Trip Generation Rates

Date:

unit. The average automobile ownership measured was 1.6 vehicles per unit.

*Trip Characteristics.* The analysis of correlation between average weekday vehicle trip ends and all measured independent variables is shown in Table 3.

Although the number of vehicles and number of residents have the highest correlations with average weekday trip ends, these variables have limited use. This is because the number of vehicles and residents is difficult to obtain and very few of the studies contained this data, and because the data is also difficult to predict. The number of units has a high correlation with average weekday vehicle trip ends. This variable is best because it is contained in most studies, it is easy to project and convenient to use.

As indicated in Table 4, single family dwellings generate on the average 10 vehicle trip ends per weekday per dwelling unit. Saturday vehicle trip generation is slightly higher; on Sunday, it is lower.

The regression equations developed for calculating the average weekday vehicle trip ends (AWDVTE) are as follows:

$$\begin{aligned} \text{AWDVTE} &= 138 + 8.17 \times \text{Units} \\ &\qquad R = 0.937 \\ &= -100 + 2.55 \times \text{Persons} \\ &\qquad R = 0.995 \\ &= -185 + 6.76 \times \text{Vehicles} \\ &\qquad R = 0.999 \end{aligned}$$

Some data is from studies conducted in the late 1960s and therefore should be updated. Additional data concerning auto occupancy and other modes of transportation is necessary.

### Data Limitations

As indicated in the trip generation table, the data presented has limitations. The basic limitation, and one reason for variations in rates, is the sample size of counts at some generators and for peak hours for most generators. Additional data is needed for most generators to state more accurately the peak hour entering and exiting rates.

Another reason for variation in the generation rates is caused by different lengths of count periods and the time of the year the traffic volumes were counted. There exist daily and seasonal variations for most generators. In some cases, full week counts were made to define the average weekday and in other cases, a single day's count was obtained. In almost no case was the generation measurement adjusted for seasonal variations. This is especially true for shopping centers.

Variations in generation rates may also exist because of the location of the generator studied either within a metropolitan area or within the U.S. These locations have been identified in the data sets but no separate analyses have been made to determine if a difference exists because of location.

In all cases, the generation rates presented in this report represent driveway volumes of vehicles entering and exiting the site. For some building types, such as retail establishments, the generation rate could overstate the volume of traffic when assigned to the adjacent street system because some traffic is attracted to the site from the passing stream of traffic. That portion of the total generated traffic attracted to the site would pass on the adjacent street system whether or not the site were developed. It is essential that heavy effort be focused on defining how much of the total generated traffic to all building types would be attracted from the passing adjacent street traffic in order to define more accurately the traffic impact on the street system caused by development of a site.

The data summarized in this report is only for vehicle trip ends and does not include all person trip ends by mode. More data is needed for each building and land use type to define vehicle occupancy rates and person trip generation rates by mode of travel.

More data is also needed to define generation rates for the following types of buildings or land uses:

- water ports
- truck terminals
- railroad terminals
- low- and high-rise apartments
- condominiums
- retirement communities
- residential planned unit developments containing a mixture of duplexes, apartments and/or single family units
- day care centers
- churches
- museums
- libraries
- hospitals
- nursing homes
- clinics
- medical offices
- government buildings
- specialty shopping centers containing a mixture of small specialty shops and restaurants
- building materials retail establishments
- high quality restaurants
- drinking establishments
- banks, savings and loans, real estate offices, insurance offices and other financial services
- recreational uses.

### Update Procedure

The Institute is establishing a formal procedure to update this report and to add data for additional land uses or building types not sufficiently covered in the report and to develop information on person trip ends by mode.

It is recommended that all ITE districts and sections be involved in this continual update procedure. These organizations, through their respective technical committees, can collect data from at least one or more sites annually and send it either on keypunch cards or on the trip generation coding sheets to the ITE Technical Council. In many cases, traffic counters, or even personnel, may be available from time to time to conduct a generation study in a given area.

It is also proposed that ITE work with the U.S. Department of Transportation, state, county and city departments of transportation or traffic engineering and with private consultants to obtain additional current data and include it in the updated reports. In this manner, a continual, uniform method of obtaining and summarizing the current trip generation data for all types of special generators, land uses and building types will be produced.

To implement this update procedure, the ITE Technical Council is establishing a permanent committee on trip generation rates for special generators, land uses or building types to update this report at least every two years.

The function of this committee will be to:

1. Store all trip generation data.
2. Coordinate with ITE district and section technical committees, government agencies and private consultants for the collection of additional data.
3. Distribute trip generation coding sheets and instructions to those collecting data.
4. Maintain computer program for trip generation analyses and summarization.
5. Maintain and modify when necessary a uniform procedure for collecting data.
6. Summarize trip generation data.
7. Conduct special trip generation analyses when appropriate.
8. Revise trip generation rate tables and appropriate text of report on basis of the additional data.
9. Establish data collection needs in areas where deficiencies exist or where little information is available.

The following procedure is presented to obtain new generation data from actual traffic volume counts. It is recommended that it be followed when collecting data and to transmit it on the coding sheets shown in the full report or on keypunch cards.

- Count a special generator where automatic counts can be made on drives without double-counting turning vehicles and without counting through traffic. Preferably, directional counts should be made. The site should be self-contained with adequate parking not shared by other activities.

• Conduct seven-day automatic counts during a typical week of the year to provide data concerning the average weekday, Saturday and Sunday and peak hours.
• Supplement automatic counts with a manual count for several hours on a weekday to record hourly inbound and outbound vehicular traffic by classification and vehicle occupancy and to compare with corresponding automatic counters to determine a counter factor for adjusting the raw automatic counts.
• Where recording or directional counts cannot be made automatically, manual counts should be made on a typical weekday during the A.M. and P.M. peak two-hour periods of the special generator being counted and that of the adjacent street traffic to record the peak-hour entering and exiting volumes.
• Where recording or directional counts cannot be made automatically, manual counts should be made on a typical weekday during the A.M. and P.M. peak two-hour periods of the special generator being counted and that of the adjacent street traffic to record the peak-hour entering and exiting volumes.
• Where possible, supplement the above work with manual counts or controlled interviews to determine average weekday person trip ends by mode and determine how many trips were actually generated by the site and how many trips were attracted to the site from the adjacent street traffic normally passing the site.
• Data concerning the site should be obtained through interviews with the site owner or manager and through physical measurements, if necessary. Information on the maximum number of related variables should be obtained to determine which is the best related to trip generation. In all cases, it is essential to obtain the number of employees, the gross building area, the number of occupied rooms or dwelling units, the population and the acreage of development.
• Code data on coding forms by following instructions contained in the full report.
• Obtain trip generation bibliography number from permanent committee and, if necessary, a new land use or building type code if one does not already exist.
• Transmit data to Technical Council.

## APPENDIX

### Trip Generation Land Use Code

**000 Port and Terminal**
010 Water Port
020 Airport
021 Commercial Airport
022 General Aviation Airport
030 Truck Terminal
040 Railroad Terminal

**100 Industrial/Agricultural**
110 General Light Industrial
120 General Heavy Industrial
130 Industrial Park
140 Manufacturing
150 Warehousing
160 Construction
170 Utility
180 Agricultural

**200 Residential**
210 Single Family Detached Housing
220 Apartment
221 Low-Rise Apartment
230 Condominium
231 Low-Rise Condominium
232 High-Rise Condominium
240 Mobile Home
250 Retirement Community
260 Recreational Home
270 Planned Unit Development

**300 Lodging**
310 Hotel
320 Motel
330 Resort Hotel

**400 Recreational**
410 Park
411 City Park
412 County Park
413 State Park
420 Marina
430 Golf Course
440 Theater
441 Live Theater
442 Music Theater
443 Movie-Theater (sit down)
444 Drive-In Theater
450 Stadium
451 Baseball/Football
452 Horse Race
453 Auto Race
454 Dog Race
460 Camp
480 Amusement Park

**500 Institutional**
501 Military Base
510 Preschool
520 Elementary School
530 High School
540 Junior/Community College
550 University
560 Church
570 Court
580 Museums/Gallery
590 Library

**600 Medical**
610 Hospital
620 Nursing Home
630 Clinic

**700 Office**
710 General Office Building
720 Medical Office Building
730 Government Office Building
740 Civic Center
750 Office Park
760 Research Center

**800 Retail**
810 Retail/General Merchandise
820 Shopping Center
821 Regional Shopping Center—over 500,000 G.L.F.A.
822 Community Shopping Center—100,000 to 500,000 G.L.F.A.
823 Neighborhood Shopping Center—under 100,000 G.L.F.A.
824 Discount Shopping Center
825 Specialty Retail Center
826 Specialty Store
827 Building Material
830 Restaurant
831 Quality Restaurant
832 High Turnover Sit-Down Restaurant
833 Drive-In Restaurant
834 Drinking Place
840 Auto
841 New Car Sale
842 Used Car Sale
843 Auto Parts Sale
844 Service Station
845 Tire, Battery and Accessory
846 Car Wash
847 Auto Repair
848 Highway Oasis (including truck fuel, minimal trucker and mechanical services)
849 Truck Stop (including food, auto and truck mechanical services, trucker supplies and trucker overnight sleeping accommodations)
850 Food Store
851 Convenience Market
860 Wholesale
870 Apparel
890 Furniture

**900 Services**
910 Financial
911 Bank (walk-in)
912 Drive-In Bank
913 Savings and Loan (walk-in)
914 Drive-In Savings and Loan
915 Stock Broker
916 Lending Agency
920 Real Estate
930 Insurance

# APPENDIX D:

# TRIP GENERATION RATES, PLOTS AND EQUATIONS BY ITE, 6TH EDITION

STAR CONSULTING

# INSTITUTE OF TRANSPORTATION ENGINEERS
# COMMON TRIP GENERATION RATES (PM Peak Hour)

**(Trip Generation Manual, 9th Edition)**

| Code | Description | Unit of Measure | Trips Per Unit | |
|---|---|---|---|---|
| **PORT AND TERMINAL** | | | | |
| 30 | Truck Terminal | Acres | 6.55 | |
| 90 | Park and Ride Lot with Bus Service | Parking Spaces | 0.62 | |
| **INDUSTRIAL** | | | | |
| 110 | General Light Industrial | 1,000 SF | 0.97 | |
| 120 | General Heavy Industrial | Acres | 2.16 | |
| 130 | Industrial Park | 1,000 SF | 0.85 | |
| 140 | Manufacturing | 1,000 SF | 0.73 | |
| 150 | Warehousing | 1,000 SF | 0.32 | |
| 151 | Mini-Warehouse | 1,000 SF | 0.26 | |
| 152 | High-Cube Warehouse | 1,000 SF | 0.12 | |
| 170 | Utilities | 1,000 SF | 0.76 | |
| **RESIDENTIAL** | | | | |
| 210 | Single-Family Detached Housing | Dwelling Units | 1.00 | |
| 220 | Apartment | Dwelling Units | 0.62 | |
| 221 | Low-Rise Apartment | Dwelling Units | 0.58 | |
| 230 | Residential Condominium / Townhouse | Dwelling Units | 0.52 | |
| 240 | Mobile Home Park | Dwelling Units | 0.59 | |
| 251 | Senior Adult Housing - Detached | Dwelling Units | 0.27 | |
| 252 | Senior Adult Housing - Attached | Dwelling Units | 0.25 | |
| 253 | Congregate Care Facility | Dwelling Units | 0.17 | |
| 254 | Assisted Living | Beds | 0.22 | |
| 255 | Continuing Care Retirement Community | Dwelling Units | 0.16 | |
| **LODGING** | | | | |
| 310 | Hotel | Rooms | 0.60 | |
| 320 | Motel | Rooms | 0.47 | |
| 330 | Resort Hotel | Rooms | 0.42 | |
| **RECREATIONAL** | | | | * |
| 411 | City Park | Acres | 0.19 | |
| 412 | County Park | Acres | 0.09 | * |
| 413 | State Park | Acres | 0.07 | |
| 415 | Beach Park | Acres | 1.30 | |
| 416 | Campground / Recreation Vehicle Park | Camp Sites | 0.27 | |
| 417 | Regional Park | Acres | 0.20 | |
| 420 | Marina | Berths | 0.19 | |
| 430 | Golf Course | Acres | 0.30 | |
| 431 | Miniature Golf Course | Holes | 0.33 | |

| Code | Description | Unit of Measure | Trips Per Unit | |
|---|---|---|---|---|
| 432 | Golf Driving Range | Tees / Driving Positions | 1.25 | |
| 433 | Batting Cages | Cages | 2.22 | |
| 435 | Multi-Purpose Recreational Facility | Acres | 5.77 | |
| 437 | Bowling Alley | 1,000 SF | 1.71 | |
| 441 | Live Theater | Seats | 0.02 | |
| 443 | Movie Theater without Matinee | 1,000 SF | 6.16 | |
| 444 | Movie Theater with Matinee | 1,000 SF | 3.80 | |
| 445 | Multiplex Movie Theater | 1,000 SF | 4.91 | |
| 452 | Horse Race Track | Acres | 4.30 | * |
| 454 | Dog Race Track | Attendance Capacity | 0.15 | |
| 460 | Arena | Acres | 3.33 | * |
| 473 | Casino / Video Lottery Establishment | 1,000 SF | 13.43 | |
| 480 | Amusement Park | Acres | 3.95 | |
| 488 | Soccer Complex | Fields | 17.70 | |
| 490 | Tennis Courts | Courts | 3.88 | |
| 491 | Racquet / Tennis Club | Courts | 3.35 | |
| 492 | Health / Fitness Club | 1,000 SF | 3.53 | |
| 493 | Athletic Club | 1,000 SF | 5.96 | |
| 495 | Recreational Community Center | 1,000 SF | 1.45 | |
| **INSTITUTIONAL** | | | | |
| 520 | Elementary School | 1,000 SF | 1.21 | |
| 522 | Middle School / Junior High School | 1,000 SF | 1.19 | |
| 530 | High School | 1,000 SF | 0.97 | |
| 536 | Private School (K-12) | Students | 0.17 | |
| 540 | Junior / Community College | 1,000 SF | 2.54 | |
| 560 | Church | 1,000 SF | 0.55 | |
| 565 | Daycare Center | 1,000 SF | 12.46 | |
| 566 | Cemetery | Acres | 0.84 | |
| 571 | Prison | 1,000 SF | 2.91 | |
| 580 | Museum | 1,000 SF | 0.18 | |
| 590 | Library | 1,000 SF | 7.30 | |
| 591 | Lodge / Fraternal Organization | Members | 0.03 | |
| **MEDICAL** | | | | |
| 610 | Hospital | 1,000 SF | 0.93 | |
| 620 | Nursing Home | 1,000 SF | 0.74 | |
| 630 | Clinic | 1,000 SF | 5.18 | |
| 640 | Animal Hospital / Veterinary Clinic | 1,000 SF | 4.72 | |

| Code | Description | Unit of Measure | Trips Per Unit |
|---|---|---|---|
| **OFFICE** | | | |
| 710 | General Office Building | 1,000 SF | 1.49 |
| 714 | Corporate Headquarters Building | 1,000 SF | 1.41 |
| 715 | Single Tenant Office Building | 1,000 SF | 1.74 |
| 720 | Medical-Dental Office Building | 1,000 SF | 3.57 |
| 730 | Government Office Building | 1,000 SF | 1.21 |
| 732 | United States Post Office | 1,000 SF | 1.22 |
| 733 | Government Office Complex | 1,000 SF | 2.85 |
| 750 | Office Park | 1,000 SF | 1.48 |
| 760 | Research and Development Center | 1,000 SF | 1.07 |
| 770 | Business Park | 1,000 SF | 1.29 |
| **RETAIL** | | | |
| 812 | Building Materials and Lumber Store | 1,000 SF | 4.49 |
| 813 | Free-Standing Discount Superstore | 1,000 SF | 4.35 |
| 814 | Variety Store | 1,000 SF | 6.82 |
| 815 | Free Standing Discount Store | 1,000 SF | 4.98 |
| 816 | Hardware / Paint Store | 1,000 SF | 4.84 |
| 817 | Nursery (Garden Center) | 1,000 SF | 6.94 |
| 818 | Nursery (Wholesale) | 1,000 SF | 5.17 |
| 820 | Shopping Center | 1,000 SF | 3.71 |
| 823 | Factory Outlet Center | 1,000 SF | 2.29 |
| 826 | Specialty Retail Center | 1,000 SF | 2.71 |
| 841 | New Car Sales | 1,000 SF | 2.62 |
| 842 | Recreational Vehicle Sales | 1,000 SF | 2.54 |
| 843 | Automobile Parts Sales | 1,000 SF | 5.98 |
| 848 | Tire Store | 1,000 SF | 4.15 |
| 850 | Supermarket | 1,000 SF | 9.48 |
| 851 | Convenience Market (Open 24 Hours) | 1,000 SF | 52.41 |
| 852 | Convenience Market (Open 15-16 Hours) | 1,000 SF | 34.57 |
| 853 | Convenience Market with Gasoline Pumps | 1,000 SF | 50.92 |
| 854 | Discount Supermarket | 1,000 SF | 8.34 |
| 857 | Discount Club | 1,000 SF | 4.18 |
| 860 | Wholesale Market | 1,000 SF | 0.88 |
| 861 | Sporting Goods Superstore | 1,000 SF | 1.84 |
| 862 | Home Improvement Superstore | 1,000 SF | 2.33 |
| 863 | Electronics Superstore | 1,000 SF | 4.50 |
| 864 | Toy / Children's Superstore | 1,000 SF | 4.99 |
| 866 | Pet Supply Superstore | 1,000 SF | 3.38 |
| 867 | Office Supply Superstore | 1,000 SF | 3.40 |
| 875 | Department Store | 1,000 SF | 1.87 |
| 876 | Apparel Store | 1,000 SF | 3.83 |
| 879 | Arts and Craft Store | 1,000 SF | 6.21 |
| 880 | Pharmacy / Drugstore without Drive-Through Window | 1,000 SF | 8.4 |
| 881 | Pharmacy / Drugstore with Drive-Through Window | 1,000 SF | 9.91 |
| 890 | Furniture Store | 1,000 SF | 0.45 |
| 896 | DVD/Video Rental Store | 1,000 SF | 13.60 |
| **SERVICES** | | | |
| 911 | Walk-In Bank | 1,000 SF | 12.13 |
| 912 | Drive-In Bank | 1,000 SF | 24.30 |
| 918 | Hair Salon | 1,000 SF | 1.93 |
| 925 | Drinking Place | 1,000 SF | 11.34 |
| 931 | Quality Restaurant | 1,000 SF | 7.49 |
| 932 | High-Turnover (Sit-Down) Restaurant | 1,000 SF | 11.15 |
| 933 | Fast Food Restaurant without Drive-Through Window | 1,000 SF | 26.15 |
| 934 | Fast Food Restaurant with Drive-Through Window | 1,000 SF | 33.84 |
| 935 | Fast Food Restaurant with Drive-Through Window and No Indoor Seating | 1,000 SF | 153.85 |
| 936 | Coffee / Donut Shop without Drive-Through Window | 1,000 SF | 40.75 |
| 937 | Coffee / Donut Shop with Drive-Through Window | 1,000 SF | 42.8 |
| 938 | Coffee / Donut Shop with Drive-Through Window and No Indoor Seating | 1,000 SF | 75 |
| 940 | Bread / Donut / Bagel Shop with Drive-Through Window | 1,000 SF | 18.99 |
| 941 | Quick Lubrication Vehicle Shop | Service Bays | 5.19 |
| 942 | Automobile Care Center | 1,000 SF | 3.11 |
| 943 | Automobile Parts and Service Center | 1,000 SF | 4.46 |
| 944 | Gasoline / Service Station | Fueling Positions | 13.87 |
| 945 | Gasoline / Service Station with Convenience Market | Fueling Positions | 13.51 |
| 946 | Gasoline / Service Station with Convenience Market and Car Wash | Fueling Positions | 13.94 |
| 947 | Self Service Car Wash | Stalls | 5.54 |
| 948 | Automated Car Wash | 1,000 SF | 14.12 |
| 950 | Truck Stop | 1,000 SF | 13.63 |

**Note: All land uses in the 800 and 900 series are entitled to a "passby" trip reduction of 60% if less than 50,000 ft$^2$ or a reduction of 40% if equal to or greater than 50,000 ft$^2$.**

* Approximated by 10% of Weekday average rate.

# APPENDIX E:

# TRIP GENERATION RATES, 9TH EDITION

STAR CONSULTING

# TRIP GENERATION

## 6th Edition • Volume 1 of 3

**TRIP GENERATION RATES, PLOTS, AND EQUATIONS**

- Port and Terminal (Land Uses 000-099)
- Industrial/Agricultural (Land Uses 100-199)
- Residential (Land Uses 200-299)
- Lodging (Land Uses 300-399)
- Recreational (Land Uses 400-499)

ite

Institute of Transportation Engineers

# Trip Generation, 6th Edition

An Informational Report of the
Institute of Transportation Engineers

## Volume 1 of 3

The Institute of Transportation Engineers (ITE) is an international educational and scientific association of transportation and traffic engineers and other professionals who are responsible for meeting mobility and safety needs. The Institute facilitates the application of technology and scientific principles to research, planning, functional design, implementation, operation, policy development and management for any mode of transportation by promoting professional development of members, supporting and encouraging education, stimulating research, developing public awareness, and exchanging professional information; and by maintaining of a central point of reference and action.

Founded in 1930, the Institute serves as a gateway to knowledge and advancement through meetings, seminars, and publications; and through our network of approximately 15,000 members working in some 80 countries. The Institute also has more than 70 local and regional chapters and more than 90 student chapters that provide additional opportunities for information exchange, participation and networking.

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# Single-Family Detached Housing
## (210)

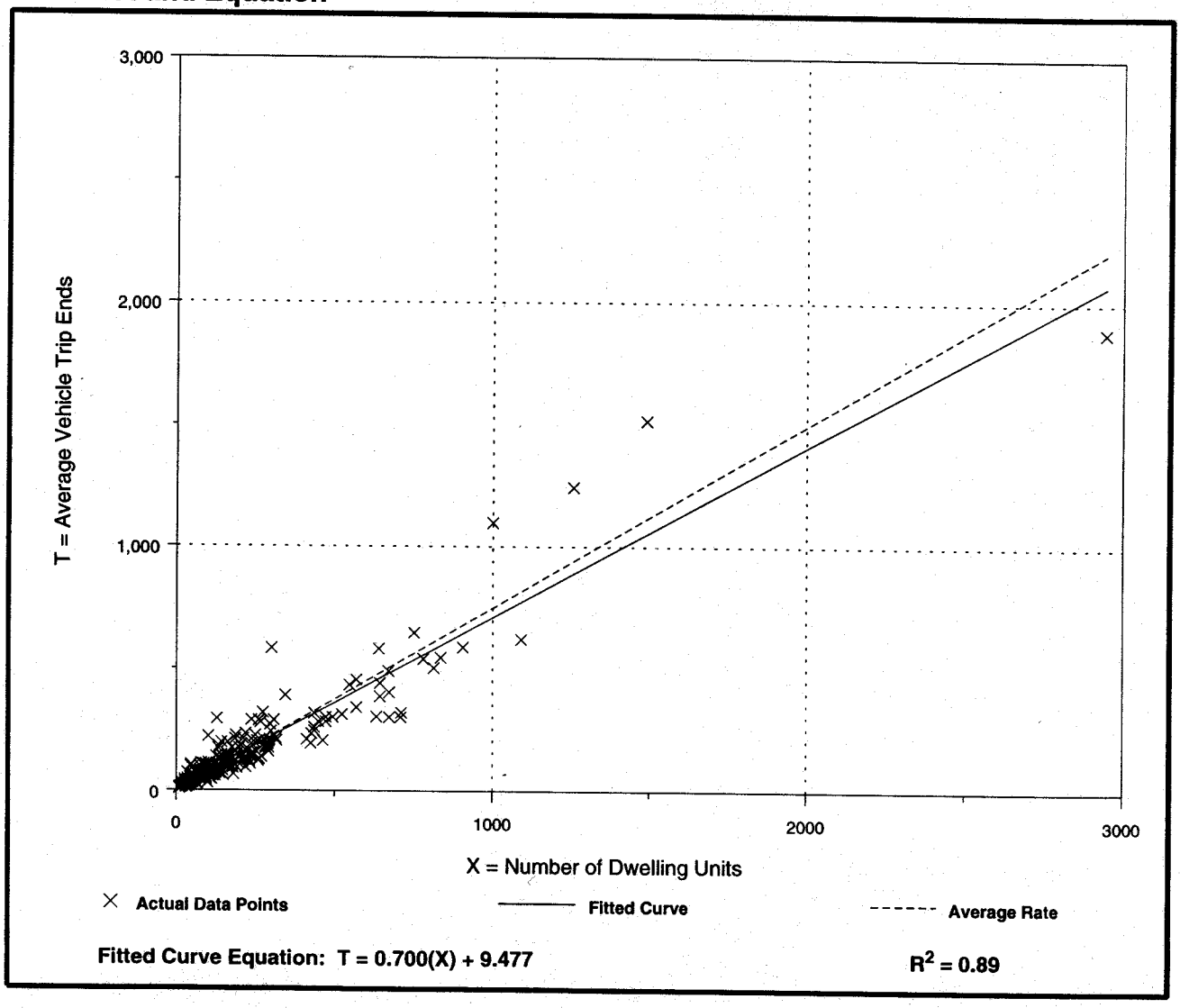
**Average Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**

Number of Studies: 271
Avg. Number of Dwelling Units: 202
Directional Distribution: 25% entering, 75% exiting

### Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.75 | 0.33 - 2.27 | 0.90 |

### Data Plot and Equation




**Fitted Curve Equation: T = 0.700(X) + 9.477**

**$R^2$ = 0.89**

# Land Use: 210
# Single-Family Detached Housing

## Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

## Additional Data

The peak hour of the generator typically coincides with the peak hour of the adjacent street traffic.

The sites were surveyed from the late 1960s to the mid-1990s throughout the United States and Canada.

The number of vehicles and the number of residents have a high correlation with average weekday vehicle trip ends. The use of these variables is limited, however, because the number of vehicles and residents is often difficult to obtain or predict. The number of dwelling units is generally used as the independent variable of choice because it is usually readily available, easy to project, and has a high correlation with average weekday vehicle trip ends.

This land use includes data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there is a wide variation in trips generated within this category. As expected, dwelling units that were larger in size, more expensive, or farther away from the central business district (CBD) had a higher rate of trip generation per unit than those smaller in size, less expensive, or closer to the CBD. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units have the highest trip generation rate per dwelling unit of all residential uses, because they are the largest units in size and have more residents and more vehicles per unit than other residential land uses; they are generally located farther away from shopping centers, employment areas, and other trip attractors than are other residential land uses; and they generally have fewer alternate modes of transportation available, because they are typically not as concentrated as other residential land uses.

## Source Numbers

1, 4, 5, 6, 7, 8, 11, 12, 13, 14, 16, 19, 20, 21, 26, 34, 35, 36, 38, 40, 71, 72, 84, 91, 98, 100, 105, 108, 110, 114, 117, 119, 157, 167, 177, 187, 192, 207, 211, 246, 275, 283, 293, 300, 319, 320, 357, 384, 435

# Single-Family Detached Housing
(210)

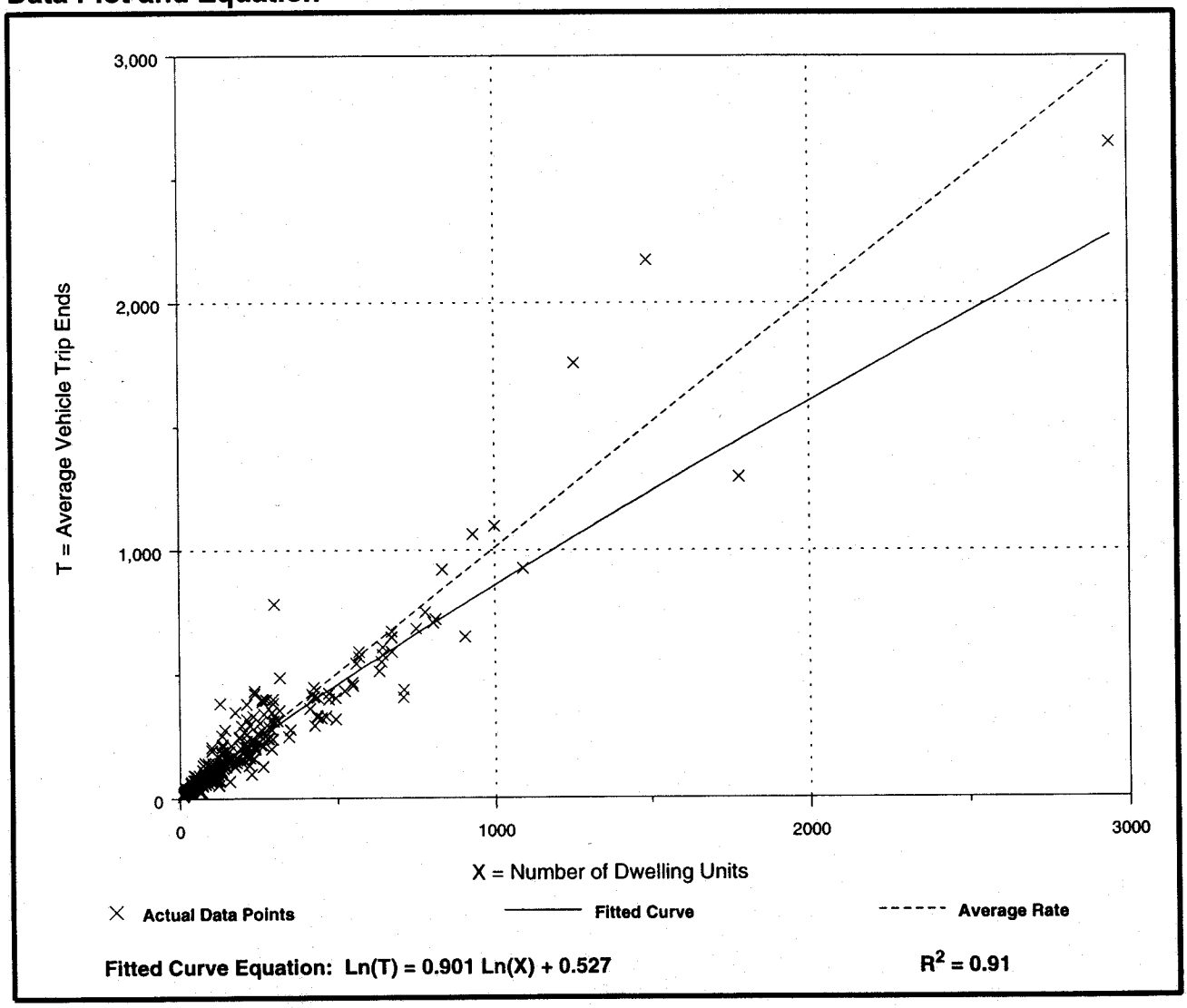
**Average Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**

Number of Studies: 294
Avg. Number of Dwelling Units: 216
Directional Distribution: 64% entering, 36% exiting

## Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 1.01 | 0.42 - 2.98 | 1.05 |

## Data Plot and Equation




**Fitted Curve Equation: Ln(T) = 0.901 Ln(X) + 0.527**

**$R^2$ = 0.91**

# Single-Family Detached Housing
# (210)

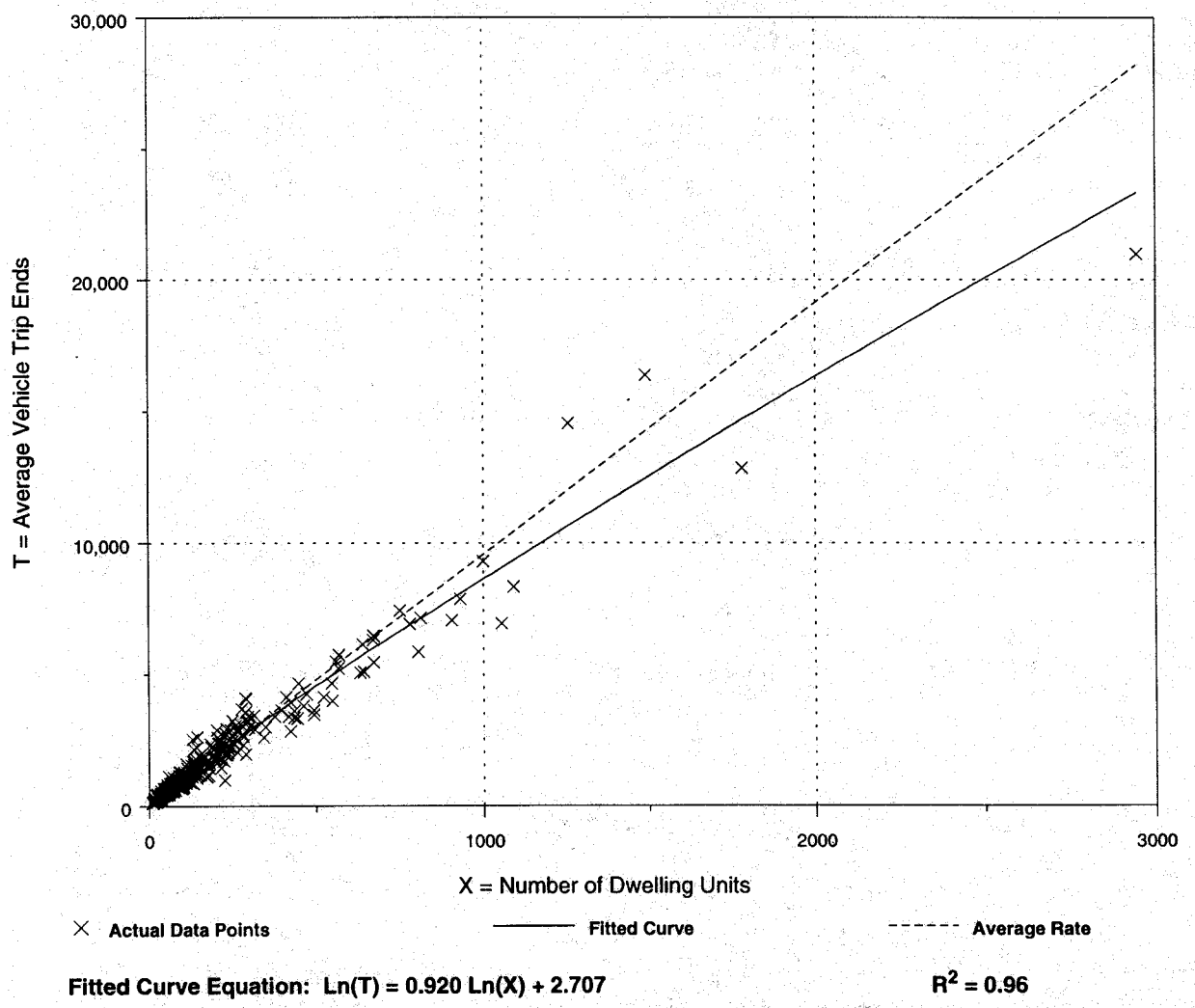
**Average Vehicle Trip Ends vs: Dwelling Units**
**On a: Weekday**

Number of Studies: 348
Avg. Number of Dwelling Units: 198
Directional Distribution: 50% entering, 50% exiting

## Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 9.57 | 4.31 - 21.85 | 3.69 |

## Data Plot and Equation




**Fitted Curve Equation: Ln(T) = 0.920 Ln(X) + 2.707**

**$R^2$ = 0.96**

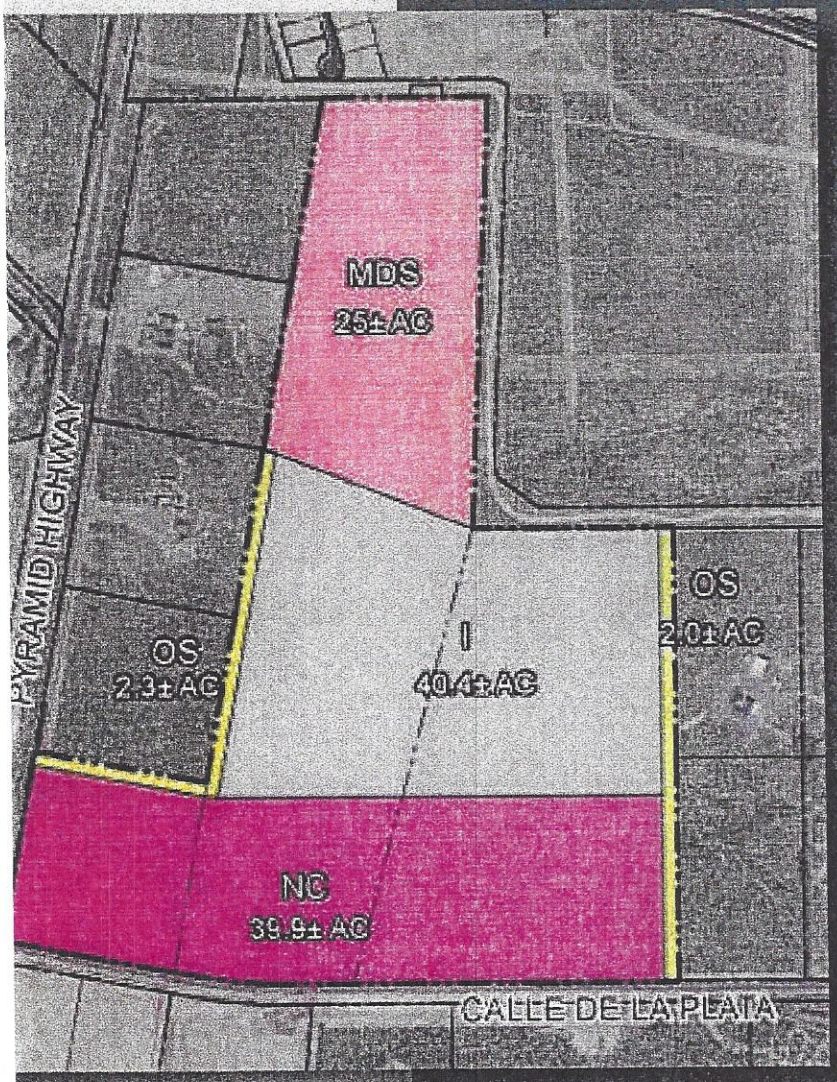
# APPENDIX F:

# VILLAGE AT THE PEAK TRAFFIC IMPACT STUDY

# (FEHR & PEERS, AUGUST 2009)

STAR CONSULTING

# VILLAGE AT THE PEAK
## *TRAFFIC IMPACT STUDY*




Submitted to: **Village at the Peak**

Submitted by: **Fehr & Peers**
50 W. Liberty Street, Suite 301
Reno, NV 89501

**August 2009**

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# EXECUTIVE SUMMARY

This study evaluates the potential traffic impacts of the proposed Village at the Peak zoning amendment in northern Spanish Springs on the nearby roadway system.

## PROJECT DESCRIPTION

The Village at the Peak site is located on the northeast quadrant of the Calle de la Plata/Pyramid Highway intersection in Washoe County, Nevada. The proposed zoning consists of single family residential, neighborhood commercial, and industrial land uses.

## PROJECT ACCESS

Two driveways are proposed to serve the Village at the Peak site. Driveway A and Driveway B are to be located on Calle de la Plata. Driveway A was analyzed as a four leg, two lane roundabout intersection, and Driveway B was analyzed as a three leg, side-street stop controlled intersection.

## STUDY INTERSECTIONS AND SCENARIOS

The following study intersections were analyzed consistent with previous studies of this site:

- Calle de la Plata/Pyramid Highway
- Calle de la Plata/Project Driveway A (plus project conditions only)
- Calle de la Plata/Project Driveway B (plus project conditions only)

AM and PM weekday peak hour intersection level of service was analyzed for the following conditions:

- Existing Conditions
- 2018 Background Conditions
- 2018 Background Plus Project Conditions

Daily roadway segment level of service was analyzed for the following conditions:

- 2018 Background Conditions and 2018 Background Plus Project Conditions
- 2040 Background Conditions and 2040 Background Plus Project Conditions

## EXISTING CONDITIONS

AM and PM weekday peak hour intersection turning movement volumes were collected in August 2008 and used to analyze intersection level of service. The Calle de la Plata/Pyramid Highway intersection currently operates at LOS F during the AM and PM peak hours.

## PROJECT CONDITIONS

The estimated trip generation for the proposed Village at the Peak zoning is 6,190 daily, 662 AM peak hour, and 877 PM peak hour vehicle trips. Internal capture and pass-by reductions are included in the trip generation estimate.

## EXISTING PLUS PROJECT CONDITIONS

The Calle de la Plata/Pyramid Highway intersection operates at LOS F under existing plus project conditions without planned regional roadway improvements. The Calle de la Plata/Driveway A and Calle de la Plata/Driveway B intersections will operate at acceptable levels of service with side-street stop controls.

## 2018 BACKGROUND CONDITIONS

2018 background condition intersection turning movement volumes include regional growth and trips generated by the following project in the surrounding area:

- Village Green Commercial Center (southeast corner of Pyramid Highway/Calle de la Plata intersection)
- Campo Rico Business Center (north of Calle de la Plata along Pyramid Highway)
- Calle de la Plata Retail Project (northwest corner of Pyramid Highway/Calle de la Plata intersection)

The following planned regional roadway improvements listed in the 2040 RTP were also included in the 2018 background conditions analysis:

- Pyramid Highway – Widen from two lanes to four lanes, from Egyptian Drive to Calle de la Plata
- Pyramid Highway – Widen from two lanes to four lanes, from Calle de la Plata to Winnemucca Ranch Road
- Pyramid Highway – Widen from four lanes to six lanes, from Egyptian Drive to Calle de la Plata

The Spanish Springs Area Plan also recommends a traffic signal at the Calle de la Plata/Pyramid Highway intersection which was included in the analysis.

With planned regional roadway improvements, the Calle de la Plata/Pyramid Highway intersection is expected to operate at LOS C and D during the AM and PM peak hours, respectively.

The Pyramid Highway and Calle de la Plata daily traffic volumes near the project site were compared to the Regional Transportation Commission's (RTC) daily level of service thresholds. The roadway segments will operate at LOS D or better with planned roadway improvements.

## 2018 BACKGROUND PLUS PROJECT CONDITIONS

The Calle de la Plata/Pyramid Highway intersection will operate at LOS D during the AM and PM peak periods under 2018 plus project conditions. The Calle de la Plata/Driveway A was analyzed as a two-lane roundabout and is expected to operate at LOS A during both the AM and PM peak hours. The Calle de la Plata/Driveway B intersection will operate at LOS B and C during the AM and PM peak hours, respectively, with side-street stop control.

The daily roadway segment level of service analysis indicated that the Pyramid Highway and Calle de la Plata roadway segments near the project site will operate at LOS D or better under 2018 plus project conditions.

## 2040 AND 2040 PLUS PROJECT CONDITIONS

The daily roadway segment level of service analysis indicates that Pyramid Highway north and south of Calle de la Plata will operate at LOS F with or without the project unless improvements are made. The Calle de la Plata roadway segments near the project site will operate at acceptable levels of service (LOS C) with planned regional roadway improvements. Pyramid Highway will need to be eight lanes south of Calle de la Plata and six lanes north of Calle de la Plata to operate at acceptable levels of service in the year 2040.

## CONCLUSIONS AND RECOMMENDATIONS

The Calle de la Plata/Pyramid Highway intersection currently operates at LOS F during peak hours due to side street delay. The Spanish Springs Area Plan recognizes a traffic signal will be needed at the Calle de la Plata/Pyramid Highway intersection to address the current situation.

The 2040 RTP also recognizes and includes future regional roadway improvements to increase capacity on Pyramid Highway in the project vicinity. The 2040 RTP specifically indicates the following improvements:

- Pyramid Highway – Widen from two lanes to four lanes, from Egyptian Drive to Calle de la Plata by 2018
- Pyramid Highway – Widen from two lanes to four lanes, from Calle de la Plata to Winnemucca Ranch Road by 2030
- Pyramid Highway – Widen from four lanes to six lanes, from Egyptian Drive to Calle de la Plata by 2030

The 2040 RTP intentionally avoids recommending specific intersection improvements, recognizing that the specific intersection configurations should be determined at the time when the corridor is improved and actual turning movements are known. The RTP projects listed above assume that intersection upgrades will be accomplished with the widenings.

It is important to note this analysis is ultra conservative and comprehensive with regard to Year 2018 future traffic volumes because it assumes that, in addition to background traffic growth, the following projects will be built out:

- Village Green Commercial Center (southeast corner of Pyramid Highway/Calle de la Plata intersection)
- Campo Rico Business Center (north of Calle de la Plata along Pyramid Highway)
- Calle de la Plata Retail Project (northwest corner of Pyramid Highway/Calle de la Plata intersection)

It is highly unlikely that these projects and the subject site could all build out within the next 10 years. A 20 plus year horizon (Year 2030) is more realistic. Additionally, the first two projects above (and this application) are limited to zoning amendments and no specific projects have been proposed.

The 2018 analysis demonstrates adequate regional roadway improvements are planned to accommodate regional growth, the previously approved zoning amendments listed above, and rezoning of the subject site. In the unlikely event all the project sites were to develop by 2018, RTP improvements planned for the 2018 to 2030 timeframe would need to be accelerated. Acceleration of projects is a viable option since regional projects are re-evaluated and prioritized every two years with updates of the RTC's Capital Improvement Program. Furthermore, additional traffic studies will be required as specific projects are proposed within the recently proposed and

approved zoning amendment areas and there will be numerous opportunities to assess the necessary phasing of roadway improvements relative to actual development levels.

Finally, the benefits associated with providing zoning for employment and commercial services in the north Spanish Springs area should not be overlooked. The presence of these land uses closer to the heavy concentration of residential communities in north Spanish Springs will ultimately reduce the number and length of trips on Pyramid Highway south of the study area. The presence of jobs in the northern reaches of Spanish Springs will cause a redistribution or "reversing" of work based trips, and provide a higher utilization of the available roadway capacity.

***Conformance with Spanish Springs Vision and Character Statement***

Policy SS.17.2 of the Spanish Springs Area Plan requires compliance with several traffic related criteria. Our response based on the traffic analysis follows the text for each specific item.

b. A traffic analysis has been conducted that clearly identifies the impact to the adopted level of service within the [unincorporated] Spanish Springs Hydrographic Basin and the improvements likely to be required to maintain/achieve the adopted level of service. This finding may be waived by the Department of Public Works for projects that are determined to have minimal impacts. The Department of Public Works may request any information it deems necessary to make this determination.

   ***RESPONSE: This study demonstrates that acceptable levels of service can maintained on the regional roadway system.***

e. If the proposed intensification will result in a drop below the established policy level of service for transportation (as established by the Regional Transportation Commission and Washoe County) within the Spanish Springs Hydrographic Basin, the necessary improvements required to maintain the established level of service are scheduled in either the Washoe County Capital Improvements Program or Regional Transportation Improvement Program within three years of approval of the intensification. For impacts to regional roads, this finding may be waived by the Washoe County Planning Commission upon written request from the Regional Transportation Commission.

   ***RESPONSE: This study discusses the potential impacts and timing of improvements outlined in the RTC's 2040 Regional Transportation Plan (2040 RTP).***

f. If roadways impacted by the proposed intensification are currently operating below adopted levels of service, the intensification will not require infrastructure improvements beyond those articulated in Washoe County and Regional transportation plans AND the necessary improvements are scheduled in either the Washoe County Capital Improvements Program or Regional Transportation Improvement Program within three years of approval of the intensification.

   ***RESPONSE: The improvements necessary to accommodate regional traffic flows and this project can be timed appropriately to avoid adverse traffic impacts.***

# 1. INTRODUCTION

This study evaluates the potential traffic impacts of the proposed Village at the Peak zoning amendment in northern Spanish Springs on the nearby roadway system.

## PROJECT DESCRIPTION

The Village at the Peak site is located on the northeast quadrant of the Calle de la Plata/Pyramid Highway intersection in Washoe County, Nevada. The proposed zoning consists of single family residential, neighborhood commercial, and industrial land uses.

The proposed project site location is shown on **Figure 1** and the zoning land use plan is shown on **Figure 3**.

## SCOPE OF STUDY

Consistent with the previous traffic impact report for this project site, the following intersections were studied:

- Calle de la Plata/Pyramid Highway
- Calle de la Plata/Project Driveway A (plus project conditions only)
- Calle de la Plata/Project Driveway B (plus project conditions only)

## STUDY CONDITIONS

The following six conditions were analyzed for this study with the corresponding volumes and roadway network configurations indicated:

1. Existing Conditions – Intersection level of service analysis was performed for the AM and PM peak periods using intersection turning movement counts collected in August 2008.
2. Existing Plus Project Conditions - Intersection level of service analysis was performed for the AM and PM peak periods using existing volumes plus the addition of project generated traffic volumes.
3. 2018 Background Conditions – 2018 background conditions analysis included regional growth plus trip generation volumes from any planned/approved projects in the area. Daily roadway, and AM and PM peak hour intersection level of service analysis was performed.
4. 2018 Background Plus Project Conditions – Daily roadway, and AM and PM intersection level of service analysis was performed using 2018 background volumes plus the addition of project generated traffic volumes.
5. 2040 Background Conditions – 2040 background conditions analysis included regional growth plus trip generation volumes from any planned/approved projects in the area. Daily roadway segment level of service analysis was performed.
6. 2040 Background Plus Project Conditions – Daily roadway segment level of service analysis was performed using 2040 background volumes plus the addition of project generated traffic volumes.

## INTERSECTION ANALYSIS METHODOLOGY

Transportation engineers and planners commonly use the term level of service (LOS) to measure and describe the operational status of the local roadway network. An intersection or roadway segment's level of service can range from LOS A (indicating free-flow traffic conditions with little or no delay), to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays).

The analysis methods presented in the Transportation Research Board's *Highway Capacity Manual 2000* (*HCM 2000*) were used to calculate LOS for signalized and unsignalized intersections.

### *Signalized Intersections*

Signalized intersections were analyzed using the methodology contained in HCM 2000. This methodology determines the level of service by comparing the average control delay for all vehicles approaching the intersection to the delay thresholds shown in **Table 1**.

### *Unsignalized Intersections*

Unsignalized (side-street stop-controlled) intersection level of service calculations were conducted using the methods contained in Chapter 17 of HCM 2000. The LOS rating is based on the average control delay expressed in seconds per vehicle. At side-street stop-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and for the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. **Table 1** presents the thresholds for unsignalized intersections.

**TABLE 1**
**INTERSECTION LEVEL OF SERVICE DEFINITIONS**

| Level of Service | Description | Signalized Intersections (Average Control Delay) [1] | Unsignalized Intersections (Average Control Delay) [2] |
|---|---|---|---|
| A | Represents free flow. Individual users are virtually unaffected by others in the traffic stream. | ≤ 10 | ≤10 |
| B | Stable flow, but the presence of other users in the traffic stream begins to be noticeable. | > 10 to 20 | > 10 to 15 |
| C | Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream. | > 20 to 35 | > 15 to 25 |
| D | Represents high-density, but stable flow. | > 35 to 55 | > 25 to 35 |
| E | Represents operating conditions at or near the capacity level. | > 55 to 80 | > 35 to 50 |
| F | Represents forced or breakdown flow. | > 80 | > 50 |

Sources:
[1] *HCM 2000*, Chapter 16, Signalized Intersections. Values shown are in seconds/vehicle.
[2] *HCM 2000*, Chapter 17, Unsignalized Intersections. Values shown are in seconds/vehicle.

## LEVEL OF SERVICE STANDARDS

The Washoe County Regional Transportation Commission (RTC) has established level of service criteria for regionally significant roadways and intersections in the *2040 Regional Transportation Plan* (2040 RTP). The 2040 RTP level of service standards for regional roadways and intersections are as follows:

- 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 or more ADT 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.

The Nevada Department of Transportation (NDOT) maintains a policy of LOS D or better on their facilities.

Since Pyramid Highway is an NDOT facility, LOS D or better was used as the standard for this analysis. Any intersections or roadway segments that degrade from LOS A, B, C, or D to LOS E or F shall be considered an impact.

**Table 2** presents the level of service thresholds for roadway segments as established in the 2040 RTP.

**TABLE 2**
**RTC AVERAGE DAILY TRAFFIC ROADWAY LEVEL OF SERVICE THRESHOLDS BY FACILITY TYPE**

| 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 (HAC)** | | | | | |
| 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 (MAC)** | | | | | |
| 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 – Low Access Control (LAC)** | | | | | |
| 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 – Ultra-Low Access Control (ULAC)** | | | | | |
| 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 |
| **Arterial – Ultra-Low Access Control (ULAC)** | | | | | |
| 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 |
| **Collector – Ultra-Low Access Control (ULAC)** | | | | | |
| 2 | n/a | n/a | 7,300 | 8,500 | 9,100 |

* Contact the RTC Planning Department for LOS threshold for collector facilities with access controls other than ultra-low access control.
Source: Washoe County 2040 Regional Transportation Plan, RTC

# 2. EXISTING CONDITIONS

This chapter describes the transportation characteristics of the project study area including area roadways, existing traffic volumes, and existing bicycle, pedestrian and transit facilities.

## ROADWAY SYSTEM

*Pyramid Highway* is a north-south NDOT facility that runs from Interstate 80 (I-80) in the south to Pyramid Lake in the north. Pyramid Highway is a two-lane roadway with posted speed limits of 55 – 65 miles per hour (mph) in the vicinity of the project. The 2040 RTP classifies Pyramid Highway as a High Access Control (HAC) Arterial south of Calle de la Plata and a Moderate Access Control (MAC) Arterial north of Calle de la Plata.

*Calle de la Plata is* a four-lane roadway west of Pyramid Highway and a two-lane roadway east of Pyramid Highway. The 2040 RTP lists Calle de la Plata as a Low Access Control (LAC) Collector west of Pyramid Highway.

## EXISTING TRAFFIC VOLUMES AND LEVEL OF SERVICE

Intersection turning movement counts were collected at the Calle de la Plata/Pyramid Highway intersection during the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak periods in August 2008. The existing volumes, shown on **Figure 2,** were used to analyze the level of service at the study intersection. **Table 3** displays the results. Detailed intersection LOS calculation worksheets are provided in **Appendix A**.

TABLE 3
EXISTING CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

| Intersection | Control Type [1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay [2] | LOS | Delay | LOS |
| Calle de la Plata/Pyramid Highway | SSSC | 10 (>50) | A (F) | 10 (>50) | A (F) |

Notes: [1] SSSC = Side Street Stop Control
[2] Delay is reported in seconds per vehicle for the overall intersection (worst movement) for unsignalized intersections.
**Bold** indicates deficient operations.
Source: Fehr & Peers, 2008

As shown in Table 3 the Calle de la Plata/Pyramid Highway side street approaches operates at LOS F during the AM and PM peak hours. The overall intersection is shown to operate at LOS A.

## TRANSIT, BICYCLE, AND PEDESTRIAN FACILITIES

No existing or planned transit routes access Pyramid Highway or Calle de la Plata in the vicinity of the project. Bike lanes and sidewalks are present on Calle de la Plata west of Pyramid Highway.

# 3. PROJECT CONDITIONS

## PROJECT DESCRIPTION

The project site is currently zoned for 25 acres of Low Density Suburban (LDS) and approximately 85 acres of General Rural land use. Under the existing zoning 27 single family residential housing units are allowed.

The proposed land use plan includes the following zonings:

- 4.3 acres of Open Space.
- 25 acres of Medium Density Suburban (MDS) containing 75 single family residences.
- 40.4 acres for Industrial use.
- 39.9 acres of Neighborhood Commercial.

It is important to note that the current application is for a zoning amendment only. There is no specific project or land use mix proposed at this time. In order to estimate project trips and potential impacts we considered a range of possible specific land uses that would fit within the proposed zonings and have provided our best estimate of future development potential. Additional traffic studies will be prepared with future project specific applications.

The proposed land use plan is included as **Figure 3**.

Two driveways are proposed to serve the Village at the Peak site. Both Driveway A and B are proposed to be located on Calle de la Plata east of Pyramid Highway. Driveway A is recommended to consist of a four legged, two-lane roundabout, and Driveway B is recommended to consist of a three legged, side-street stop controlled intersection. Driveway A could also serve the Village Green Commercial Center located on the south side of Calle de la Plata.

There is a possibility that an additional access could eventually be created to the north (to Horizon Hills Drive through the adjacent subdivision) or west to Pyramid Highway via an easement. Either alternative would require agreements with adjacent land owners, which have not been pursued since this is only a zoning request. This traffic study takes a conservative approach and assumes only the driveways on Calle de la Plata.

## TRIP GENERATION

Trips were generated for the proposed project based on average trip rates in *Trip Generation* (Institute of Transportation Engineers (ITE), Seventh Edition, 2003). Adjustments were made consistent with ITE methodologies to account for internally captured trips (trips between different land uses within the project site) and pass-by trips. Pass-by trips are trips made as intermediate stops to a final destination, for example, a driver who stops at the proposed project on the way home from work. Neither internally captured trips or pass-by trips add new traffic to the roadway network.

The proposed zonings for Village at the Peak will create a mixed-use project. As noted above, in order to perform traffic analysis, we have assumed a land use mix for the site based on the types of services that would be likely and reasonable in this area. These estimations will be revisited with project specific applications.

The assumed land use mix for the 39.9 acre Neighborhood Commercial area is as follows:

- 10 acres of typical shopping center retail
- 10 acres of commercial and civic uses allowed within the Neighborhood Commercial (NC) zone. This area could include services such as a veterinarian hospital, adult care/nursing home, church, health club, bowling alley, copy/print/ship store, nursery, or a tire store for example.
- 20 acres of general office buildings

Based on the broad variety of land uses likely on this site including jobs, housing, retail, and support services, we estimate that approximately 22% of the trips generated by the project will be internally captured. This figure is consistent with documented studies of mixed-use projects and well within the range of 20%-30% internal capture typically found in smaller scale mixed-use developments.

Based on the ITE trip generation handbook, 34% of the trips generated by the commercial/retail uses will be "pass-by" trips.

Since the proposed action is a zoning amendment, and this study analyzes the potential impacts resulting from an amendment, trip generation for the existing zoning has been subtracted to show the difference in traffic levels.

The projected trip generation is summarized in **Table 4**.

**TABLE 4**
**TRIP GENERATION ESTIMATE**

| Land Use | Units | ITE Code | Daily | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Trips | In | Out | Total | In | Out | Total |
| Single Family Residential | 75 | 210 | **718** | 14 | 42 | **56** | 48 | 28 | **76** |
| Industrial | 40.4 AC | 140 | **1,571** | 249 | 51 | **301** | 74 | 263 | **337** |
| Shopping Center/Retail | 10 AC | 820 | **3,737** | 53 | 34 | **87** | 159 | 166 | **325** |
| Commercial/Civic | 10 AC | * | **2,614** | 192 | 39 | **231** | 93 | 330 | **423** |
| Office | 20 AC | 710 | **2,396** | 280 | 57 | **338** | 71 | 253 | **325** |
| **RAW Trip Generation** | | | **11,035** | 789 | 224 | **1,012** | 446 | 1,040 | **1,485** |
| **Internal Capture** | | | **-2,428** | -173 | -49 | **-223** | -98 | -229 | **-327** |
| **Pass-By Trips** | | | **-2,159** | -83 | -25 | **-108** | -86 | -168 | **-254** |
| **Reduction for Trips Allowed by Existing Zoning** | | | **-258** | -5 | -15 | **-20** | -17 | -10 | **-27** |
| **NET NEW TRIPS** | | | **6,190** | 527 | 135 | **662** | 245 | 632 | **877** |

Notes: * Composite rate based on an average of the eight allowable example land uses listed above.
Source: Fehr and Peers 2009

## TRIP DISTRIBUTION AND ASSIGNMENT

The site-generated trips were distributed to the study intersections based on the location of the site relative to existing and planned development in the study area. There are a number of planned developments and recent

roadway connections along Pyramid Highway between Egyptian Drive and the Pebble Creek residential area that will change travel patterns in the study vicinity. As these projects develop the directional distribution of local trips (and some regional trips) will reverse, creating more balanced flows on Pyramid Highway. The creation of jobs in the northern Spanish Springs area will in fact reduce and better balance regional traffic flow on Pyramid Highway.

The estimated trip distribution for the project site is displayed on **Figure 4** and described below:

- 35% to/from the north on Pyramid Highway
- 45% to/from the south on Pyramid Highway
- 20% to/from the west on Calle de la Plata
- 5% to/from the east on Calle de la Plata

Pass-by trips were routed from Pyramid Highway to the site based on the future trip distribution pattern. Using the above distribution, trips were assigned to the roadway system as shown in **Figure 4**.

# 4. EXISTING PLUS PROJECT CONDITIONS

## EXISTING PLUS PROJECT LEVEL OF SERVICE

Vehicle trips generated by the Village at the Peak land use proposal were distributed to the surrounding roadway network and added to the existing traffic volumes for existing plus project conditions analysis. **Table 5** presents the level of service results. **Figure 5** shows the existing plus project traffic volumes and lane configurations.

**TABLE 5**
**EXISTING PLUS PROJECT CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS**

| Intersection | Control Type[1] | Existing Conditions | | | | Existing Plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | | Delay [2] | LOS | Delay [2] | LOS | Delay [2] | LOS | Delay [2] | LOS |
| Calle de la Plata/ Pyramid Highway | SSSC | 10 (>50) | A (F) | 10 (>50) | A (F) | >50 (>50) | F (F) | >50 (>50) | F (F) |
| Calle de la Plata/ Driveway A | SSSC | -- | -- | -- | -- | 6 (10) | A (A) | 12 (25) | A (D) |
| Calle de la Plata/ Driveway B | SSSC | -- | -- | -- | -- | 6 (9) | A (A) | 7 (11) | A (B) |

Notes: [1] SSSC = Side Street Stop Control, AWSC = All Way Stop Control

[2] Delay is reported in seconds per vehicle for the overall intersection for signalized intersections and the overall intersection (worst approach) for SSSC intersections.

-- Not Applicable

**Bold** indicates deficient operations.

Source: Fehr & Peers, 2009

The Calle de la Plata/Pyramid Highway intersection operates at LOS F with and without the addition of project generated traffic. Driveway A and Driveway B operate at acceptable levels of service with side street stop controls.

A traffic signal is planned at the Calle de la Plata/Pyramid Highway intersection to improve operations to an acceptable level.

# 5. 2018 BACKGROUND CONDITIONS

2018 background conditions analysis includes roadway network and intersection improvements listed in the 2040 RTP, as well traffic volume increases from regional growth and planned/approved zoning amendment and development projects in the area.

## 2018 BACKGROUND TRAFFIC VOLUMES

2018 background traffic volumes were developed using several sources. The initial 2018 background traffic volumes (accounting for regional growth in the area) were extracted from the approved Frear Comprehensive Plan Amendment (also known as Village Green Commercial Center) Traffic Analysis (Solaegui Engineers, 2008) as provided by the RTC's regional travel demand model. Additionally, project generated traffic volumes for the Frear Comprehensive Plan Amendment and two other planned/approved project studies in the area (Campo Rico Business Center Traffic Analysis, Solaegui Engineers, 2008 and Calle de la Plata/Pyramid Highway Retail Project Traffic Impact Study, Fehr & Peers, 2007) were included in the 2018 background traffic volumes.

## ROADWAY NETWORK AND INTERSECTION IMPROVEMENTS BY OTHERS

The 2040 RTP lists regional roadway improvements to be completed by 2018 and 2030. The 2018 planned improvements include widening Pyramid Highway, from Egyptian Drive to Calle de la Plata, from two lanes to four lanes. The 2030 planned improvements include widening Pyramid Highway, from Egyptian Drive to Calle de la Plata, from four lanes to six lanes, and from Calle de la Plata to Winnemucca Ranch Road, from two lanes to four lanes. Considering the magnitude of the planned/approved projects included in the 2018 background conditions analysis, it is highly unlikely that these projects will build out completely in the next ten years. Therefore, this analysis assumes that the 2018 and 2030 improvements will likely be in place by the time the projects are completed. If the projects were to build out by 2018, the 2030 planned improvements could be accelerated to accommodate traffic volumes generated by the projects earlier than expected.

Traffic analyses for the three planned/approved projects listed above all discuss the need for a traffic signal at the Calle de la Plata/Pyramid Highway intersection, as recognized in the Spanish Springs Area Plan. Therefore, under 2018 conditions, the study intersection was analyzed with a traffic signal.

Intersection improvements, including left and right turn pockets, were determined during the 2018 background conditions analysis. Improvements necessary to achieve level of service D or better at the Calle de la Plata/Pyramid Highway intersection were determined with AM and PM peak hour intersection analysis. These improvements would most likely be constructed with the RTP planned widening of Pyramid Highway south of Calle de la Plata before 2018.

**Figure 6** shows the 2018 background traffic volumes and the assumed intersection lane configurations.

## INTERSECTION LEVEL OF SERVICE ANALYSIS

**Table 6** presents the level of service results for 2018 background conditions.

TABLE 6
2018 BACKGROUND CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

| Intersection | Control Type | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| | | Delay [1] | LOS | Delay | LOS |
| Calle de la Plata/Pyramid Highway | Signal | 32 | C | 40 | D |

Notes: [1] Delay is reported in seconds per vehicle for the overall intersection (worst movement) for unsignalized intersections.
Source: Fehr & Peers, 2008

The Calle de la Plata/Pyramid Highway intersection will operate at acceptable levels of service during the AM and PM peak hours with the recommended lane configurations shown in **Figure 6** and the planned widenings.

## 2018 AVERAGE DAILY TRAFFIC VOLUMES

2018 avarage daily traffic (ADT) volumes were developed for the roadway segments adjacent to the project site using the same methodology and sources used to obtain the intersection turning movement volumes previously described.

ADT volumes were compared to the RTC's Average Daily Traffic Roadway Level of Service Thresholds (shown in Table 2 of this report) to determine 2018 roadway segment level of service. The results are shown in **Table 7**.

TABLE 7
2018 BACKGROUND CONDITIONS ROADWAY SEGMENT CAPACITY RESULTS

| Roadway | Location | Functional Classification [1] | Lanes | Daily Two-Way Traffic Volume | LOS |
|---|---|---|---|---|---|
| Pyramid Highway | South of Calle de la Plata | HAC Arterial | 6 | 37,000 | C |
| Pyramid Highway | North of Calle de la Plata | MAC Arterial | 4 | 24,500 | C |
| Calle de la Plata | West of Pyramid Highway | ULAC Arterial | 4 | 10,550 | C |
| Calle de la Plata | East of Pyramid Highway | ULAC Arterial | 4 | 7,550 | C |

Notes: [1] ULAC = Ultra-Low Access Control, LAC = Low Access Control, MAC = Moderate Access Control, HAC = High Access Control
Source: Fehr & Peers, 2009

All of the study roadway segments will operate within level of service standards under 2018 background conditions.

# 6. 2018 BACKGROUND PLUS PROJECT CONDITIONS

## INTERSECTION LEVEL OF SERVICE ANALYSIS

Project generated traffic volumes were added to the study intersections for 2018 plus project conditions analysis. Based on the previous traffic study for this project, a two-lane roundabout was assumed for Driveway A. The 2018 plus project traffic volumes and lane configurations are shown in **Figure 7**. **Table 8** shows the level of service results.

**TABLE 8**
**2018 BACKGROUND PLUS PROJECT CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS**

| Intersection | Control Type[1] | 2018 Background Conditions | | | | 2018 Background Plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | | Delay [2] | LOS | Delay [2] | LOS | Delay [2] | LOS | Delay [2] | LOS |
| Calle de la Plata/ Pyramid Highway | Signal | 32 | C | 40 | D | 47 | D | 53 | D |
| Calle de la Plata/ Driveway A | Roundabout | -- | -- | -- | -- | 7 | A | 10 | A |
| Calle de la Plata/ Driveway B | SSSC | -- | -- | -- | -- | 3 (12) | A (B) | 6 (18) | A (C) |

Notes: [1] SSSC = Side Street Stop Control, AWSC = All Way Stop Control
[2] Delay is reported in seconds per vehicle for the overall intersection for signalized intersections and the overall intersection (worst approach) for SSSC intersections.
-- Not Applicable
Source: Fehr & Peers, 2009

The study intersections are expected to operate at acceptable levels of service under 2018 background plus project conditions. A side-street stop control will operate sufficiently at Driveway B.

## DAILY ROADWAY SEGMENT ANALYSIS

Daily trip generation volumes were added to 2018 background volumes for roadway segment level of service analysis. **Table 9** shows the level of service results.

TABLE 9
2018 BACKGROUND PLUS PROJECT CONDITIONS ROADWAY SEGMENT CAPACITY RESULTS

| Roadway | Location | Functional Classification 1 | Lanes | Daily Two-Way Traffic Volume | LOS |
|---|---|---|---|---|---|
| Pyramid Highway | South of Calle de la Plata | HAC Arterial | 6 | 39,500 | C |
| Pyramid Highway | North of Calle de la Plata | MAC Arterial | 4 | 26,650 | C |
| Calle de la Plata | West of Pyramid Highway | ULAC Arterial | 4 | 11,800 | C |
| Calle de la Plata | East of Pyramid Highway | ULAC Arterial | 4 | 7,850 | C |

Notes: [1] ULAC = Ultra-Low Access Control, LAC = Low Access Control, MAC = Moderate Access Control, HAC = High Access Control
Source: Fehr & Peers, 2009

This analysis assumes that Calle de la Plata will have a four-lane section between Pyramid Highway and Driveway B. Two lanes would be sufficient east of Driveway B. All studied roadway segments are shown to operate at acceptable levels of service with the planned improvements.

# 6. 2040 AND 2040 PLUS PROJECT CONDITIONS

2040 daily roadway segment analysis was performed for 2040 background conditions and 2040 background plus project conditions.

## 2040 VOLUME DEVELOPMENT

2040 background traffic volumes were developed using the same methodology and sources used to obtain 2018 background traffic volumes. The initial 2040 background traffic volumes (accounting for regional growth in the area) were extracted from the Village Green Traffic Analysis as provided by the RTC's regional travel demand model. Additionally, project generated traffic volumes for the three projects discussed previously were included in the 2040 background traffic volumes. **Table 10** shows the 2040 background and 2040 background plus project traffic volumes.

**TABLE 10**
**2040 TRAFFIC VOLUME DEVELOPMENT**

| Roadway Segment, Location | | |
|---|---|---|
| **Volume Source (Project)** | **Daily Volume** | **Percent of Total Volume** |
| **Pyramid Highway, South of Calle de la Plata** | | |
| 2040 Background | 50,000 | 72% |
| Village Green Commercial Center | 9,700 | 14% |
| Campo Rico Business Center | 5,400 | 8% |
| Calle de la Plata Retail Center | 1,300 | 2% |
| Village at the Peak | 2,500 | 4% |
| Total | 68,900 | |
| **Pyramid Highway, North of Calle de la Plata** | | |
| 2040 Background | 33,150 | 74% |
| Village Green Commercial Center | 2,250 | 5% |
| Campo Rico Business Center | 5,700 | 13% |
| Calle de la Plata Retail Center | 1,300 | 3% |
| Village at the Peak | 2,150 | 5% |
| Total | 44,550 | |
| **Calle de la Plata, West of Pyramid Highway** | | |
| 2040 Background | 6,400 | 52% |
| Village Green Commercial Center | 2,500 | 20% |
| Campo Rico Business Center | 2,100 | 17% |
| Calle de la Plata Retail Center | 150 | 1% |
| Village at the Peak | 1,250 | 10% |
| Total | 12,400 | |
| **Calle de la Plata, East of Pyramid Highway** | | |
| 2040 Background | 3,900 | 46% |
| Village Green Commercial Center | 3,300 | 39% |
| Campo Rico Business Center | 890 | 10% |
| Calle de la Plata Retail Center | 150 | 2% |
| Village at the Peak | 310 | 3% |
| Total | 8,550 | |

Notes: [1] Delay is reported in seconds per vehicle for the overall intersection (worst movement) for unsignalized intersections.
Source: Fehr & Peers, 2008

**Table 11** shows the daily roadway segment level of service results for 2040 background conditions.

**TABLE 11**
**2040 BACKGROUND CONDITIONS ROADWAY SEGMENT CAPACITY RESULTS**

| Roadway | Location | Functional Classification [1] | Lanes | Daily Two-Way Traffic Volume | LOS |
|---|---|---|---|---|---|
| Pyramid Highway | South of Calle de la Plata | HAC Arterial | 6/8 | 66,400 | F/C |
| Pyramid Highway | North of Calle de la Plata | MAC Arterial | 4/6 | 42,400 | F/C |
| Calle de la Plata | West of Pyramid Highway | ULAC Arterial | 4 | 11,150 | C |
| Calle de la Plata | East of Pyramid Highway | ULAC Arterial | 4 | 8,250 | C |

Notes: [1] ULAC = Ultra-Low Access Control, LAC = Low Access Control, MAC = Moderate Access Control, HAC = High Access Control
Source: Fehr & Peers, 2009

Pyramid Highway north and south of Calle de la Plata is expected to operate at LOS F under 2040 background conditions. Calle de la Plata will operate within level of service standards.

## 2040 BACKGROUND PLUS PROJECT CONDITIONS

Village at the Peak project generated traffic volumes were added to the 2040 background volumes for 2040 background plus project conditions daily roadway segment level of service analysis. **Table 12** shows the results.

**TABLE 12**
**2040 BACKGROUND PLUS PROJECT CONDITIONS ROADWAY SEGMENT CAPACITY RESULTS**

| Roadway | Location | Functional Classification 1 | Lanes | Daily Two-Way Traffic Volume | LOS |
|---|---|---|---|---|---|
| Pyramid Highway | South of Calle de la Plata | HAC Arterial | 6/8 | 68,900 | F/C |
| Pyramid Highway | North of Calle de la Plata | MAC Arterial | 4/6 | 44,550 | F/C |
| Calle de la Plata | West of Pyramid Highway | ULAC Arterial | 4 | 12,400 | C |
| Calle de la Plata | East of Pyramid Highway | ULAC Arterial | 4 | 8,550 | C |

Notes: [1] ULAC = Ultra-Low Access Control, LAC = Low Access Control, MAC = Moderate Access Control, HAC = High Access Control
Source: Fehr & Peers, 2009

Unless improved, Pyramid Highway north and south of Calle de la Plata will operate at LOS F with or without the traffic generated by the proposed project. Calle de la Plata will operate within level of service standards.

2040 daily roadway segment level of service analysis shows that Pyramid Highway will need to be eight lanes south of Calle de la Plata and six lanes north of Calle de la Plata to operate at acceptable levels of service in the year 2040. The 2040 analysis should be considered "planning level" and needs further refinement through future studies.

# 7. CONCLUSIONS AND RECOMMENDATIONS

The Calle de la Plata/Pyramid Highway intersection currently operates at LOS F during peak hours due to side street delay. The Spanish Springs Area Plan recognizes a traffic signal will be needed at the Calle de la Plata/Pyramid Highway intersection to address the current situation.

The 2040 RTP also recognizes and includes future regional roadway improvements to increase capacity on Pyramid Highway in the project vicinity. The 2040 RTP specifically indicates the following improvements:

- Pyramid Highway – Widen from two lanes to four lanes, from Egyptian Drive to Calle de la Plata by 2018
- Pyramid Highway – Widen from two lanes to four lanes, from Calle de la Plata to Winnemucca Ranch Road by 2030
- Pyramid Highway – Widen from four lanes to six lanes, from Egyptian Drive to Calle de la Plata by 2030

The 2040 RTP intentionally avoids recommending specific intersection improvements, recognizing that the specific intersection configurations should be determined at the time when the corridor is improved and actual turning movements are known. The RTP projects listed above assume that intersection upgrades will be accomplished with the widenings.

It is important to note this analysis is ultra conservative and comprehensive with regard to Year 2018 future traffic volumes because it assumes that, in addition to background traffic growth, the following projects will be built out:

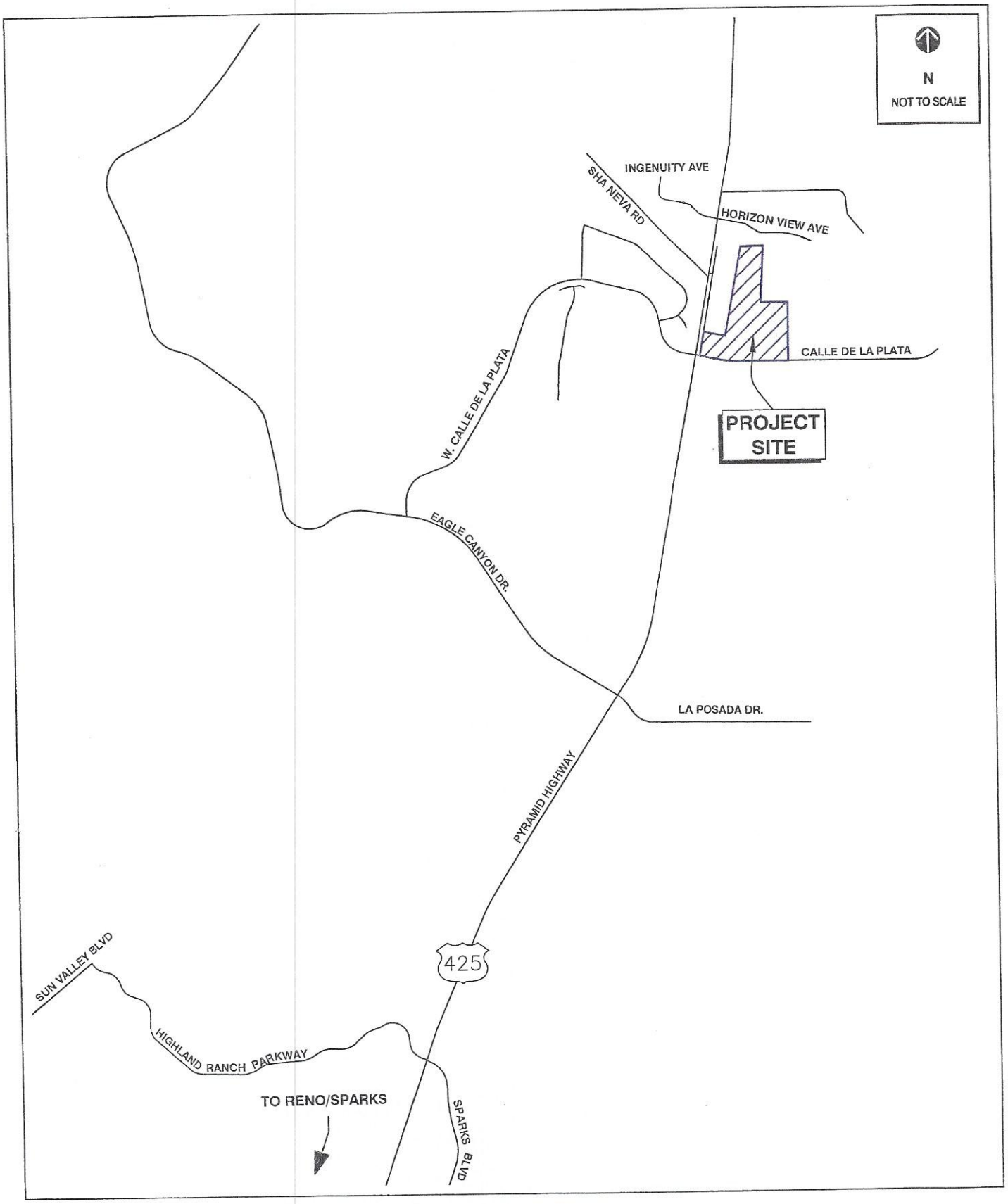
- Village Green Commercial Center (southeast corner of Pyramid Highway/Calle de la Plata intersection)
- Campo Rico Business Center (north of Calle de la Plata along Pyramid Highway)
- Calle de la Plata Retail Project (northwest corner of Pyramid Highway/Calle de la Plata intersection)

It is highly unlikely that these projects and the subject site could all build out within the next 10 years. A 20 plus year horizon (Year 2030) is more realistic. Additionally, the first two projects above (and this application) are limited to zoning amendments and no specific projects have been proposed.

The 2018 analysis demonstrates adequate regional roadway improvements are planned to accommodate regional growth, the previously approved zoning amendments listed above, and rezoning of the subject site. In the unlikely event all the project sites were to develop by 2018, RTP improvements planned for the 2018 to 2030 timeframe would need to be accelerated. Acceleration of projects is a viable option since regional projects are re-evaluated and prioritized every two years with updates of the RTC's Capital Improvement Program. Furthermore, additional traffic studies will be required as specific projects are proposed within the recently proposed and approved zoning amendment areas and there will be numerous opportunities to assess the necessary phasing of roadway improvements relative to actual development levels.

Finally, the benefits associated with providing zoning for employment and commercial services in the north Spanish Springs area should not be overlooked. The presence of these land uses closer to the heavy concentration of residential communities in north Spanish Springs will ultimately reduce the number and length of trips on Pyramid Highway south of the study area. The presence of jobs in the northern reaches of Spanish Springs will cause a redistribution or "reversing" of work based trips, and provide a higher utilization of the available roadway capacity.

# FIGURES

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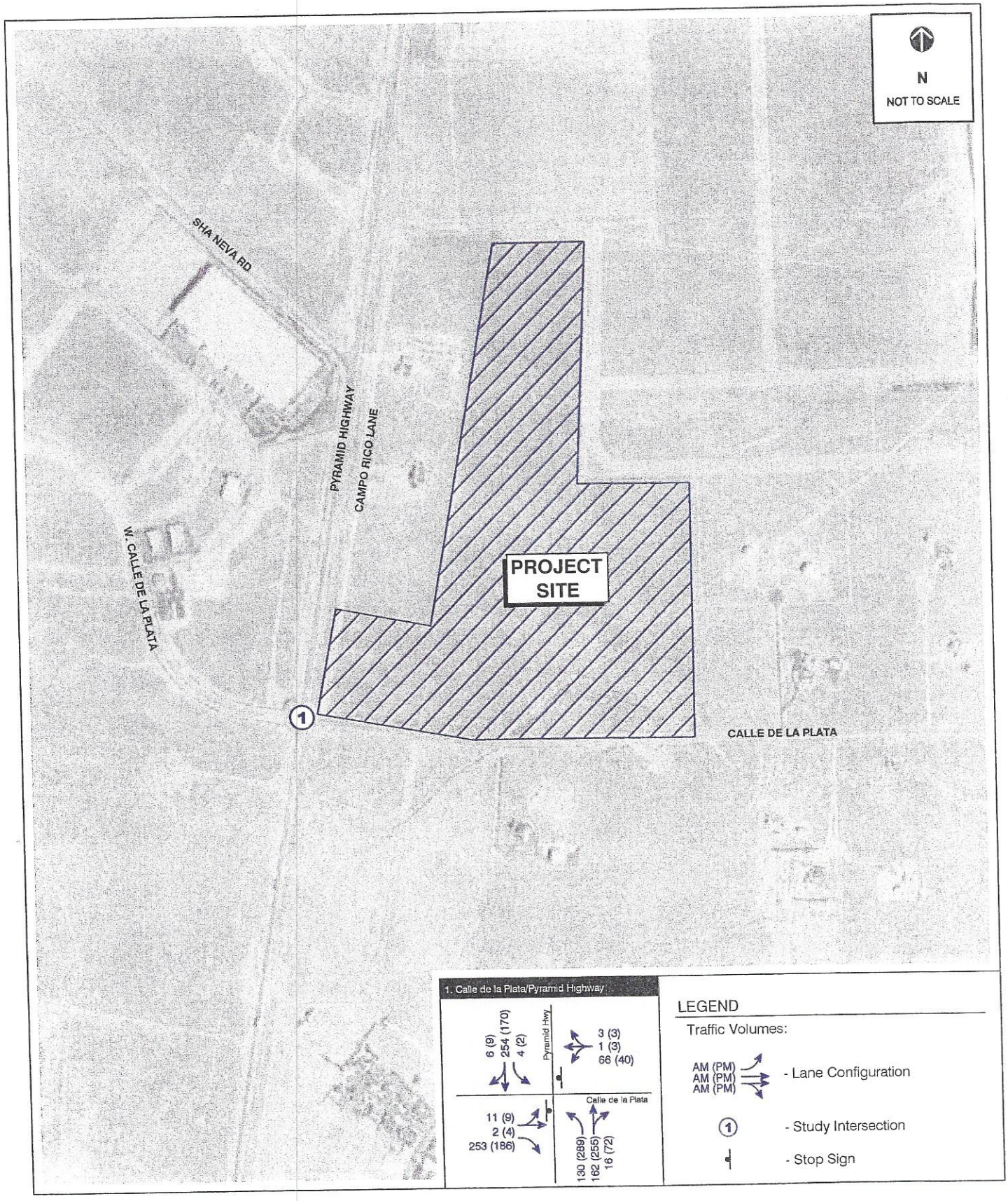
**Village at the Peak**
**Traffic Impact Study**
**Project Location**

Figure 1

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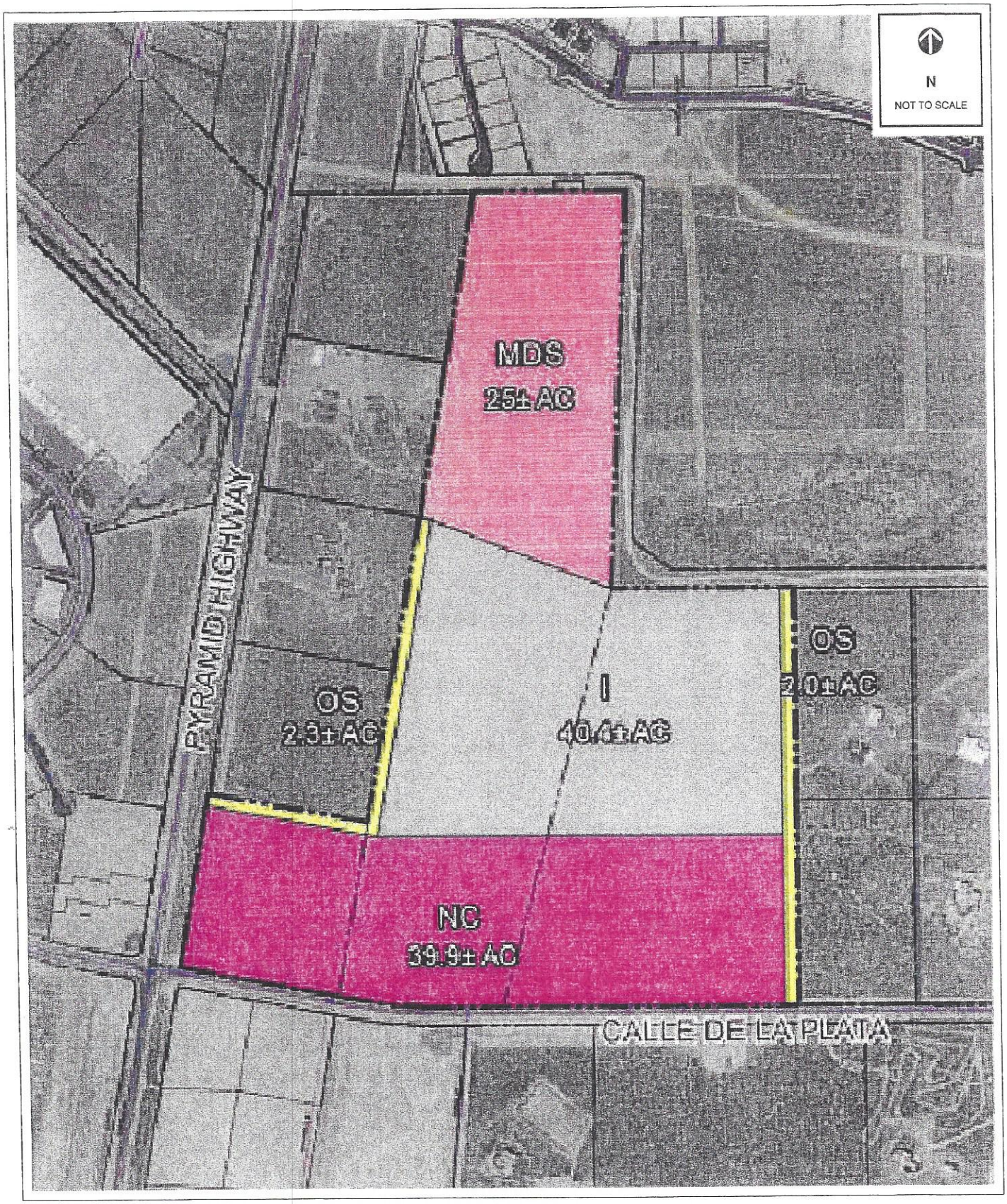
**Village at the Peak**
**Traffic Impact Study**
**Existing Conditions**

Figure 2

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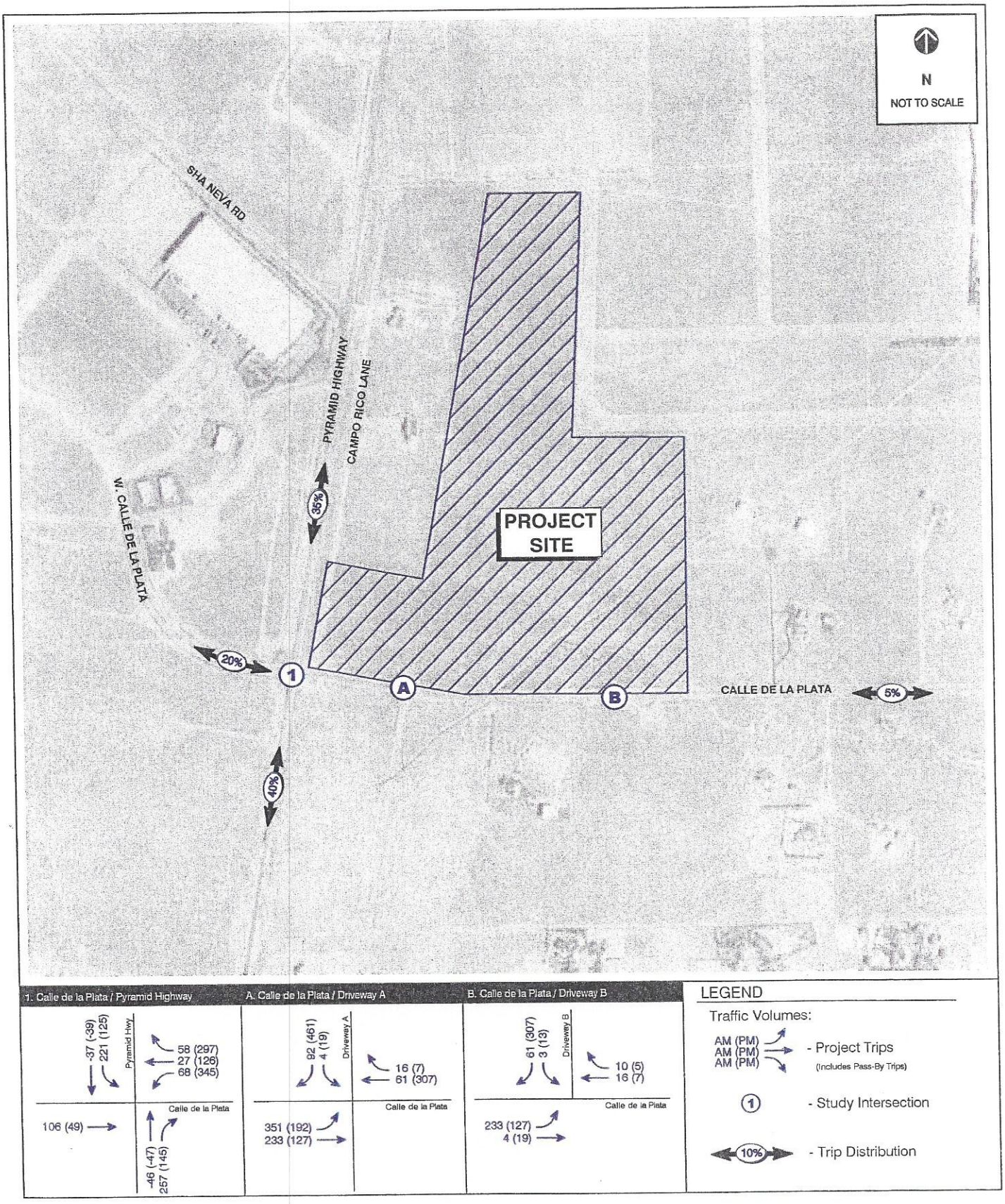
**Village at the Peak**
**Traffic Impact Study**
**Land Use Plan**

Figure 3

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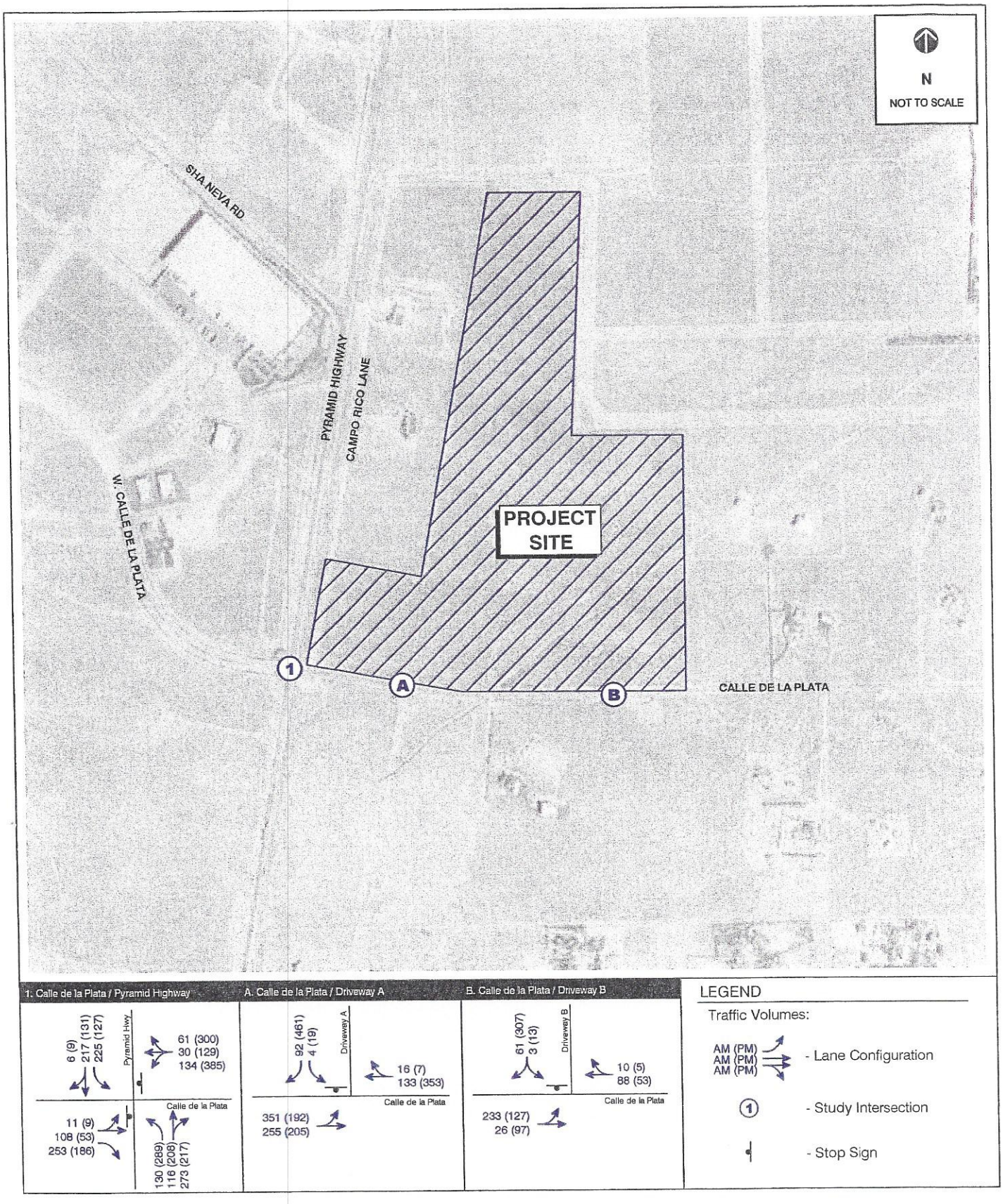
**Village at the Peak**
**Traffic Impact Study**
**Trip Distribution and Assignment**

Figure 4

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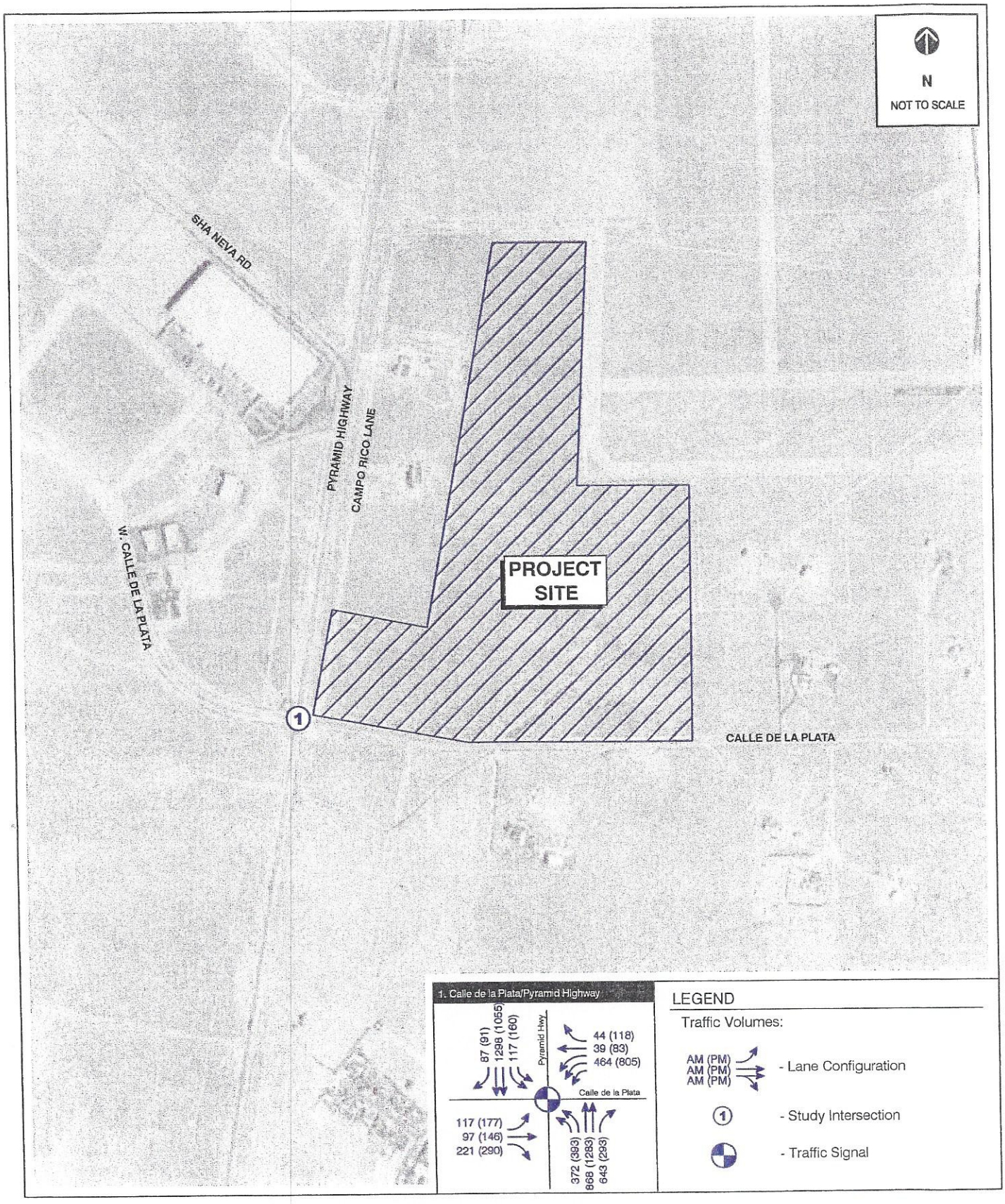
**Village at the Peak**
**Traffic Impact Study**
**Existing Plus Project Conditions**

**Figure 5**

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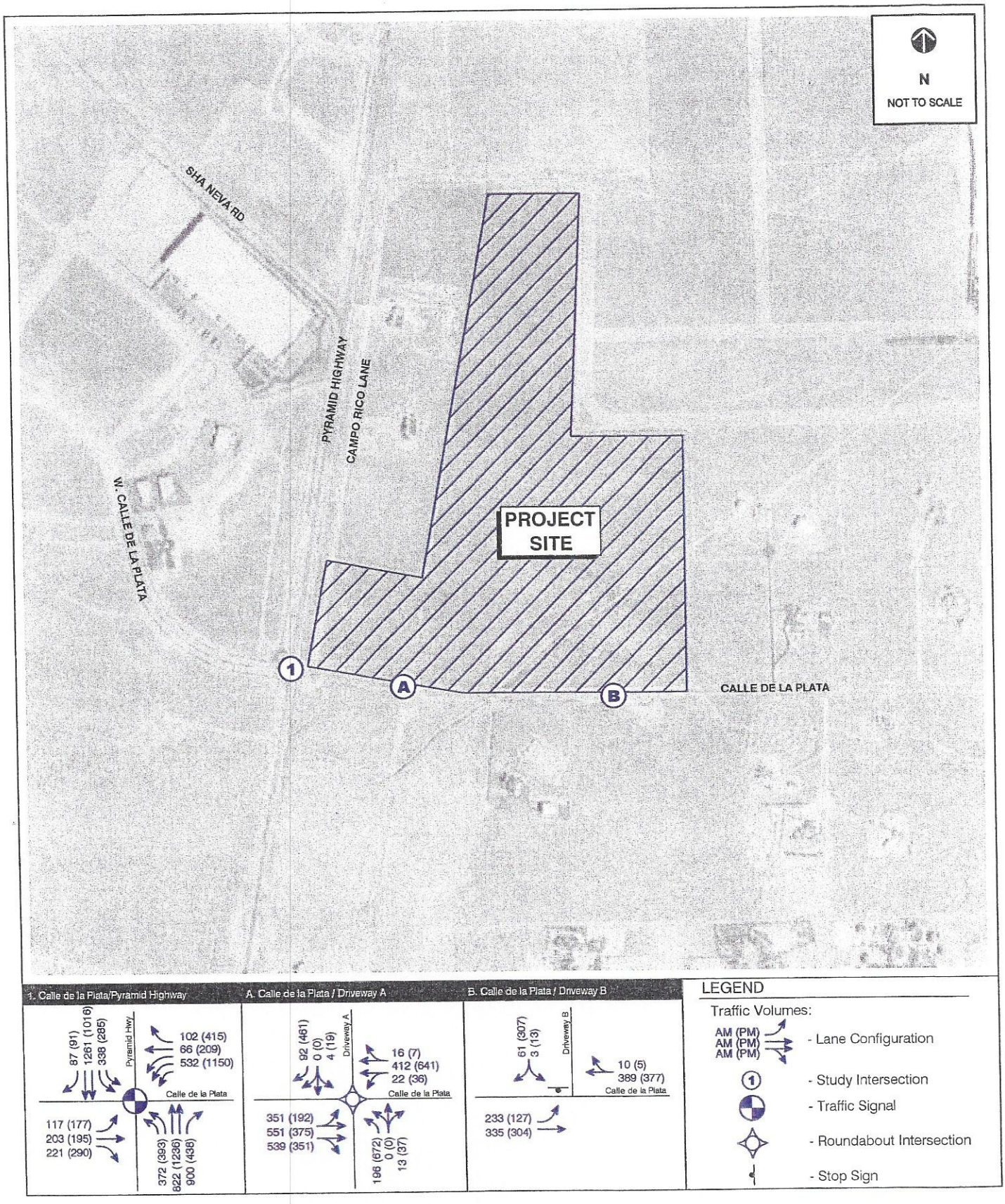
**Village at the Peak**
**Traffic Impact Study**
**2018 Background Conditions**

Figure 6

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**Village at the Peak**
**Traffic Impact Study**
**2018 Plus Project Conditions**

**Figure 7**

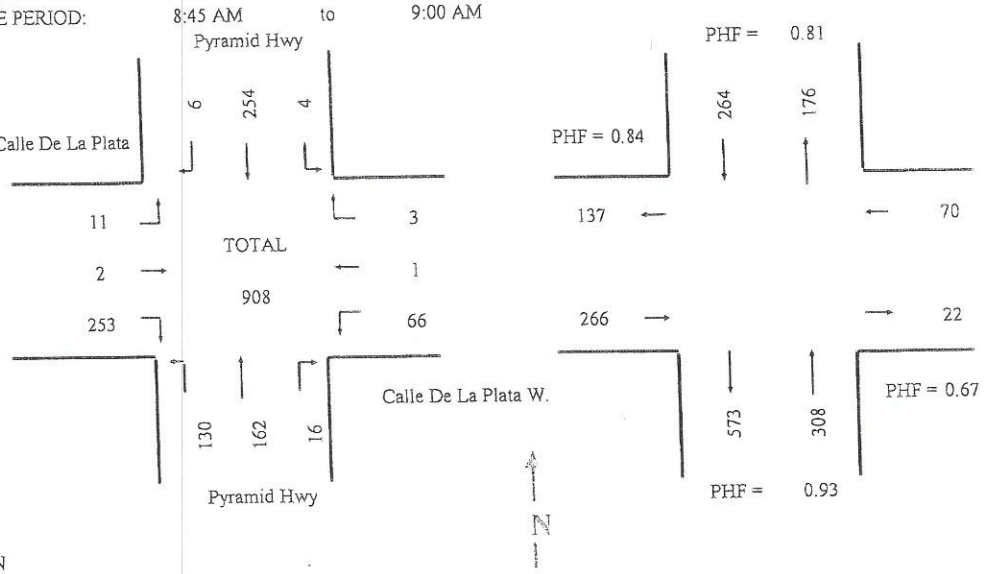
# APPENDIX A:

# INTERSECTION TURNING MOVEMENT DATA

# INTERSECTION TURNING MOVEMENT SUMMARY

| | | | |
|---|---|---|---|
| INTERSECTION: | Calle De La Plata West/Pyramid Hwy | TIME: | 7:00 AM to 9:00 AM |
| JURISDICTION: | | DATE: | Thur 8-21-08 |
| PROJECT TITLE: | Calle De La Plata West | PROJECT NO: | RN08-0405 |

PEAK HOUR PERIOD: 8:00 AM to 9:00 AM
PEAK 15 MINUTE PERIOD: 8:45 AM to 9:00 AM




INTERSECTION PEAK HOUR FACTOR: 0.91

## RUNNING COUNTS

| | Calle De La Plata Eastbound | | | Calle De La Plata W. Westbound | | | Pyramid Hwy Northbound | | | Pyramid Hwy Southbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period End | Left A | Thru B | Right C | Left D | Thru E | Right F | Left G | Thru H | Right I | Left J | Thru K | Right L | TOTAL |
| 7:15 AM | 4 | 1 | 71 | 22 | 1 | 0 | 23 | 36 | 3 | 1 | 65 | 1 | 228 |
| 7:30 AM | 6 | 2 | 147 | 37 | 1 | 0 | 46 | 75 | 8 | 1 | 145 | 5 | 473 |
| 7:45 AM | 11 | 2 | 201 | 50 | 2 | 1 | 75 | 107 | 8 | 2 | 185 | 5 | 649 |
| 8:00 AM | 11 | 2 | 258 | 61 | 2 | 1 | 104 | 145 | 14 | 3 | 240 | 6 | 847 |
| 8:15 AM | 14 | 2 | 302 | 69 | 2 | 2 | 130 | 187 | 18 | 3 | 296 | 7 | 1032 |
| 8:30 AM | 15 | 3 | 364 | 89 | 2 | 4 | 164 | 232 | 22 | 6 | 356 | 8 | 1265 |
| 8:45 AM | 20 | 4 | 434 | 114 | 3 | 4 | 201 | 267 | 26 | 7 | 415 | 10 | 1505 |
| 9:00 AM | 22 | 4 | 511 | 127 | 3 | 4 | 234 | 307 | 30 | 7 | 494 | 12 | 1755 |

## PERIOD COUNTS

| Period End | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7:15 AM | 4 | 1 | 71 | 22 | 1 | 0 | 23 | 36 | 3 | 1 | 65 | 1 | 228 |
| 7:30 AM | 2 | 1 | 76 | 15 | 0 | 0 | 23 | 39 | 5 | 0 | 80 | 4 | 245 |
| 7:45 AM | 5 | 0 | 54 | 13 | 1 | 1 | 29 | 32 | 0 | 1 | 40 | 0 | 176 |
| 8:00 AM | 0 | 0 | 57 | 11 | 0 | 0 | 29 | 38 | 6 | 1 | 55 | 1 | 198 |
| 8:15 AM | 3 | 0 | 44 | 8 | 0 | 1 | 26 | 42 | 4 | 0 | 56 | 1 | 185 |
| 8:30 AM | 1 | 1 | 62 | 20 | 0 | 2 | 34 | 45 | 4 | 3 | 60 | 1 | 233 |
| 8:45 AM | 5 | 1 | 70 | 25 | 1 | 0 | 37 | 35 | 4 | 1 | 59 | 2 | 240 |
| 9:00 AM | 2 | 0 | 77 | 13 | 0 | 0 | 33 | 40 | 4 | 0 | 79 | 2 | 250 |

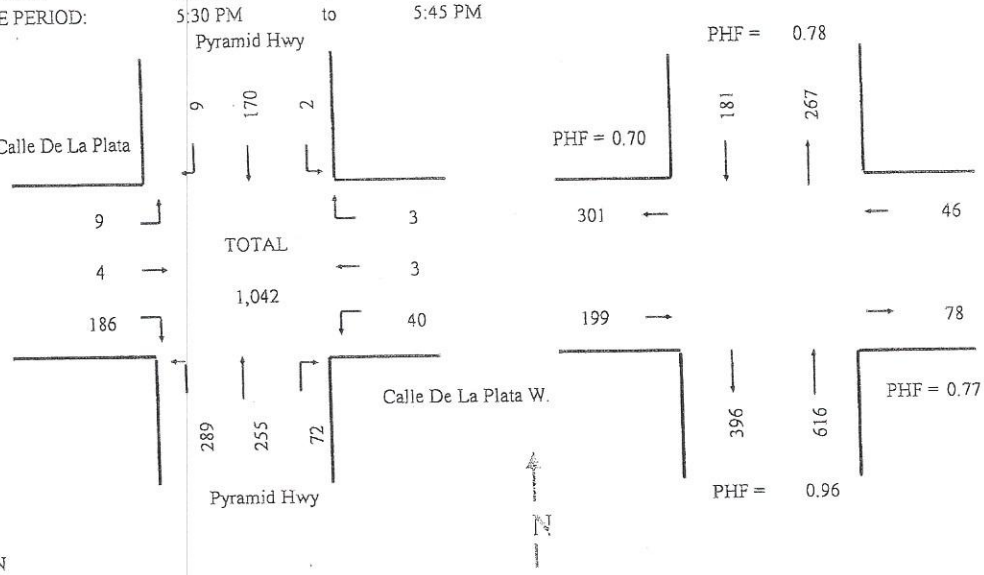
## HOURLY TOTALS

| Beginning At | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7:00 AM | 11 | 2 | 258 | 61 | 2 | 1 | 104 | 145 | 14 | 3 | 240 | 6 | 847 |
| 7:15 AM | 10 | 1 | 231 | 47 | 1 | 2 | 107 | 151 | 15 | 2 | 231 | 6 | 804 |
| 7:30 AM | 9 | 1 | 217 | 52 | 1 | 4 | 118 | 157 | 14 | 5 | 211 | 3 | 792 |
| 7:45 AM | 9 | 2 | 233 | 64 | 1 | 3 | 126 | 160 | 18 | 5 | 230 | 5 | 856 |
| 8:00 AM | 11 | 2 | 253 | 66 | 1 | 3 | 130 | 162 | 16 | 4 | 254 | 6 | 908 |

# INTERSECTION TURNING MOVEMENT SUMMARY

| | | | |
|---|---|---|---|
| INTERSECTION: | Calle De La Plata West/Pyramid Hwy | TIME: | 4:00 PM to 6:00 PM |
| JURISDICTION: | | DATE: | Thur 8-21-08 |
| PROJECT TITLE: | Calle De La Plata West | PROJECT NO: | RN08-0405 |

PEAK HOUR PERIOD: 5:00 PM to 6:00 PM
PEAK 15 MINUTE PERIOD: 5:30 PM to 5:45 PM




INTERSECTION PEAK HOUR FACTOR: 0.87

| RUNNING COUNTS | Calle De La Plata Eastbound | | | Calle De La Plata W. Westbound | | | Pyramid Hwy Northbound | | | Pyramid Hwy Southbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| **Period End** | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
| 4:15 PM | 0 | 0 | 59 | 11 | 2 | 1 | 49 | 64 | 21 | 0 | 29 | 1 | 237 |
| 4:30 PM | 5 | 1 | 100 | 24 | 2 | 1 | 84 | 116 | 35 | 0 | 76 | 4 | 448 |
| 4:45 PM | 6 | 2 | 141 | 29 | 3 | 1 | 128 | 170 | 53 | 0 | 117 | 4 | 654 |
| 5:00 PM | 6 | 4 | 170 | 36 | 3 | 1 | 177 | 214 | 73 | 2 | 146 | 8 | 840 |
| 5:15 PM | 8 | 4 | 223 | 47 | 3 | 3 | 260 | 271 | 92 | 3 | 186 | 10 | 1110 |
| 5:30 PM | 12 | 4 | 255 | 58 | 6 | 4 | 326 | 330 | 106 | 4 | 225 | 15 | 1345 |
| 5:45 PM | 15 | 7 | 320 | 69 | 6 | 4 | 394 | 402 | 124 | 4 | 282 | 16 | 1643 |
| 6:00 PM | 15 | 8 | 356 | 76 | 6 | 4 | 466 | 469 | 145 | 4 | 316 | 17 | 1882 |

| PERIOD COUNTS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Period End** | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
| 4:15 PM | 0 | 0 | 59 | 11 | 2 | 1 | 49 | 64 | 21 | 0 | 29 | 1 | 237 |
| 4:30 PM | 5 | 1 | 41 | 13 | 0 | 0 | 35 | 52 | 14 | 0 | 47 | 3 | 211 |
| 4:45 PM | 1 | 1 | 41 | 5 | 1 | 0 | 44 | 54 | 18 | 0 | 41 | 0 | 206 |
| 5:00 PM | 0 | 2 | 29 | 7 | 0 | 0 | 49 | 44 | 20 | 2 | 29 | 4 | 186 |
| 5:15 PM | 2 | 0 | 53 | 11 | 0 | 2 | 83 | 57 | 19 | 1 | 40 | 2 | 270 |
| 5:30 PM | 4 | 0 | 32 | 11 | 3 | 1 | 66 | 59 | 14 | 1 | 39 | 5 | 235 |
| 5:45 PM | 3 | 3 | 65 | 11 | 0 | 0 | 68 | 72 | 18 | 0 | 57 | 1 | 298 |
| 6:00 PM | 0 | 1 | 36 | 7 | 0 | 0 | 72 | 67 | 21 | 0 | 34 | 1 | 239 |

| HOURLY TOTALS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Beginning At** | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
| 4:00 PM | 6 | 4 | 170 | 36 | 3 | 1 | 177 | 214 | 73 | 2 | 146 | 8 | 840 |
| 4:15 PM | 8 | 4 | 164 | 36 | 1 | 2 | 211 | 207 | 71 | 3 | 157 | 9 | 873 |
| 4:30 PM | 7 | 3 | 155 | 34 | 4 | 3 | 242 | 214 | 71 | 4 | 149 | 11 | 897 |
| 4:45 PM | 9 | 5 | 179 | 40 | 3 | 3 | 266 | 232 | 71 | 4 | 165 | 12 | 989 |
| 5:00 PM | 9 | 4 | 186 | 40 | 3 | 3 | 289 | 255 | 72 | 2 | 170 | 9 | 1042 |

# APPENDIX B:

# EXISTING & EXISTING PLUS PROJECT CONDITIONS TECHNICAL ANALYSIS

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 2 | 253 | 66 | 1 | 3 | 130 | 162 | 16 | 4 | 254 | 6 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 12 | 2 | 278 | 73 | 1 | 3 | 143 | 178 | 18 | 4 | 279 | 7 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 759 | 773 | 282 | 1040 | 767 | 187 | 286 | | | 196 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 759 | 773 | 282 | 1040 | 767 | 187 | 286 | | | 196 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 96 | 99 | 63 | 39 | 100 | 100 | 89 | | | 100 | | |
| cM capacity (veh/h) | 293 | 292 | 756 | 120 | 294 | 855 | 1276 | | | 1377 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 14 | 278 | 77 | 143 | 196 | 4 | 286 |
| Volume Left | 12 | 0 | 73 | 143 | 0 | 4 | 0 |
| Volume Right | 0 | 278 | 3 | 0 | 18 | 0 | 7 |
| cSH | 293 | 756 | 125 | 1276 | 1700 | 1377 | 1700 |
| Volume to Capacity | 0.05 | 0.37 | 0.61 | 0.11 | 0.12 | 0.00 | 0.17 |
| Queue Length 95th (ft) | 4 | 42 | 78 | 9 | 0 | 0 | 0 |
| Control Delay (s) | 17.9 | 12.5 | 71.3 | 8.2 | 0.0 | 7.6 | 0.0 |
| Lane LOS | C | B | F | A | | A | |
| Approach Delay (s) | 12.8 | | 71.3 | 3.5 | | 0.1 | |
| Approach LOS | B | | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 10.4 | | |
| Intersection Capacity Utilization | 43.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 9 | 4 | 186 | 40 | 3 | 3 | 289 | 255 | 72 | 2 | 170 | 9 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 10 | 5 | 214 | 46 | 3 | 3 | 332 | 293 | 83 | 2 | 195 | 10 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1168 | 1245 | 201 | 1415 | 1209 | 334 | 206 | | | 376 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1168 | 1245 | 201 | 1415 | 1209 | 334 | 206 | | | 376 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 92 | 96 | 75 | 32 | 98 | 100 | 76 | | | 100 | | |
| cM capacity (veh/h) | 135 | 131 | 840 | 68 | 138 | 707 | 1366 | | | 1183 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 15 | 214 | 53 | 332 | 376 | 2 | 206 |
| Volume Left | 10 | 0 | 46 | 332 | 0 | 2 | 0 |
| Volume Right | 0 | 214 | 3 | 0 | 83 | 0 | 10 |
| cSH | 134 | 840 | 75 | 1366 | 1700 | 1183 | 1700 |
| Volume to Capacity | 0.11 | 0.25 | 0.71 | 0.24 | 0.22 | 0.00 | 0.12 |
| Queue Length 95th (ft) | 9 | 25 | 82 | 24 | 0 | 0 | 0 |
| Control Delay (s) | 35.2 | 10.7 | 127.8 | 8.5 | 0.0 | 8.1 | 0.0 |
| Lane LOS | E | B | F | A | | A | |
| Approach Delay (s) | 12.3 | | 127.8 | 4.0 | | 0.1 | |
| Approach LOS | B | | F | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 10.4 | | | |
| Intersection Capacity Utilization | 44.7% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 108 | 253 | 134 | 30 | 61 | 130 | 116 | 273 | 225 | 217 | 6 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 12 | 119 | 278 | 147 | 33 | 67 | 143 | 127 | 300 | 247 | 238 | 7 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1233 | 1449 | 242 | 1634 | 1303 | 277 | 245 | | | 427 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1233 | 1449 | 242 | 1634 | 1303 | 277 | 245 | | | 427 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 86 | 0 | 65 | 0 | 71 | 91 | 89 | | | 78 | | |
| cM capacity (veh/h) | 84 | 91 | 797 | 0 | 112 | 761 | 1321 | | | 1132 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 131 | 278 | 247 | 143 | 427 | 247 | 245 |
| Volume Left | 12 | 0 | 147 | 143 | 0 | 247 | 0 |
| Volume Right | 0 | 278 | 67 | 0 | 300 | 0 | 7 |
| cSH | 91 | 797 | 0 | 1321 | 1700 | 1132 | 1700 |
| Volume to Capacity | 1.44 | 0.35 | Err | 0.11 | 0.25 | 0.22 | 0.14 |
| Queue Length 95th (ft) | 249 | 39 | Err | 9 | 0 | 21 | 0 |
| Control Delay (s) | 333.9 | 11.9 | Err | 8.1 | 0.0 | 9.1 | 0.0 |
| Lane LOS | F | B | F | A | | A | |
| Approach Delay (s) | 114.9 | | Err | 2.0 | | 4.6 | |
| Approach LOS | F | | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | Err | | |
| Intersection Capacity Utilization | 64.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 351 | 255 | 133 | 16 | 4 | 92 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 382 | 277 | 145 | 17 | 4 | 100 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 162 | | | | 1193 | 153 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 162 | | | | 1193 | 153 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 73 | | | | 97 | 89 |
| cM capacity (veh/h) | 1417 | | | | 151 | 893 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 659 | 162 | 4 | 100 |
| Volume Left | 382 | 0 | 4 | 0 |
| Volume Right | 0 | 17 | 0 | 100 |
| cSH | 1417 | 1700 | 151 | 893 |
| Volume to Capacity | 0.27 | 0.10 | 0.03 | 0.11 |
| Queue Length 95th (ft) | 27 | 0 | 2 | 9 |
| Control Delay (s) | 6.1 | 0.0 | 29.6 | 9.5 |
| Lane LOS | A | | D | A |
| Approach Delay (s) | 6.1 | 0.0 | 10.4 | |
| Approach LOS | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.5 | | |
| Intersection Capacity Utilization | 54.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | ↑ | ↑ | | Y | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 233 | 26 | 88 | 10 | 3 | 61 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 253 | 28 | 96 | 11 | 3 | 66 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 107 | | | | 636 | 101 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 107 | | | | 636 | 101 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 83 | | | | 99 | 93 |
| cM capacity (veh/h) | 1484 | | | | 367 | 954 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 282 | 107 | 70 |
| Volume Left | 253 | 0 | 3 |
| Volume Right | 0 | 11 | 66 |
| cSH | 1484 | 1700 | 888 |
| Volume to Capacity | 0.17 | 0.06 | 0.08 |
| Queue Length 95th (ft) | 15 | 0 | 6 |
| Control Delay (s) | 7.3 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 7.3 | 0.0 | 9.4 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 31.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 9 | 53 | 186 | 385 | 129 | 300 | 289 | 208 | 217 | 127 | 131 | 9 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 10 | 61 | 214 | 443 | 148 | 345 | 332 | 239 | 249 | 146 | 151 | 10 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1770 | 1601 | 156 | 1715 | 1481 | 364 | 161 | | | 489 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1770 | 1601 | 156 | 1715 | 1481 | 364 | 161 | | | 489 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 0 | 13 | 76 | 0 | 0 | 49 | 77 | | | 86 | | |
| cM capacity (veh/h) | 0 | 70 | 890 | 11 | 83 | 681 | 1418 | | | 1075 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 71 | 214 | 936 | 332 | 489 | 146 | 161 |
| Volume Left | 10 | 0 | 443 | 332 | 0 | 146 | 0 |
| Volume Right | 0 | 214 | 345 | 0 | 249 | 0 | 10 |
| cSH | 0 | 890 | 22 | 1418 | 1700 | 1075 | 1700 |
| Volume to Capacity | Err | 0.24 | 42.36 | 0.23 | 0.29 | 0.14 | 0.09 |
| Queue Length 95th (ft) | Err | 23 | Err | 23 | 0 | 12 | 0 |
| Control Delay (s) | Err | 10.3 | Err | 8.3 | 0.0 | 8.9 | 0.0 |
| Lane LOS | F | B | F | A | | A | |
| Approach Delay (s) | Err | | Err | 3.4 | | 4.2 | |
| Approach LOS | F | | F | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | Err | | |
| Intersection Capacity Utilization | 94.4% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 192 | 205 | 353 | 7 | 19 | 461 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 209 | 223 | 384 | 8 | 21 | 501 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 391 | | | | 1028 | 388 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 391 | | | | 1028 | 388 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 82 | | | | 90 | 24 |
| cM capacity (veh/h) | 1167 | | | | 213 | 661 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 432 | 391 | 21 | 501 |
| Volume Left | 209 | 0 | 21 | 0 |
| Volume Right | 0 | 8 | 0 | 501 |
| cSH | 1167 | 1700 | 213 | 661 |
| Volume to Capacity | 0.18 | 0.23 | 0.10 | 0.76 |
| Queue Length 95th (ft) | 16 | 0 | 8 | 175 |
| Control Delay (s) | 5.2 | 0.0 | 23.7 | 25.5 |
| Lane LOS | A | | C | D |
| Approach Delay (s) | 5.2 | 0.0 | 25.4 | |
| Approach LOS | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 11.5 | | |
| Intersection Capacity Utilization | 54.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 127 | 97 | 53 | 5 | 13 | 307 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 138 | 105 | 58 | 5 | 14 | 334 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 63 | | | | 442 | 60 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 63 | | | | 442 | 60 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 91 | | | | 97 | 67 |
| cM capacity (veh/h) | 1540 | | | | 522 | 1005 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 243 | 63 | 348 |
| Volume Left | 138 | 0 | 14 |
| Volume Right | 0 | 5 | 334 |
| cSH | 1540 | 1700 | 969 |
| Volume to Capacity | 0.09 | 0.04 | 0.36 |
| Queue Length 95th (ft) | 7 | 0 | 41 |
| Control Delay (s) | 4.6 | 0.0 | 10.8 |
| Lane LOS | A | | B |
| Approach Delay (s) | 4.6 | 0.0 | 10.8 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.4 | | |
| Intersection Capacity Utilization | 45.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX C:

# 2018 & 2018 PLUS PROJECT CONDITIONS TECHNICAL ANALYSIS

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| 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 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Volume (vph) | 117 | 97 | 221 | 464 | 39 | 44 | 372 | 868 | 643 | 117 | 1298 | 87 |
| 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) | 123 | 102 | 233 | 488 | 41 | 46 | 392 | 914 | 677 | 123 | 1366 | 92 |
| RTOR Reduction (vph) | 0 | 0 | 132 | 0 | 0 | 38 | 0 | 0 | 179 | 0 | 0 | 52 |
| Lane Group Flow (vph) | 123 | 102 | 101 | 488 | 41 | 8 | 392 | 914 | 498 | 123 | 1366 | 40 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | pm+ov | Prot | | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Actuated Green, G (s) | 9.4 | 11.6 | 11.6 | 12.5 | 14.7 | 14.7 | 10.0 | 37.5 | 50.0 | 5.5 | 33.0 | 33.0 |
| Effective Green, g (s) | 9.4 | 11.6 | 11.6 | 12.5 | 14.7 | 14.7 | 10.0 | 37.5 | 50.0 | 5.5 | 33.0 | 33.0 |
| Actuated g/C Ratio | 0.11 | 0.14 | 0.14 | 0.15 | 0.18 | 0.18 | 0.12 | 0.45 | 0.60 | 0.07 | 0.40 | 0.40 |
| Clearance Time (s) | 4.0 | 4.0 | 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 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 200 | 260 | 221 | 751 | 330 | 280 | 413 | 1597 | 1029 | 227 | 1405 | 629 |
| v/s Ratio Prot | 0.07 | 0.05 | | c0.10 | c0.02 | | c0.11 | 0.26 | 0.07 | 0.04 | c0.39 | |
| v/s Ratio Perm | | | c0.06 | | | 0.01 | | | 0.24 | | | 0.02 |
| v/c Ratio | 0.62 | 0.39 | 0.46 | 0.65 | 0.12 | 0.03 | 0.95 | 0.57 | 0.48 | 0.54 | 0.97 | 0.06 |
| Uniform Delay, d1 | 35.1 | 32.5 | 32.9 | 33.2 | 28.8 | 28.3 | 36.3 | 16.9 | 9.3 | 37.6 | 24.6 | 15.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 5.5 | 1.0 | 1.5 | 2.0 | 0.2 | 0.0 | 31.1 | 0.5 | 0.4 | 2.6 | 17.7 | 0.0 |
| Delay (s) | 40.6 | 33.5 | 34.4 | 35.2 | 29.0 | 28.3 | 67.4 | 17.4 | 9.7 | 40.2 | 42.3 | 15.5 |
| Level of Service | D | C | C | D | C | C | E | B | A | D | D | B |
| Approach Delay (s) | | 35.9 | | | 34.2 | | | 24.6 | | | 40.6 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 32.4 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 83.1 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 72.0% | 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 | | | | | | | | | | | | |
| 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 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Volume (vph) | 177 | 146 | 290 | 805 | 83 | 118 | 393 | 1283 | 293 | 160 | 1055 | 91 |
| 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) | 186 | 154 | 305 | 847 | 87 | 124 | 414 | 1351 | 308 | 168 | 1111 | 96 |
| RTOR Reduction (vph) | 0 | 0 | 125 | 0 | 0 | 106 | 0 | 0 | 111 | 0 | 0 | 63 |
| Lane Group Flow (vph) | 186 | 154 | 180 | 847 | 87 | 18 | 414 | 1351 | 197 | 168 | 1111 | 33 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | pm+ov | Prot | | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Actuated Green, G (s) | 17.6 | 14.0 | 14.0 | 16.1 | 12.5 | 12.5 | 11.1 | 35.7 | 51.8 | 5.0 | 29.6 | 29.6 |
| Effective Green, g (s) | 17.6 | 14.0 | 14.0 | 16.1 | 12.5 | 12.5 | 11.1 | 35.7 | 51.8 | 5.0 | 29.6 | 29.6 |
| Actuated g/C Ratio | 0.20 | 0.16 | 0.16 | 0.19 | 0.14 | 0.14 | 0.13 | 0.41 | 0.60 | 0.06 | 0.34 | 0.34 |
| Clearance Time (s) | 4.0 | 4.0 | 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 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 359 | 300 | 255 | 926 | 268 | 228 | 439 | 1456 | 1018 | 198 | 1207 | 540 |
| v/s Ratio Prot | 0.11 | 0.08 | | c0.17 | 0.05 | | c0.12 | c0.38 | 0.04 | 0.05 | 0.31 | |
| v/s Ratio Perm | | | c0.11 | | | 0.01 | | | 0.09 | | | 0.02 |
| v/c Ratio | 0.52 | 0.51 | 0.71 | 0.91 | 0.32 | 0.08 | 0.94 | 0.93 | 0.19 | 0.85 | 0.92 | 0.06 |
| Uniform Delay, d1 | 30.8 | 33.3 | 34.5 | 34.7 | 33.4 | 32.2 | 37.5 | 24.3 | 8.0 | 40.5 | 27.5 | 19.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.3 | 1.5 | 8.6 | 13.3 | 0.7 | 0.1 | 28.9 | 10.5 | 0.1 | 27.1 | 11.4 | 0.0 |
| Delay (s) | 32.1 | 34.8 | 43.0 | 47.9 | 34.1 | 32.3 | 66.4 | 34.8 | 8.1 | 67.6 | 38.9 | 19.3 |
| Level of Service | C | C | D | D | C | C | E | C | A | E | D | B |
| Approach Delay (s) | | 37.9 | | | 45.0 | | | 37.1 | | | 41.0 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 39.9 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 0.82 | | |
| Actuated Cycle Length (s) | 86.8 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 76.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| 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 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Volume (vph) | 117 | 203 | 221 | 532 | 66 | 102 | 372 | 822 | 900 | 338 | 1261 | 87 |
| 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) | 123 | 214 | 233 | 560 | 69 | 107 | 392 | 865 | 947 | 356 | 1327 | 92 |
| RTOR Reduction (vph) | 0 | 0 | 170 | 0 | 0 | 81 | 0 | 0 | 42 | 0 | 0 | 47 |
| Lane Group Flow (vph) | 123 | 214 | 63 | 560 | 69 | 26 | 392 | 865 | 905 | 356 | 1327 | 45 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | pm+ov | Prot | | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Actuated Green, G (s) | 12.2 | 15.0 | 15.0 | 23.7 | 26.5 | 26.5 | 12.0 | 39.6 | 63.3 | 13.5 | 41.1 | 41.1 |
| Effective Green, g (s) | 12.2 | 15.0 | 15.0 | 23.7 | 26.5 | 26.5 | 12.0 | 39.6 | 63.3 | 13.5 | 41.1 | 41.1 |
| Actuated g/C Ratio | 0.11 | 0.14 | 0.14 | 0.22 | 0.25 | 0.25 | 0.11 | 0.37 | 0.59 | 0.13 | 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 | 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 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 200 | 259 | 220 | 1097 | 458 | 389 | 382 | 1300 | 988 | 430 | 1349 | 604 |
| v/s Ratio Prot | 0.07 | c0.11 | | 0.11 | 0.04 | | c0.11 | 0.24 | c0.20 | 0.10 | c0.37 | |
| v/s Ratio Perm | | | 0.04 | | | 0.02 | | | 0.37 | | | 0.03 |
| v/c Ratio | 0.62 | 0.83 | 0.28 | 0.51 | 0.15 | 0.07 | 1.03 | 0.67 | 0.92 | 0.83 | 0.98 | 0.07 |
| Uniform Delay, d1 | 45.6 | 45.1 | 41.6 | 37.0 | 31.8 | 31.2 | 47.9 | 28.6 | 19.9 | 46.0 | 33.0 | 21.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 5.5 | 18.9 | 0.7 | 0.4 | 0.2 | 0.1 | 52.9 | 1.3 | 12.8 | 12.4 | 20.5 | 0.1 |
| Delay (s) | 51.1 | 64.1 | 42.3 | 37.4 | 32.0 | 31.2 | 100.8 | 29.9 | 32.6 | 58.4 | 53.5 | 21.3 |
| Level of Service | D | E | D | D | C | C | F | C | C | E | D | C |
| Approach Delay (s) | | 52.4 | | | 36.0 | | | 43.7 | | | 52.8 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 46.6 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 107.8 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 86.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

SIDRA INTERSECTION

# Movement Summary

## Village at the Peak - Calle de la Plata/Driveway A

### 2018 Plus Project Conditions - AM Peak

Roundabout

### Vehicle Movements

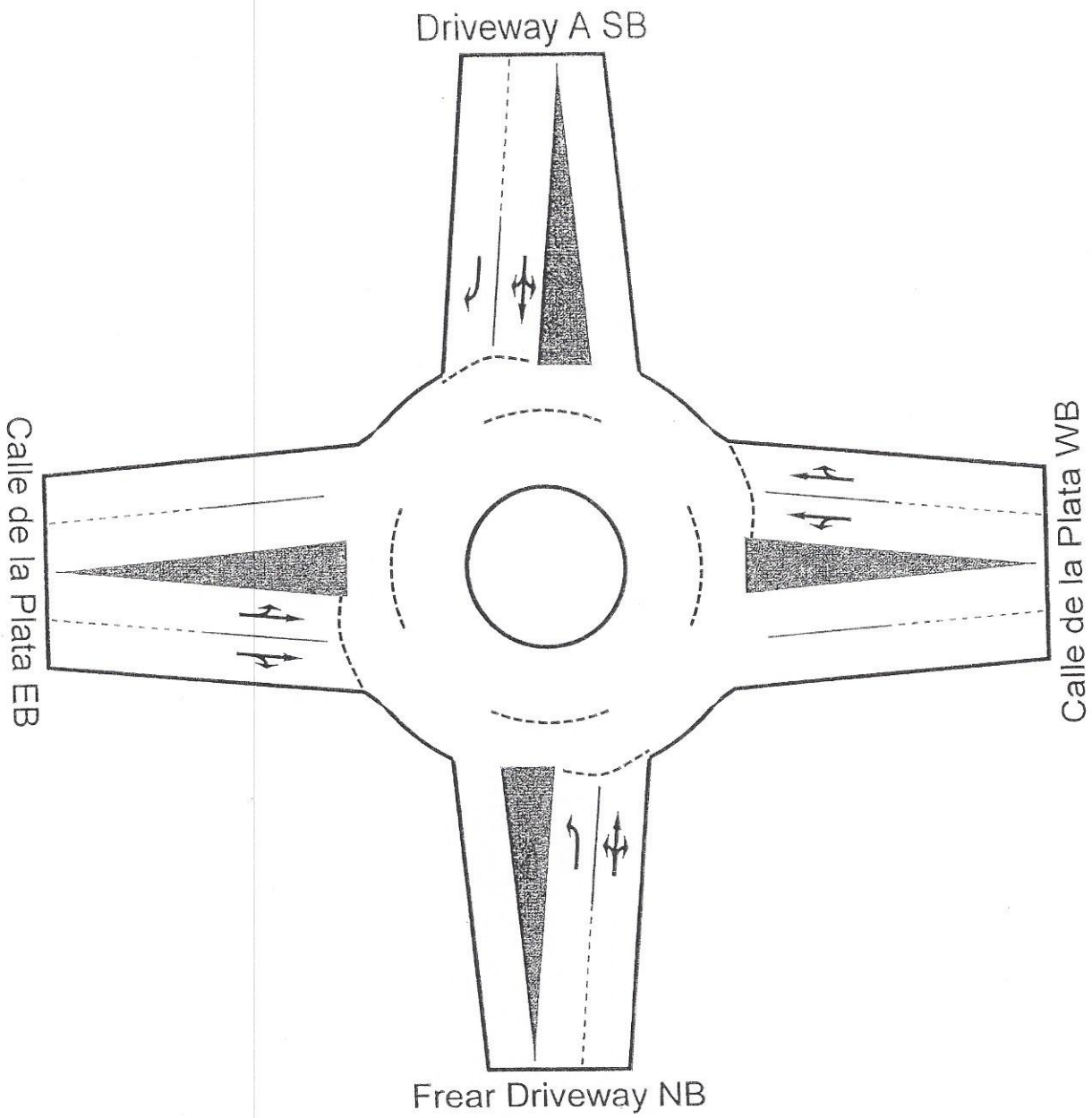
| Mov ID | Turn | Dem Flow (veh/h) | %HV | Deg of Satn (v/c) | Aver Delay (sec) | Level of Service | 95% Back of Queue (ft) | Prop. Queued | Eff. Stop Rate | Aver Speed (mph) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frear Driveway NB** | | | | | | | | | | |
| 3L | L | 206 | 1.9 | 0.163 | 13.2 | LOS B | 23 | 0.63 | 0.86 | 21.9 |
| 8T | T | 1 | 50.0 | 0.167 | 4.2 | LOS A | 23 | 0.63 | 0.62 | 22.9 |
| 8R | R | 14 | 6.7 | 0.163 | 7.2 | LOS A | 23 | 0.63 | 0.69 | 23.3 |
| **Approach** | | **223** | **2.7** | **0.164** | **12.7** | **LOS B** | **23** | **0.63** | **0.84** | **22.0** |
| **Calle de la Plata WB** | | | | | | | | | | |
| 1L | L | 24 | 4.2 | 0.293 | 12.3 | LOS B | 46 | 0.59 | 0.81 | 27.9 |
| 6T | T | 448 | 2.0 | 0.293 | 8.1 | LOS A | 46 | 0.59 | 0.68 | 31.6 |
| 6R | R | 17 | 5.6 | 0.295 | 8.2 | LOS A | 46 | 0.59 | 0.74 | 30.8 |
| **Approach** | | **490** | **2.2** | **0.293** | **8.3** | **LOS A** | **46** | **0.59** | **0.69** | **31.4** |
| **Driveway A SB** | | | | | | | | | | |
| 7L | L | 4 | 20.0 | 0.068 | 11.5 | LOS B | 9 | 0.53 | 0.78 | 22.4 |
| 4T | T | 1 | 50.0 | 0.069 | 2.6 | LOS A | 9 | 0.53 | 0.38 | 23.2 |
| 4R | R | 100 | 2.0 | 0.069 | 5.4 | LOS A | 9 | 0.53 | 0.58 | 23.6 |
| **Approach** | | **107** | **3.7** | **0.069** | **5.6** | **LOS A** | **9** | **0.53** | **0.59** | **23.6** |
| **Calle de la Plata EB** | | | | | | | | | | |
| 5L | L | 382 | 2.1 | 0.540 | 9.6 | LOS A | 136 | 0.20 | 0.59 | 29.1 |
| 2T | T | 599 | 2.0 | 0.540 | 5.4 | LOS A | 137 | 0.19 | 0.42 | 33.7 |
| 2R | R | 586 | 2.0 | 0.540 | 5.5 | LOS A | 137 | 0.19 | 0.45 | 32.8 |
| **Approach** | | **1567** | **2.0** | **0.539** | **6.5** | **LOS A** | **137** | **0.19** | **0.47** | **32.1** |
| **All Vehicles** | | **2387** | **2.2** | **0.540** | **7.4** | **LOS A** | **137** | **0.33** | **0.56** | **30.1** |

Symbols which may appear in this table:

Following Degree of Saturation
# x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
# - Based on density for continuous movements

Following Queue


Driveway A SB
Calle de la Plata EB
Calle de la Plata WB
Frear Driveway NB

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 233 | 335 | 389 | 10 | 3 | 61 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 245 | 353 | 409 | 11 | 3 | 64 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 420 | | | | 1258 | 415 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 420 | | | | 1258 | 415 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 78 | | | | 98 | 90 |
| cM capacity (veh/h) | 1139 | | | | 148 | 638 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 245 | 353 | 420 | 67 |
| Volume Left | 245 | 0 | 0 | 3 |
| Volume Right | 0 | 0 | 11 | 64 |
| cSH | 1139 | 1700 | 1700 | 552 |
| Volume to Capacity | 0.22 | 0.21 | 0.25 | 0.12 |
| Queue Length 95th (ft) | 20 | 0 | 0 | 10 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 | 12.4 |
| Lane LOS | A | | | B |
| Approach Delay (s) | 3.7 | | 0.0 | 12.4 |
| Approach LOS | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 47.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| 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 | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 4990 | 1863 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Volume (vph) | 177 | 195 | 290 | 1150 | 209 | 415 | 393 | 1236 | 438 | 285 | 1016 | 91 |
| 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) | 186 | 205 | 305 | 1211 | 220 | 437 | 414 | 1301 | 461 | 300 | 1069 | 96 |
| RTOR Reduction (vph) | 0 | 0 | 144 | 0 | 0 | 186 | 0 | 0 | 54 | 0 | 0 | 66 |
| Lane Group Flow (vph) | 186 | 205 | 161 | 1211 | 220 | 251 | 414 | 1301 | 407 | 300 | 1069 | 30 |
| Turn Type | Prot | | Perm | Prot | | Perm | Prot | | pm+ov | Prot | | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Actuated Green, G (s) | 14.0 | 14.4 | 14.4 | 24.0 | 24.4 | 24.4 | 13.0 | 35.0 | 59.0 | 9.0 | 31.0 | 31.0 |
| Effective Green, g (s) | 14.0 | 14.4 | 14.4 | 24.0 | 24.4 | 24.4 | 13.0 | 35.0 | 59.0 | 9.0 | 31.0 | 31.0 |
| Actuated g/C Ratio | 0.14 | 0.15 | 0.15 | 0.24 | 0.25 | 0.25 | 0.13 | 0.36 | 0.60 | 0.09 | 0.32 | 0.32 |
| Clearance Time (s) | 4.0 | 4.0 | 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 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 252 | 273 | 232 | 1217 | 462 | 393 | 454 | 1259 | 1014 | 314 | 1115 | 499 |
| v/s Ratio Prot | 0.11 | c0.11 | | c0.24 | 0.12 | | c0.12 | c0.37 | 0.10 | 0.09 | 0.30 | |
| v/s Ratio Perm | | | 0.10 | | | 0.16 | | | 0.16 | | | 0.02 |
| v/c Ratio | 0.74 | 0.75 | 0.69 | 1.00 | 0.48 | 0.64 | 0.91 | 1.03 | 0.40 | 0.96 | 0.96 | 0.06 |
| Uniform Delay, d1 | 40.4 | 40.3 | 39.9 | 37.1 | 31.6 | 33.1 | 42.1 | 31.7 | 10.4 | 44.5 | 33.1 | 23.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 10.7 | 11.0 | 8.6 | 24.4 | 0.8 | 3.4 | 22.4 | 34.4 | 0.3 | 38.6 | 17.7 | 0.1 |
| Delay (s) | 51.2 | 51.3 | 48.5 | 61.6 | 32.3 | 36.5 | 64.6 | 66.1 | 10.6 | 83.1 | 50.8 | 23.6 |
| Level of Service | D | D | D | E | C | D | E | E | B | F | D | C |
| Approach Delay (s) | | 50.1 | | | 52.3 | | | 54.0 | | | 55.6 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 53.4 | HCM Level of Service | D |
| HCM Volume to Capacity ratio | 0.98 | | |
| Actuated Cycle Length (s) | 98.4 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 87.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

SIDRA INTERSECTION

# Movement Summary

## Village at the Peak - Calle de la Plata/Driveway A

## 2018 Plus Project Conditions - PM Peak

Roundabout

### Vehicle Movements

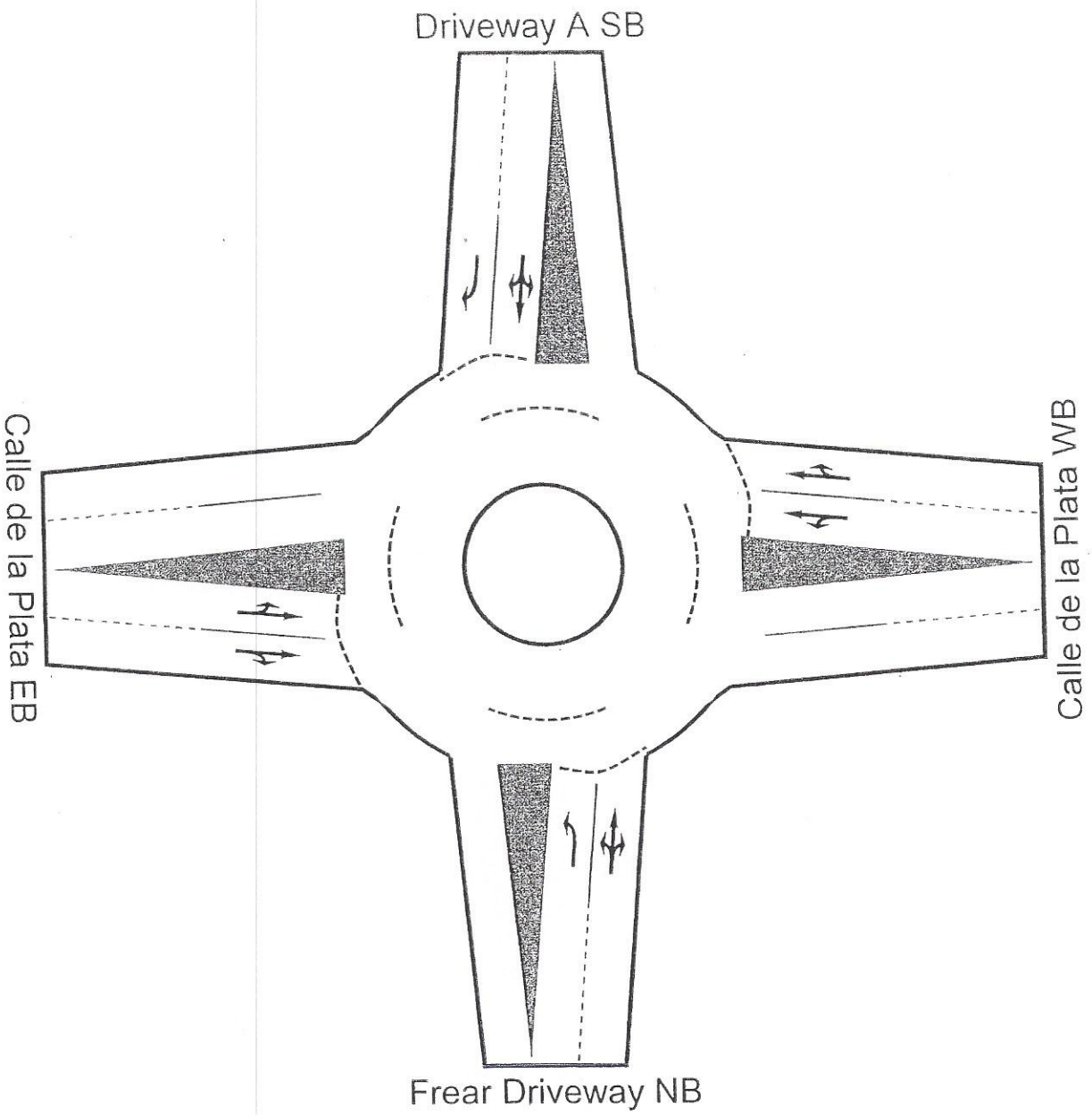
| Mov ID | Turn | Dem Flow (veh/h) | %HV | Deg of Satn (v/c) | Aver Delay (sec) | Level of Service | 95% Back of Queue (ft) | Prop. Queued | Eff. Stop Rate | Aver Speed (mph) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frear Driveway NB** | | | | | | | | | | |
| 3L | L | 707 | 2.0 | 0.451 | 12.8 | LOS B | 81 | 0.65 | 0.90 | 22.0 |
| 8T | T | 1 | 50.0 | 0.500 | 3.9 | LOS A | 81 | 0.65 | 0.61 | 22.8 |
| 8R | R | 40 | 2.5 | 0.449 | 6.9 | LOS A | 81 | 0.65 | 0.75 | 23.3 |
| **Approach** | | **749** | **2.1** | **0.451** | **12.5** | **LOS B** | **81** | **0.65** | **0.90** | **22.1** |
| **Calle de la Plata WB** | | | | | | | | | | |
| 1L | L | 39 | 2.6 | 0.565 | 15.6 | LOS B | 114 | 0.79 | 1.00 | 26.1 |
| 6T | T | 697 | 2.0 | 0.562 | 11.3 | LOS B | 115 | 0.79 | 0.95 | 30.2 |
| 6R | R | 8 | 12.5 | 0.571 | 11.3 | LOS B | 115 | 0.79 | 0.96 | 28.9 |
| **Approach** | | **744** | **2.2** | **0.562** | **11.5** | **LOS B** | **115** | **0.79** | **0.96** | **29.9** |
| **Driveway A SB** | | | | | | | | | | |
| 7L | L | 21 | 4.8 | 0.488 | 16.9 | LOS B | 81 | 0.79 | 1.02 | 20.7 |
| 4T | T | 1 | 50.0 | 0.500 | 8.0 | LOS A | 81 | 0.79 | 0.88 | 21.4 |
| 4R | R | 501 | 2.0 | 0.493 | 10.4 | LOS B | 84 | 0.79 | 0.96 | 22.0 |
| **Approach** | | **524** | **2.3** | **0.493** | **10.7** | **LOS B** | **84** | **0.79** | **0.96** | **22.0** |
| **Calle de la Plata EB** | | | | | | | | | | |
| 5L | L | 209 | 1.9 | 0.374 | 9.8 | LOS A | 74 | 0.23 | 0.60 | 29.0 |
| 2T | T | 408 | 2.0 | 0.374 | 5.5 | LOS A | 74 | 0.23 | 0.43 | 33.5 |
| 2R | R | 382 | 2.1 | 0.374 | 5.6 | LOS A | 74 | 0.23 | 0.47 | 32.6 |
| **Approach** | | **998** | **2.0** | **0.374** | **6.4** | **LOS A** | **74** | **0.23** | **0.48** | **32.1** |
| **All Vehicles** | | **3015** | **2.1** | **0.571** | **9.9** | **LOS A** | **115** | **0.57** | **0.78** | **26.3** |

Symbols which may appear in this table:

Following Degree of Saturation
# x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
# - Based on density for continuous movements

Following Queue


Driveway A SB
Calle de la Plata EB
Calle de la Plata WB
Frear Driveway NB

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 127 | 304 | 377 | 5 | 13 | 307 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 134 | 320 | 397 | 5 | 14 | 323 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 402 | | | | 987 | 399 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 402 | | | | 987 | 399 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 88 | | | | 94 | 50 |
| cM capacity (veh/h) | 1157 | | | | 243 | 650 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 134 | 320 | 402 | 337 |
| Volume Left | 134 | 0 | 0 | 14 |
| Volume Right | 0 | 0 | 5 | 323 |
| cSH | 1157 | 1700 | 1700 | 609 |
| Volume to Capacity | 0.12 | 0.19 | 0.24 | 0.55 |
| Queue Length 95th (ft) | 10 | 0 | 0 | 84 |
| Control Delay (s) | 8.5 | 0.0 | 0.0 | 18.0 |
| Lane LOS | A | | | C |
| Approach Delay (s) | 2.5 | | 0.0 | 18.0 |
| Approach LOS | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.0 | | |
| Intersection Capacity Utilization | 56.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# APPENDIX G:

# INTERSECTION CRASH DATA

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**INTERSECTION DETAIL**
**SR445 @ CALLE DE LA PLATA**
**01 JUL 09 - 01 JUL 14**
**County: WASHOE**

| Crash Severity | Crash Date | Crash Year | Crash Time | Primary Street | Distance | Dir | Secondary Street |
|---|---|---|---|---|---|---|---|
| INJURY CRASH | 24-Mar-2011 | 2011 | 07:11 PM | CALLE DE LA PLATA | | AT INT | CALLE DE LA PLATA |
| PROPERTY DAMAGE | 08-Mar-2014 | 2014 | 11:20 AM | CALLE DE LA PLATA | | AT INT | SR445 |
| INJURY CRASH | 15-Jan-2014 | 2014 | 08:58 AM | SR445 | | AT INT | CALLE DE LA PLATA |
| PROPERTY DAMAGE | 30-Jan-2014 | 2014 | 05:25 PM | SR445 | 100 | S | CALLE DE LA PLATA |
| FATAL CRASH | 13-Oct-2011 | 2011 | 12:29 PM | SR445 | | AT INT | CALLE DE LA PLATA |
| INJURY CRASH | 15-Mar-2012 | 2012 | 08:25 PM | SR445 | | AT INT | CALLE DE LA PLATA |
| | | | | | | | |

| Weather | Fatalities | Injured | Property Damage Only | Injury Type | Crash Type | Total Vehicles | V1 Type | V1 Dir | V1 Drvr Age |
|---|---|---|---|---|---|---|---|---|---|
| SNOW | | 1 | | B | NON-COLLISION | 1 | PICKUP | E | 64 |
| UNKNOWN | | | PDO | | REAR-END | 2 | SEDAN, 4 DOOR | U | 28 |
| CLEAR | | 3 | | B | HEAD-ON | 2 | PICKUP | U | 44 |
| RAIN | | | PDO | | NON-COLLISION | 1 | UTILITY | U | |
| UNKNOWN | 1 | | | K | NON-COLLISION | 1 | CARRY-ALL | S | |
| RAIN | | 1 | | C | ANGLE | 2 | PICKUP | W | 41 |
| | Sum: 1 | Sum: 5 | Count: 2 | | | | | | |
| | Count: 1 | Count: 3 | | | | | | | |
| | TOTAL | Count: 6 | | | | | | | |

| V1 Lane Num | V1 Action | V1 Driver Factor | V1 Drvr Distracted |
|---|---|---|---|
| 1 | NOT REPORTED | APPARENTLY NORMAL | |
| 1 | TURNING RIGHT | | |
| | TURNING LEFT | INATTENTION/DISTRACTED | UNKNOWN |
| | GOING STRAIGHT | APPARENTLY NORMAL | |
| | GOING STRAIGHT | | |
| | TURNING LEFT | APPARENTLY NORMAL | |
| | | | |

| V1 Vehicle Factor | V1 Most Harmful Event | V1 Event 1 |
|---|---|---|
| RAN OFF ROAD | | DITCH |
| OTHER IMPROPER DRIVING | | SLOW/STOPPED VEHICLE |
| FAILED TO YIELD RIGHT OF WAY | | |
| FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD; UNSAFE LANE CHANGE | | |
| FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD; OVER CORRECTING/OVER STEERING | | RAN OFF ROAD RIGHT |
| FAILED TO YIELD RIGHT OF WAY | MOTOR VEHICLE IN TRANSPORT | |
| | | |

| V1 Event 2 | V2 Type | V2 Dir | V2 Drvr Age | V2 Lane Num | V2 Action |
|---|---|---|---|---|---|
| RAN OFF ROAD LEFT | | | | | |
| | CARRY-ALL | U | 62 | 1 | STOPPED |
| | UTILITY | U | 36 | | GOING STRAIGHT |
| | | | | | |
| | | | | | |
| | HATCHBACK, 4 DOOR | S | 40 | | GOING STRAIGHT |
| | | | | | |

| V2 Factors Driver | V2 Factors Veh | V2 Most Harm Event | V2 Seq Event1 | Factors Roadway |
|---|---|---|---|---|
| | | | | DRY |
| | | | SLOW/STOPPED VEHICLE | DRY |
| APPARENTLY NORMAL | | | | DRY |
| | | | | |
| | | | | DRY |
| APPARENTLY NORMAL | | MOTOR VEHICLE IN TRANSPORT | | DRY |
| | | | | |

| Lighting | HWY Factors | Agency | Accident Rec Num |
|---|---|---|---|
| DARK - NO LIGHTING | WEATHER | WASO | 1855109 |
| DAYLIGHT | NONE | WASO | 2121766 |
| DAYLIGHT | NONE | NHP | 2100243 |
| | | NHP | 2100906 |
| DAYLIGHT | UNKNOWN | NHP | 1915704 |
| DARK - SPOT LIGHTING | NONE | NHP | 1903118 |
| | | | |

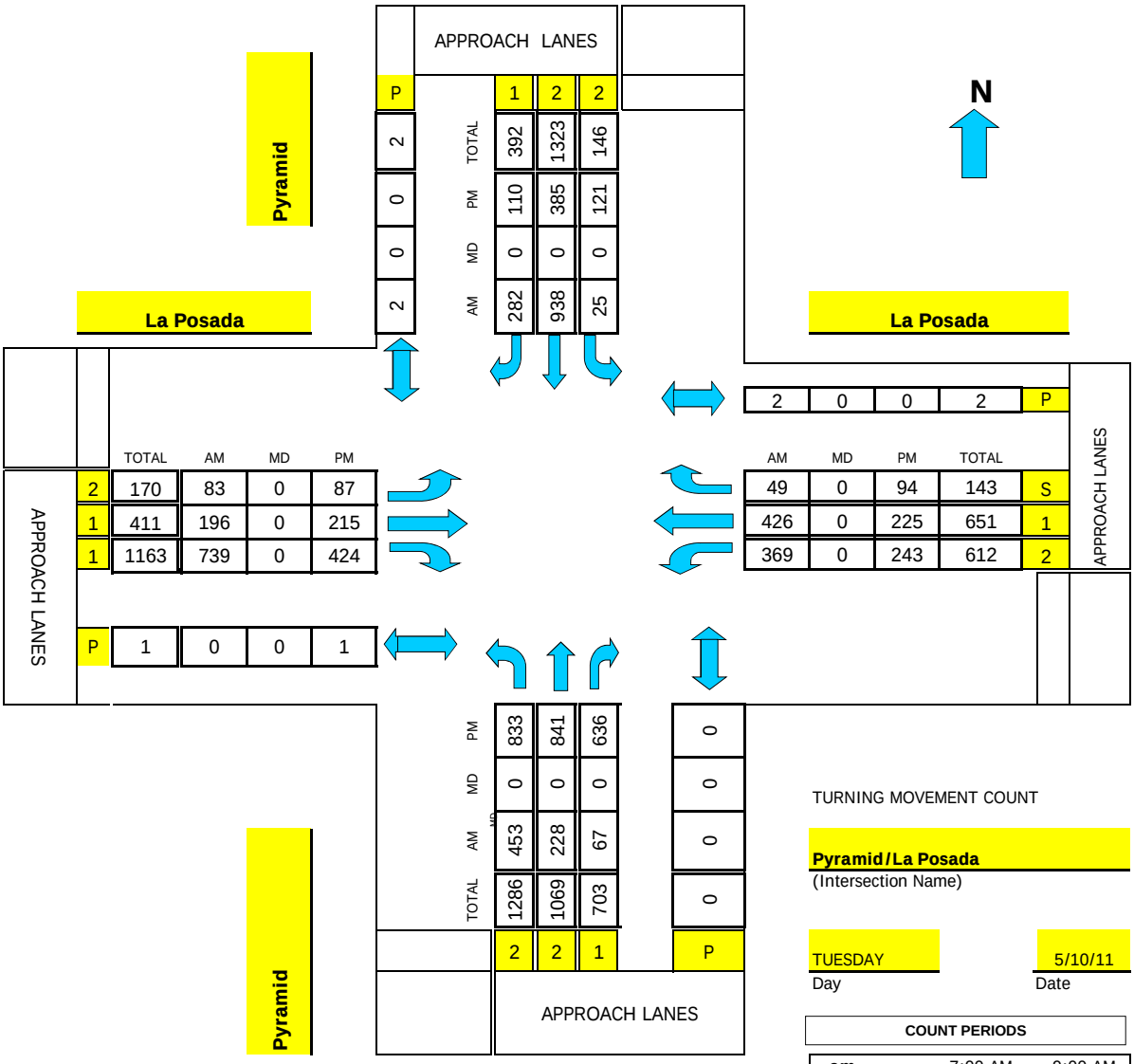
# APPENDIX H:

# TURNING MOVEMENT COUNT: PYRAMID HIGHWAY AND POSADA

STAR CONSULTING

# ***TMC Summary of Pyramid/La Posada***

Project #: 0




TURNING MOVEMENT COUNT

**Pyramid/La Posada**
(Intersection Name)

TUESDAY
Day

5/10/11
Date

**COUNT PERIODS**

| | | | |
|---|---|---|---|
| **am** | 7:00 AM | - | 9:00 AM |
| **noon** | 11:00 AM | - | 1:00 PM |
| **pm** | 4:00 PM | - | 6:00 PM |

AM PEAK HOUR 700 AM

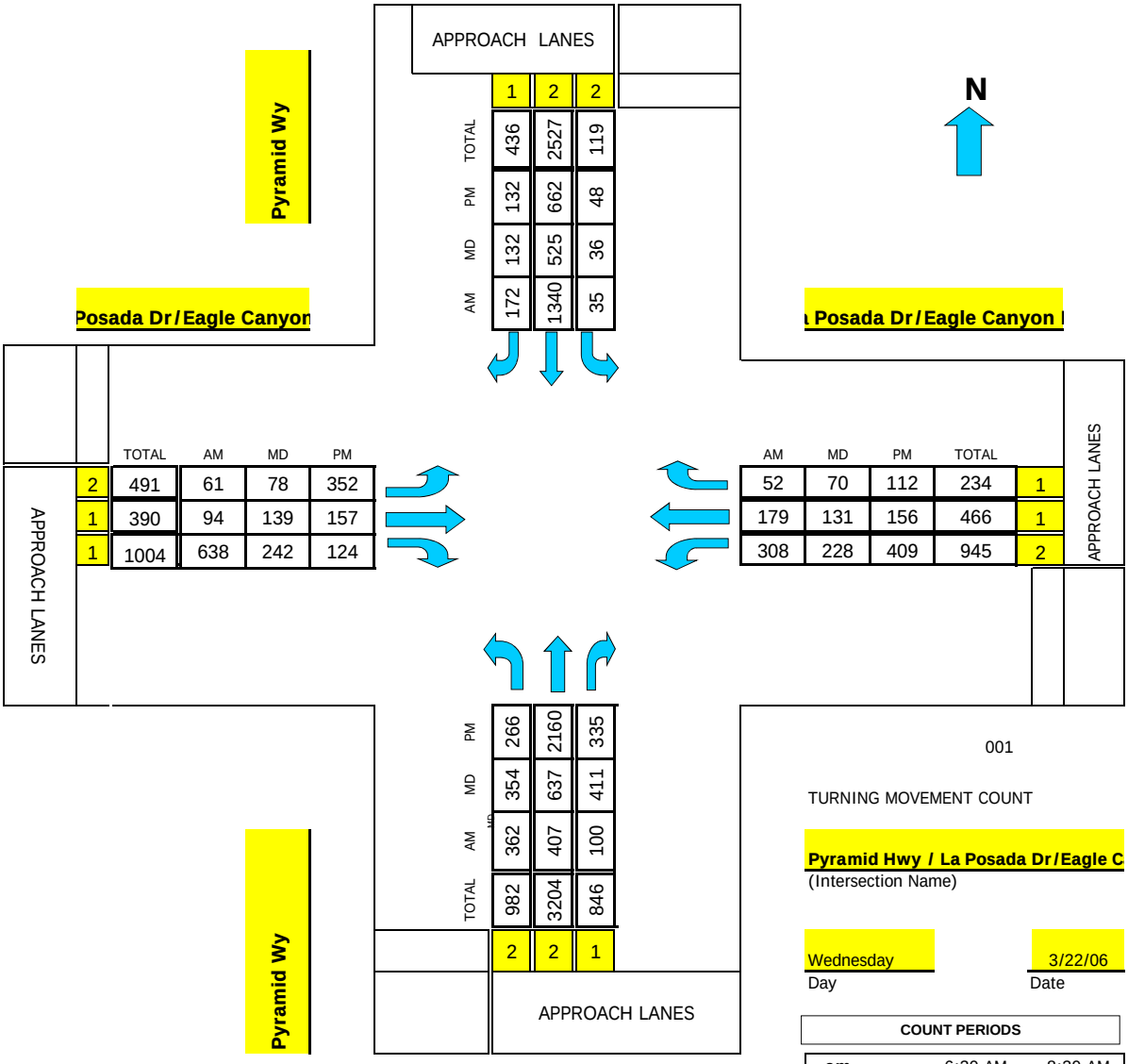
NOON PEAK HOUR 0 AM

PM PEAK HOUR 500 PM

Heavy Vehicle Percentage 0.00%

# ***TMC Summary of Pyramid Wy/La Posada Dr/Eagle Canyon Dr***

Project #: 06-8039-061




001

TURNING MOVEMENT COUNT

**Pyramid Hwy / La Posada Dr/Eagle C**
(Intersection Name)

Wednesday
Day

3/22/06
Date

| COUNT PERIODS | | | |
|---|---|---|---|
| **am** | 6:30 AM | - | 8:30 AM |
| **noon** | 2:00 PM | - | 4:00 PM |
| **pm** | 4:30 PM | - | 6:30 PM |

| | |
|---|---|
| AM PEAK HOUR | 700 AM |
| NOON PEAK HOUR | 245 PM |
| PM PEAK HOUR | 500 PM |

# APPENDIX I:

# 5TH EDITING RRIF BROCHURE

STAR
CONSULTING

# REGIONAL ROAD IMPACT FEE SCHEDULE

| Land Use | | North Service Area | | South Service Area | |
|---|---|---|---|---|---|
| **Residential** | **Unit** | **VMT** | **Dollars ($253.39/VMT)** | **VMT** | **Dollars ($287.05/VMT)** |
| Single-Family | Dwelling | 14.93 | $3,783.11 | 14.67 | $4,211.02 |
| Multi-Family | Dwelling | 9.70 | $2,457.88 | 9.53 | $2,735.59 |
| **Industrial** | | | | | |
| General Light Industrial | 1,000 GFA | 7.30 | $1,849.75 | 7.17 | $2,058.15 |
| Manufacturing | 1,000 GFA | 4.00 | $1,013.56 | 3.93 | $1,128.11 |
| Warehouse | 1,000 GFA | 3.73 | $945.14 | 3.66 | $1,050.60 |
| Mini-Warehouse | 1,000 GFA | 2.62 | $663.88 | 2.57 | $737.72 |
| **Commercial/Retail** | | | | | |
| Commercial/Retail | 1,000 GFA | 26.69 | $6,762.98 | 26.23 | $7,529.32 |
| Eating/Drinking Places | 1,000 GFA | 26.69 | $6,762.98 | 26.23 | $7,529.32 |
| Casino/Gaming | 1,000 GFA | 48.24 | $12,223.53 | 47.40 | $13,606.17 |
| **Office and Other Services** | | | | | |
| Schools | 1,000 GFA | 10.67 | $2,703.67 | 10.48 | $3,008.28 |
| Day Care | 1,000 GFA | 10.67 | $2,703.67 | 10.48 | $3,008.28 |
| Lodging | Room | 5.90 | $1,495.00 | 5.79 | $1,662.02 |
| Hospital | 1,000 GFA | 13.85 | $3,509.45 | 13.61 | $3,906.75 |
| Nursing Home | 1,000 GFA | 7.96 | $2,016.98 | 7.82 | $2,244.73 |
| Medical Office | 1,000 GFA | 37.85 | $9,590.81 | 37.19 | $10,675.39 |
| Office and Other Services | 1,000 GFA | 11.55 | $2,926.65 | 11.35 | $3,258.02 |
| Regional Recreational Facility | Acre | 2.39 | $605.60 | 2.35 | $674.57 |

## Regional Road Impact Fee (RRIF)

**5th Edition**

**March 2, 2015**

**An informational brochure brought to you by the**

RTC

**www.rtcwashoe.com**

# 5th Edition Regional Road Impact Fees

## General Information

1. **What is the Regional Road Impact Fee (RRIF)?**
   New development creates a demand for new roadway capacity. The RRIF is a tool to collect the cost of providing the new capacity for new development.

2. **What is the cost of the RRIF?**
   See the impact fee schedule on the reverse side of this brochure.

3. **How will the RRIF funds be used?**
   To build capacity improvements such as new roads and ramps, road widening and intersection improvements, and to preserve right of way for future capacity improvements.

4. **When does the 5th Edition of the impact fees take effect?**
   The new fee schedule goes into effect March 2, 2015. The amount of impact fees shall be determined as of the date of payment.

5. **When will the RRIF need to be paid?**
   At the time a building permit is issued or may be deferred to the Certificate of Occupancy, as approved by the local jurisdiction.

6. **Payment Options?**
   Pay impact fees due with check or money order. Or pay impact fees due with credits or waivers earned for constructing capacity improvements or right-of-way dedication included in the RRIF Capital Improvements Plan (CIP).

## Regional Road Impact Fee Administrators

**City of Reno – Bill Gall, P.E.**
Engineering Manager
City of Reno, Community Development
One East First Street, 2nd Floor
Reno, Nevada 89501
(775) 334-2028, fax (775) 334-2382
e-mail: gallw@reno.gov

**City of Sparks – John Martini, P.E.** Assistant Community Services Director City of Sparks, City Works
431 Prater Way
Sparks, NV 89431
(775) 353-4080, fax (775) 353-1608
e-mail: jmartini@cityofsparks.us

**Washoe County - Clara Lawson, P.E.**
Washoe County Public Works
Engineering Division
1001 E 9th Street, Reno, NV 89520
(775) 328-3603, fax (775) 328-3699
e-mail: clawson@mail.co.washoe.nv.us

**RTC – Jeffrey D. Hale, P.E.**
Engineering Director
Regional Transportation Commission
Engineering Department
1105 Terminal Way, Suite 108
(775) 348-0171, fax (775) 348-0170
e-mail: jhale@rtcwashoe.com

or **Julie Masterpool, P.E.**
Senior Traffic Engineer
(775)335-1897, fax (775) 348-0170
e-mail: jmasterpool@rtcwashoe.com

## Significant Changes in the 5th Edition RRIF

Service Areas – North and South Service Areas are divided by I-80. Fees collected within a service area will be spent in the same service area to construct capacity improvements from the RRIF Capital Improvement Plan.

Simplified Land Use Categories – Reduction in the number of land use categories, in particular related to commercial/ retail uses.

Change of Use Fees – For modification of a previous land use requiring a permit, the impact fee will be based on the net increase of the new use to the previous use. The feepayer must provide documentation of the most recent previous use and there is no time limit for the last use determination.

RRIF Waivers – Issued for capital improvements constructed by new development after adoption of the 5th Edition RRIF. Waivers may only be used to pay the impact fee due within the designated development of record associated with the waivers.

RRIF Credits – Issued for capital improvements constructed by new development prior to the adoption of the 5th Edition RRIF. Credits may be used only within the CCFEA Benefit District associated with the credits and per the CCFEA agreement.

To find out more information on the RRIF Program, please visit www.rtcwashoe.com and type “RRIF” in the search box.

# APPENDIX J:

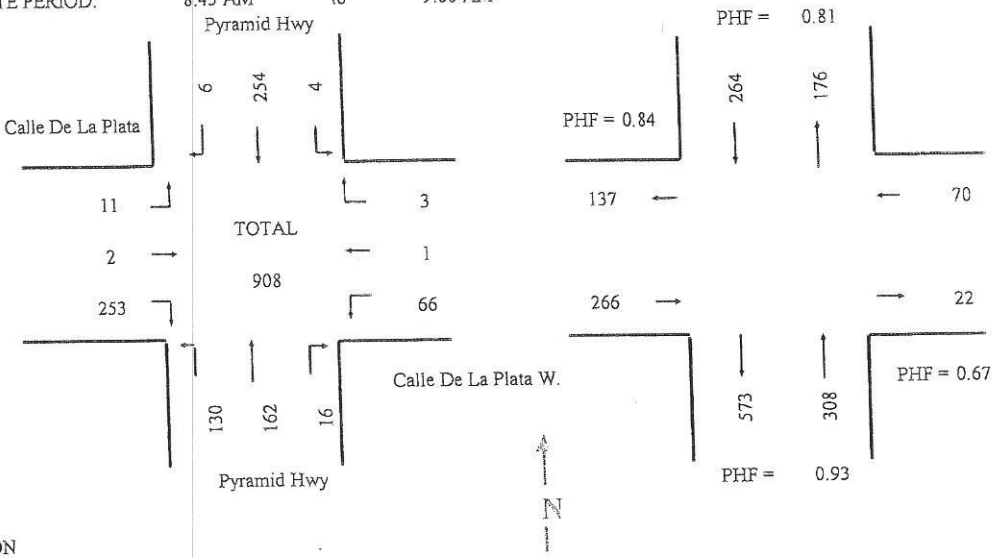
# INTERSECTION TURNING MOVEMENT DATA

STAR CONSULTING

# INTERSECTION TURNING MOVEMENT SUMMARY

| | | | |
|---|---|---|---|
| INTERSECTION: | Calle De La Plata West/Pyramid Hwy | TIME: | 7:00 AM to 9:00 AM |
| JURISDICTION: | | DATE: | Thur 8-21-08 |
| PROJECT TITLE: | Calle De La Plata West | PROJECT NO: | RN08-0405 |

PEAK HOUR PERIOD: 8:00 AM to 9:00 AM
PEAK 15 MINUTE PERIOD: 8:45 AM to 9:00 AM




INTERSECTION PEAK HOUR FACTOR: 0.91

## RUNNING COUNTS

| | Calle De La Plata Eastbound | | | Calle De La Plata W. Westbound | | | Pyramid Hwy Northbound | | | Pyramid Hwy Southbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period End | Left A | Thru B | Right C | Left D | Thru E | Right F | Left G | Thru H | Right I | Left J | Thru K | Right L | TOTAL |
| 7:15 AM | 4 | 1 | 71 | 22 | 1 | 0 | 23 | 36 | 3 | 1 | 65 | 1 | 228 |
| 7:30 AM | 6 | 2 | 147 | 37 | 1 | 0 | 46 | 75 | 8 | 1 | 145 | 5 | 473 |
| 7:45 AM | 11 | 2 | 201 | 50 | 2 | 1 | 75 | 107 | 8 | 2 | 185 | 5 | 649 |
| 8:00 AM | 11 | 2 | 258 | 61 | 2 | 1 | 104 | 145 | 14 | 3 | 240 | 6 | 847 |
| 8:15 AM | 14 | 2 | 302 | 69 | 2 | 2 | 130 | 187 | 18 | 3 | 296 | 7 | 1032 |
| 8:30 AM | 15 | 3 | 364 | 89 | 2 | 4 | 164 | 232 | 22 | 6 | 356 | 8 | 1265 |
| 8:45 AM | 20 | 4 | 434 | 114 | 3 | 4 | 201 | 267 | 26 | 7 | 415 | 10 | 1505 |
| 9:00 AM | 22 | 4 | 511 | 127 | 3 | 4 | 234 | 307 | 30 | 7 | 494 | 12 | 1755 |

## PERIOD COUNTS

| Period End | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7:15 AM | 4 | 1 | 71 | 22 | 1 | 0 | 23 | 36 | 3 | 1 | 65 | 1 | 228 |
| 7:30 AM | 2 | 1 | 76 | 15 | 0 | 0 | 23 | 39 | 5 | 0 | 80 | 4 | 245 |
| 7:45 AM | 5 | 0 | 54 | 13 | 1 | 1 | 29 | 32 | 0 | 1 | 40 | 0 | 176 |
| 8:00 AM | 0 | 0 | 57 | 11 | 0 | 0 | 29 | 38 | 6 | 1 | 55 | 1 | 198 |
| 8:15 AM | 3 | 0 | 44 | 8 | 0 | 1 | 26 | 42 | 4 | 0 | 56 | 1 | 185 |
| 8:30 AM | 1 | 1 | 62 | 20 | 0 | 2 | 34 | 45 | 4 | 3 | 60 | 1 | 233 |
| 8:45 AM | 5 | 1 | 70 | 25 | 1 | 0 | 37 | 35 | 4 | 1 | 59 | 2 | 240 |
| 9:00 AM | 2 | 0 | 77 | 13 | 0 | 0 | 33 | 40 | 4 | 0 | 79 | 2 | 250 |

## HOURLY TOTALS

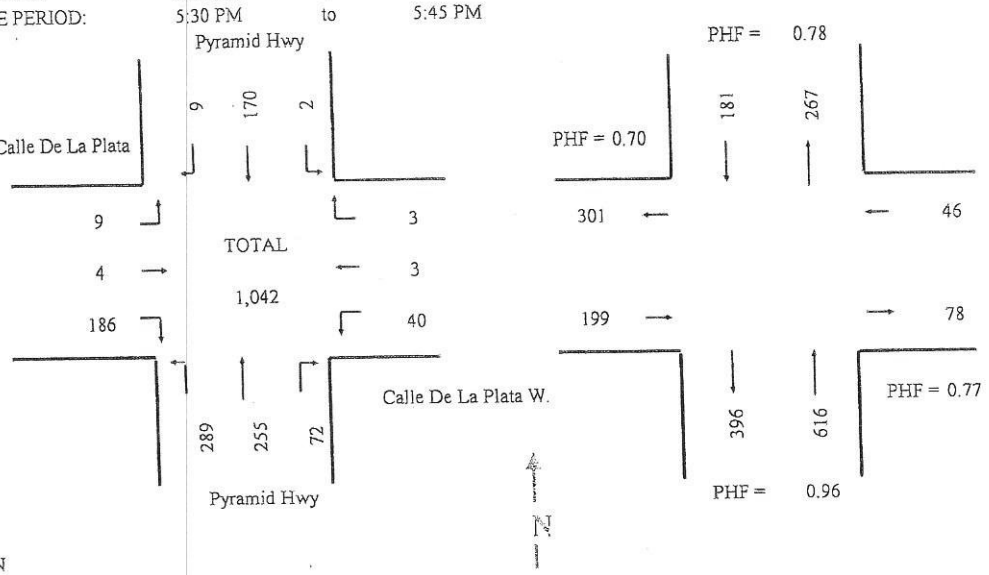
| Beginning At | A | B | C | D | E | F | G | H | I | J | K | L | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7:00 AM | 11 | 2 | 258 | 61 | 2 | 1 | 104 | 145 | 14 | 3 | 240 | 6 | 847 |
| 7:15 AM | 10 | 1 | 231 | 47 | 1 | 2 | 107 | 151 | 15 | 2 | 231 | 6 | 804 |
| 7:30 AM | 9 | 1 | 217 | 52 | 1 | 4 | 118 | 157 | 14 | 5 | 211 | 3 | 792 |
| 7:45 AM | 9 | 2 | 233 | 64 | 1 | 3 | 126 | 160 | 18 | 5 | 230 | 5 | 856 |
| 8:00 AM | 11 | 2 | 253 | 66 | 1 | 3 | 130 | 162 | 16 | 4 | 254 | 6 | 908 |

# INTERSECTION TURNING MOVEMENT SUMMARY

INTERSECTION: Calle De La Plata West/Pyramid Hwy
JURISDICTION:
PROJECT TITLE: Calle De La Plata West

TIME: 4:00 PM to 6:00 PM
DATE: Thur 8-21-08
PROJECT NO: RN08-0405

PEAK HOUR PERIOD: 5:00 PM to 6:00 PM
PEAK 15 MINUTE PERIOD: 5:30 PM to 5:45 PM




INTERSECTION PEAK HOUR FACTOR: 0.87

| RUNNING COUNTS | Calle De La Plata Eastbound | | | Calle De La Plata W. Westbound | | | Pyramid Hwy Northbound | | | Pyramid Hwy Southbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| **Period End** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **TOTAL** |
| 4:15 PM | 0 | 0 | 59 | 11 | 2 | 1 | 49 | 64 | 21 | 0 | 29 | 1 | 237 |
| 4:30 PM | 5 | 1 | 100 | 24 | 2 | 1 | 84 | 116 | 35 | 0 | 76 | 4 | 448 |
| 4:45 PM | 6 | 2 | 141 | 29 | 3 | 1 | 128 | 170 | 53 | 0 | 117 | 4 | 654 |
| 5:00 PM | 6 | 4 | 170 | 36 | 3 | 1 | 177 | 214 | 73 | 2 | 146 | 8 | 840 |
| 5:15 PM | 8 | 4 | 223 | 47 | 3 | 3 | 260 | 271 | 92 | 3 | 186 | 10 | 1110 |
| 5:30 PM | 12 | 4 | 255 | 58 | 6 | 4 | 326 | 330 | 106 | 4 | 225 | 15 | 1345 |
| 5:45 PM | 15 | 7 | 320 | 69 | 6 | 4 | 394 | 402 | 124 | 4 | 282 | 16 | 1643 |
| 6:00 PM | 15 | 8 | 356 | 76 | 6 | 4 | 466 | 469 | 145 | 4 | 316 | 17 | 1882 |

| PERIOD COUNTS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Period End** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **TOTAL** |
| 4:15 PM | 0 | 0 | 59 | 11 | 2 | 1 | 49 | 64 | 21 | 0 | 29 | 1 | 237 |
| 4:30 PM | 5 | 1 | 41 | 13 | 0 | 0 | 35 | 52 | 14 | 0 | 47 | 3 | 211 |
| 4:45 PM | 1 | 1 | 41 | 5 | 1 | 0 | 44 | 54 | 18 | 0 | 41 | 0 | 206 |
| 5:00 PM | 0 | 2 | 29 | 7 | 0 | 0 | 49 | 44 | 20 | 2 | 29 | 4 | 186 |
| 5:15 PM | 2 | 0 | 53 | 11 | 0 | 2 | 83 | 57 | 19 | 1 | 40 | 2 | 270 |
| 5:30 PM | 4 | 0 | 32 | 11 | 3 | 1 | 66 | 59 | 14 | 1 | 39 | 5 | 235 |
| 5:45 PM | 3 | 3 | 65 | 11 | 0 | 0 | 68 | 72 | 18 | 0 | 57 | 1 | 298 |
| 6:00 PM | 0 | 1 | 36 | 7 | 0 | 0 | 72 | 67 | 21 | 0 | 34 | 1 | 239 |

| HOURLY TOTALS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Beginning At** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **TOTAL** |
| 4:00 PM | 6 | 4 | 170 | 36 | 3 | 1 | 177 | 214 | 73 | 2 | 146 | 8 | 840 |
| 4:15 PM | 8 | 4 | 164 | 36 | 1 | 2 | 211 | 207 | 71 | 3 | 157 | 9 | 873 |
| 4:30 PM | 7 | 3 | 155 | 34 | 4 | 3 | 242 | 214 | 71 | 4 | 149 | 11 | 897 |
| 4:45 PM | 9 | 5 | 179 | 40 | 3 | 3 | 266 | 232 | 71 | 4 | 165 | 12 | 989 |
| 5:00 PM | 9 | 4 | 186 | 40 | 3 | 3 | 289 | 255 | 72 | 2 | 170 | 9 | 1042 |

September 14, 2015

# FEASIBILITY GEOTECHNICAL INVESTIGATION

APN #534-571-01

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

Job Number 15-25114-01

Prepared For:

Mr. Michael S. Railey
Rubicon Design Group
100 California Avenue, Suite 202
Reno, Nevada 89509

Prepared By:

Converse Consultants
4840 Mill Street, Suite 5
Reno, Nevada 89502
www.converseconsultants.com

**Converse Consultants**
Geotechnical Engineering, Environmental and Groundwater Science, Inspection and Testing Services

September 14, 2015 15-25114-01

Mr. Michael S. Railey, Partner
Rubicon Design Group
100 California Avenue, Suite 202
Reno, Nevada 89509

**SUBJECT: FEASIBILITY GEOTECHNICAL INVESTIGATION**
Proposed 172 Home Subdivision
APN #534-571-01
Spanish Springs, Nevada

Dear Mr. Railey:

In accordance with your written authorization to proceed, we have prepared our "Feasibility Geotechnical Investigation" report for the subject site location near the intersection of Pyramid Highway and Calle de la Plata. Our scope of services included a literature review, field exploration, soil, groundwater, and flooding conditions as well as engineering analyses, and the preparation of this report.

It must be understood that the conclusions presented herein are preliminary in nature and subject to confirmation by a Final Geotechnical Investigation based on the final project design.

The opportunity to be of service to you is sincerely appreciated. If we can assist you further on this project, or if you have any questions, please call.

Respectfully submitted,

**Converse Consultants**

H. Edward Dawson, P.E., M.B.A.
Senior Staff Engineer

Kathi Brandmueller, P.E.
Senior Engineer/Office Manager

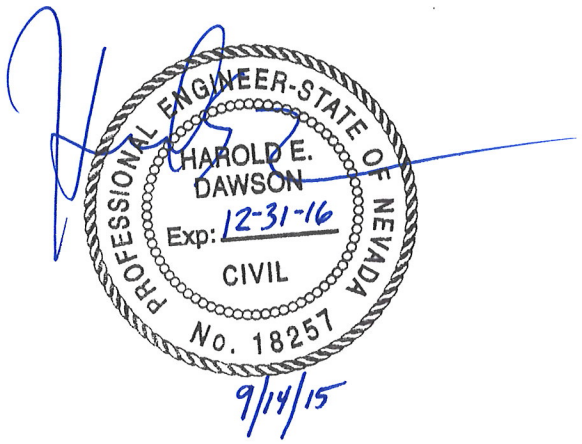


4840 Mill Street, Suite 5, Reno, Nevada 89502
Telephone: (775) 856-3833 ◆ Facsimile: (775) 856-3513 ◆ email: reno@converseconsultants.com

## PROFESSIONAL CERTIFICATION

This report has been prepared by the staff of Converse Consultants under the professional supervision of the registered engineer(s) whose seals and signatures appear hereon.

The findings, recommendations and professional opinions presented in this report were prepared in accordance with generally accepted professional engineering practice at this time in the State of Nevada. There is no other warranty, either expressed or implied.




H. Edward Dawson, P.E.
Senior Staff Engineer

# FEASIBILITY GEOTECHNICAL INVESTIGATION
# APN #534-571-01
# Spanish Springs, Nevada

## PROJECT DESCRIPTION

The project site is located near the corner of Nevada State Route 445, Pyramid Highway and Calle de la Plata and fronts Campo Rico Lane. The site is rectangular shaped. Proposed on the site is a 172 home subdivision. The size of the proposed project site is 58.487 acres. The property has an average elevation of approximately 4557 feet. Due to the flat topography of the site, relatively light structural loads and minimal cuts and/or fills are anticipated.

## SITE DESCRIPTION

The site description is based on our field observations and information provided by you. We have included a vicinity map depicting the location of the proposed project as "Drawing No. 1."

Currently, the site is relatively flat, sloping slightly from east to west, and is vacant with native vegetation consisting of sagebrush. Near the southern boundary of the parcel is an approximate 3 or 4 foot deep drainage ditch running in an east-west direction. The project site is located in an area of single family homes and warehouses. Adjacent to the site is non-developed land and single family homes.

## GEOLOGY AND GEOLOGIC HAZARDS

### Geology

As shown on the "Geologic Map of Washoe and Storey Counties, Nevada" (Bonham, 1969) the site is underlain by Quaternary Alluvium deposits consisting of stream deposits, talus, slop wash, alluvial fan and eolian deposits. Soils consist of gravel, sand, clay and silt mixtures.

### Faulting

The project site as well as all of Reno and Sparks is located near active faults which are considered capable of producing significant ground motion due to seismic events. Based on the USGS Quaternary Fault Fold Database, there are no known active faults (Holocene-age, exhibiting displacement with the last 11,000 years) crossing the subject site.

### Liquefaction

The site also appears to be outside any zones prone to seismically-induced liquefaction. Liquefaction of granular soils is caused by strong earthquake motion on loose saturated granular soils. The depth to groundwater is approximately 135 feet below ground surface. The probability of liquefaction is very low in the site area.

## FIELD INVESTIGATION AND SOIL CONDITIONS

Five hand-auger borings were advanced to a maximum depth of 3 feet at the site as shown on the attached Drawing No. 1 titled "Boring Location Map". Soils in the hand auger borings were relatively consistent with the Natural Resources Conservation Service (NRCS) mapping and related data calling it sandy loam consistent with alluvial deposits. Sandy loam is typically comprised of sand, silt, and small amounts of clay. The soils observed in the hand auger excavations consisted of silty sands, silty sand with gravel, clayey sand, poorly graded sand, and well graded sand with gravel. These alluvial deposits were loose in some areas and dense in others and all were dry at the surface and slightly moist with depth. Soils were field classified. Refer to Appendix A for representation of all hand auger borings.

## LABORATORY ANALYSIS

Laboratory analysis was not included in our current scope of services. Laboratory testing will be required during the final geotechnical investigation.

## GROUNDWATER CONDITIONS

### Groundwater

Groundwater is not expected to be a constraint to development. Based on the State of Nevada Division of Water Resources interactive monitoring well website, there is a monitoring well approximately one-half mile to the south east with a consistent water elevation of approximately 135 feet below existing ground surface.

## FLOODING AND DEBRIS FLOW

The Flood Insurance Rate Map (FIRM) produced by the Federal Emergency Management Agency (FEMA) shows the majority of the site lies in an area designated as Zone X. This area is determined to be outside of the 0.2% annual chance floodplain; however, Zone X is defined as “Areas of 0.2% annual chance flood; areas of 1% annual chance flood with

average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.” The southern portion of the site lies in an area of Zone AO which is within the 100 Year Flood zone. Zone AO is defined as “Flood depths of 1 to 3 feet (usually sheet flowing on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.”

A majority of the site lies in an area of Zone X; however, the Zone AO portion of the site will need to be mitigated during the Civil design phase of the project. Upon incorporating current drainage standards, flooding and debris flow should not be an issue. Below, Figure 1 depicts the zone designator areas for the parcel.

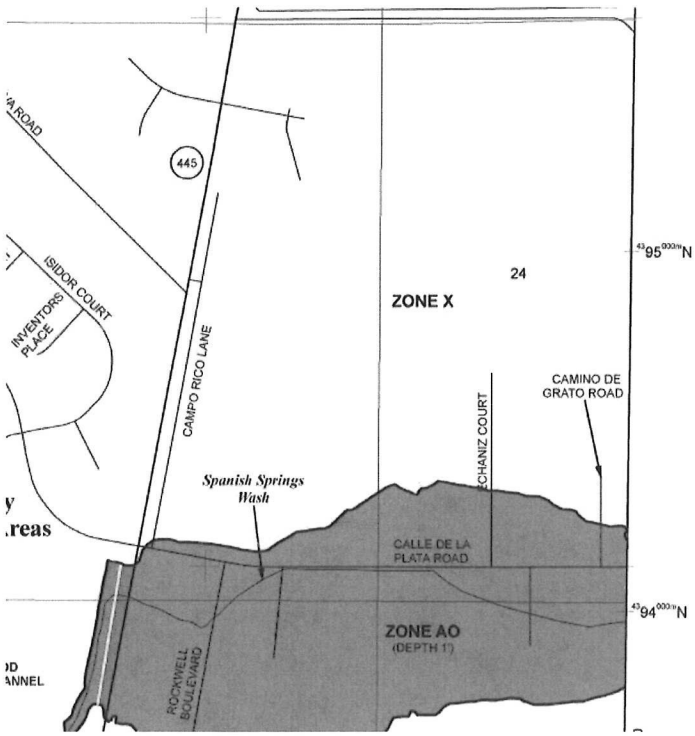



**FIGURE 1 – FIRM BY FEMA FOR PARCEL 534-571-01**

## ENGINEERING PROPERTIES OF SOILS

The engineering properties of the native soils observed are relatively good and should be generally suitable for the support of the structure proposed (to be verified through laboratory and field investigation performed during the Final Geotechnical Report). Some over excavation and re-compaction to provide uniform soil conditions beneath footings and slabs and to address any encountered expansive soils, should be anticipated.

## SLOPE STABILITY

No features that would indicate slope instability were observed.

## PRELIMINARY CONCLUSIONS

Based on our observations and research, it is our opinion that the proposed project is feasible from a geotechnical standpoint. Specific recommendations would be provided in the Final Geotechnical Investigation.

## CLOSURE

This report has been prepared for the sole benefit and exclusive use of the owner and project design team in accordance with the terms and conditions of our signed authorization under which these services have been provided. Any reliance on this report by third parties shall be at the third party's sole risk. Our services have been performed in

accordance with applicable state and local ordinances, and generally accepted practice within our profession. No warranty, either expressed or implied, is made.

Converse Consultants is not responsible or liable for any claims or damages associated with the interpretation of available information provided by others. Site exploration identifies actual soil conditions only at those points where samples are taken, or observations made, when they are performed. Data derived through sampling and analytical testing are extrapolated by Converse employees who then render an opinion about overall soil conditions. Actual conditions in areas not sampled, or observed, may differ. In the event that changes to the property occur, or additional, relevant information about the property is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed and the recommendation of this report are modified or verified in writing.

## REFERENCES

For the preparation of this document, the following documents were reviewed and websites accessed:


- Parcel Map, Washoe County Assessor's Office https://www.washoecounty.us/assessor/
- U.S. Geological Survey Quaternary Fault and Fold Database of the United States, accessed September 3, 2015 http://earthquake.usgs.gov/hazards/qfaults/
- State of Nevada Division of Water Resources – Nevada Hydrology Data on Monitoring Wells http://webgis.water.nv.gov/
- USDA & NRCS Custom Soil Resource Report for Washoe County, Nevada, South Part http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
- Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map #32031C2865G, retrieved from the following website http://msc.fema.gov/portal
- Geologic Map of Washoe and Storey Counties, Nevada, by Harold F. Bonham, 1969, Scale 1:250,000

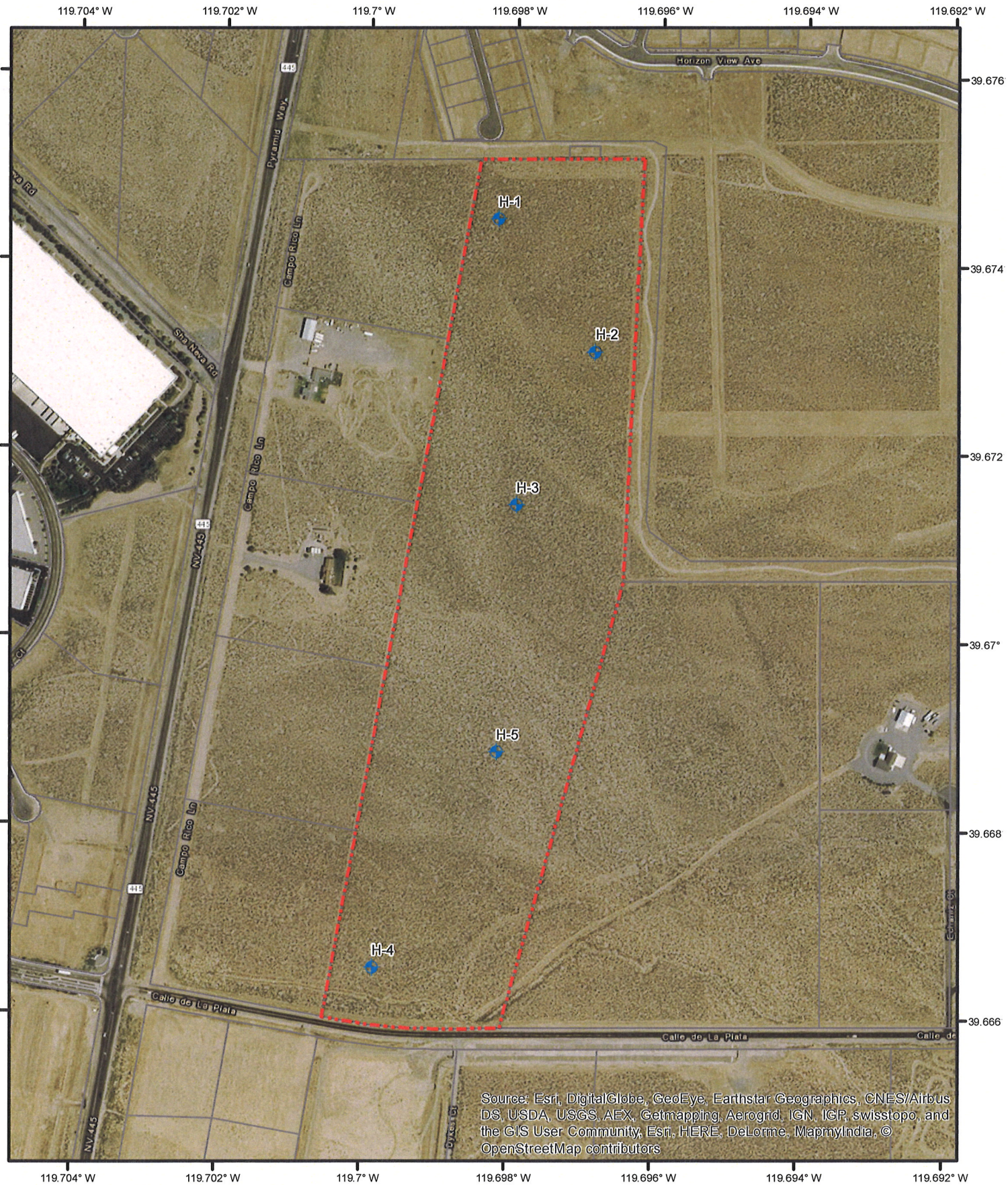

# VICINITY MAP

RUBICON DESIGN GROUP
Parcel # 534-571-01
Reno, Nevada

0 1 2 4 Miles

Converse Consultants
Over 60 Years of Dedication and Geotechnical and Environmental Services

| | |
|---|---|
| Scale | 1 inch = 2 miles |
| File Name | Vicinity Map |
| Date | 09/10/15 |
| Project No. | 15-25114-01 |
| Created By | KJP |
| Drawing No. | 1 |
| Checked By | ED |
| Approved By | |




# BORING LOCATION MAP

## RUBICON DESIGN GROUP

**Parcel #534-571-01**
**Reno, Nevada**

**Drawing No. 2**

N
W E
S

1 inch = 500 feet

0 500 1,000 Feet

**Legend**

- Boring Locations
- Project Boundary
- Washoe Parcels

Date: 09/10/15

Project No: 15-25114-01

# Log No. H-1

DRAFTED BY Ed Dawson

**Date of Drilling:** 9/8/2015 **Location:** Parcel 534-571-01 **Elevation (ft):** 4557 feet
**Driller:** N/A **Borehole Diameter:** 3 inch **Equipment:** Hand Auger
**Logged By:** Ed Dawson **Groundwater Depth (ft):** None Encountered **Driving Wt. and Drop:** N/A

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>**This log is part of the report prepared by Converse for this project and should be read with the report. This summary applies only at the location and time of the exploration. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplified model of the actual conditions encountered.** | Samples: Drive | Samples: Bulk | Samples: Blow Count | Drill Rate (sec/ft) | Moisture (%) | Dry Density (lb/cf) | Field or Lab Tests |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | SILTY SAND (SM), Light Brown, Medium Grained, Slightly Moist, Dense | | | | | | | |
| 1 | | SILTY SAND WITH GRAVEL (SM), Light Brown, Fine Grained Gravel, Slightly Moist, Subangular, Dense | | | | | | | |
| 2 | | Boring Terminated Due to Refusal | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

APPROVED BY ON

End of Exploration at 2.0'

Converse Sampler (white symbol=no recovery)

SPT Sampler (white symbol=no recovery)

**Parcel 534-571-01**
**Near the intersection of Pyramid Hwy and Calle de la Plata**
**Spanish Springs, Nevada**

**Project No.**
**15-25114-01**

**Converse Consultants**

Over 60 Years of Dedication in Engineering and Environmental Sciences

**Drawing No.**
**A-1**

# Log No. H-2

DRAFTED BY Ed Dawson

**Date of Drilling:** 9/8/2015 **Location:** Parcel 534-571-01 **Elevation (ft):** 4557 feet
**Driller:** N/A **Borehole Diameter:** 3 inch **Equipment:** Hand Auger
**Logged By:** Ed Dawson **Groundwater Depth (ft):** None Encountered **Driving Wt. and Drop:** N/A

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read with the report. This summary applies only at the location and time of the exploration. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplified model of the actual conditions encountered. | Samples: Drive | Samples: Bulk | Samples: Blow Count | Drill Rate (sec/ft) | Moisture (%) | Dry Density (lb/cf) | Field or Lab Tests |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | SILTY SAND (SM), Light Brown, Medium Grained, Slightly Moist, Dense | | | | | | | |
| 1 | | SILTY SAND WITH GRAVEL (SM), Light Brown, Medium Grained Sand, Fine Grained Gravel, Slightly Moist, Dense Subangular | | | | | | | |
| | | Boring Terminated Due to Refusal | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

APPROVED BY ON

End of Exploration at 1.5'

Converse Sampler (white symbol=no recovery)

SPT Sampler (white symbol=no recovery)

**Parcel 534-571-01**
**Near the intersection of Pyramid Hwy and Calle de la Plata**
**Spanish Springs, Nevada**

**Project No.**
**15-25114-01**

**Converse Consultants**

Over 60 Years of Dedication in Engineering and Environmental Sciences

**Drawing No.**
**A-2**

# Log No. H-3

DRAFTED BY Ed Dawson

**Date of Drilling:** 9/8/2015 **Location:** Parcel 534-571-01 **Elevation (ft):** 4557 feet
**Driller:** N/A **Borehole Diameter:** 3 inch **Equipment:** Hand Auger
**Logged By:** Ed Dawson **Groundwater Depth (ft):** None Encountered **Driving Wt. and Drop:** N/A

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>**This log is part of the report prepared by Converse for this project and should be read with the report. This summary applies only at the location and time of the exploration. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplified model of the actual conditions encountered.** | Samples: Drive | Samples: Bulk | Samples: Blow Count | Drill Rate (sec/ft) | Moisture (%) | Dry Density (lb/cf) | Field or Lab Tests |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | SILTY, CLAYEY SAND (SC-SM), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 1 | | CLAYEY SAND (SC), Light Brown, Medium Grained, Slightly Moist, Dense | | | | | | | |
| 2 | | Boring Terminated Due to Refusal | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

APPROVED BY ON

End of Exploration at 2.0'

Converse Sampler (white symbol=no recovery)

SPT Sampler (white symbol=no recovery)

**Parcel 534-571-01**
**Near the intersection of Pyramid Hwy and Calle de la Plata**
**Spanish Springs, Nevada**

**Project No.**
**15-25114-01**

**Converse Consultants**

Over 60 Years of Dedication in Engineering and Environmental Sciences

**Drawing No.**
**A-3**

# Log No. H-4

DRAFTED BY Ed Dawson

**Date of Drilling:** 9/8/2015 **Location:** Parcel 534-571-01 **Elevation (ft):** 4557 feet
**Driller:** N/A **Borehole Diameter:** 3 inch **Equipment:** Hand Auger
**Logged By:** Ed Dawson **Groundwater Depth (ft):** None Encountered **Driving Wt. and Drop:** N/A

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read with the report. This summary applies only at the location and time of the exploration. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplified model of the actual conditions encountered. | Samples: Drive | Samples: Bulk | Samples: Blow Count | Drill Rate (sec/ft) | Moisture (%) | Dry Density (lb/cf) | Field or Lab Tests |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | POORLY GRADED SAND WITH SILT (SP), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 1 | | POORLY GRADED SAND (SP), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 2 | | WELL GRADED SAND (SW), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 3 | | Boring Terminated | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

APPROVED BY ON

End of Exploration at 3.0'

Converse Sampler (white symbol=no recovery)

SPT Sampler (white symbol=no recovery)

**Parcel 534-571-01**
**Near the intersection of Pyramid Hwy and Calle de la Plata**
**Spanish Springs, Nevada**

**Project No.**
**15-25114-01**

**Converse Consultants**

Over 60 Years of Dedication in Engineering and Environmental Sciences

**Drawing No.**
**A-4**

# Log No. H-5

DRAFTED BY Ed Dawson

**Date of Drilling:** 9/8/2015 **Location:** Parcel 534-571-01 **Elevation (ft):** 4557 feet
**Driller:** N/A **Borehole Diameter:** 3 inch **Equipment:** Hand Auger
**Logged By:** Ed Dawson **Groundwater Depth (ft):** None Encountered **Driving Wt. and Drop:** N/A

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read with the report. This summary applies only at the location and time of the exploration. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplified model of the actual conditions encountered. | Samples: Drive | Samples: Bulk | Samples: Blow Count | Drill Rate (sec/ft) | Moisture (%) | Dry Density (lb/cf) | Field or Lab Tests |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | POORLY GRADED SAND WITH SILT (SP), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 1 | | POORLY GRADED SAND (SP), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 2 | | WELL GRADED SAND (SW), Light Brown, Medium Grained, Slightly Moist | | | | | | | |
| 3 | | Boring Terminated | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

APPROVED BY ON

End of Exploration at 3.0'

Converse Sampler (white symbol=no recovery)

SPT Sampler (white symbol=no recovery)

**Parcel 534-571-01**
**Near the intersection of Pyramid Hwy and Calle de la Plata**
**Spanish Springs, Nevada**

**Project No.**
**15-25114-01**

**Converse Consultants**

Over 60 Years of Dedication in Engineering and Environmental Sciences

**Drawing No.**
**A-5**

# KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty Sands, sand -silt mixtures (SM)

Silty Sand with Gravel

Silty Clayey Sand

Clayey Sand

PG Sand with Silt

Poorly Graded Sand with Gravel and Silt (SP)

WG Sand

Soil Samplers

Auger

Notes:

1.Five hand auger borings (H-1 through H-5) were drilled on 9/8/15.

2. Groundwater was not encountered during our investigation.

3. Boring locations are approximate.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.