BLACKSTONE ESTATES

TENTATIVE SUBDIVISION MAP APPLICATION

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Prepared by:

RUBICON DESIGN GROUP

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Introduction

This application includes the following request:

- A **Tentative Map with Common Open Space** to create 161 single family lots on 58.49± acres within the Spanish Springs Area Plan.

Project Location

The Blackstone 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.

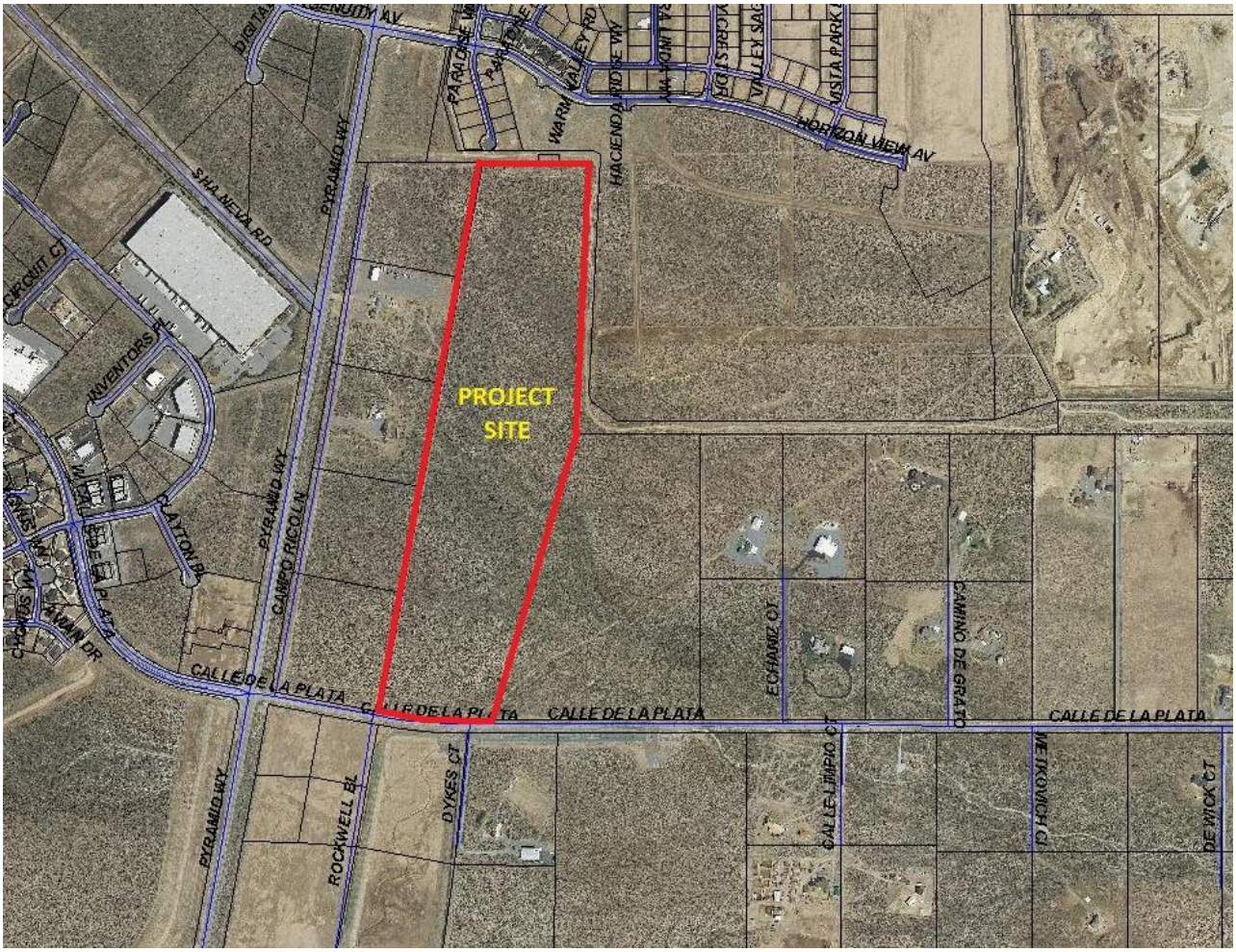


Figure 1 – Vicinity Map

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 Blackstone 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.

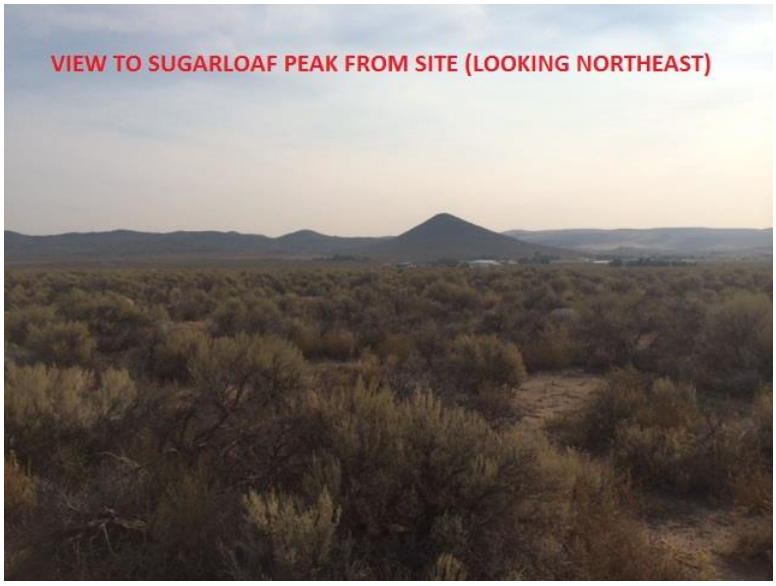
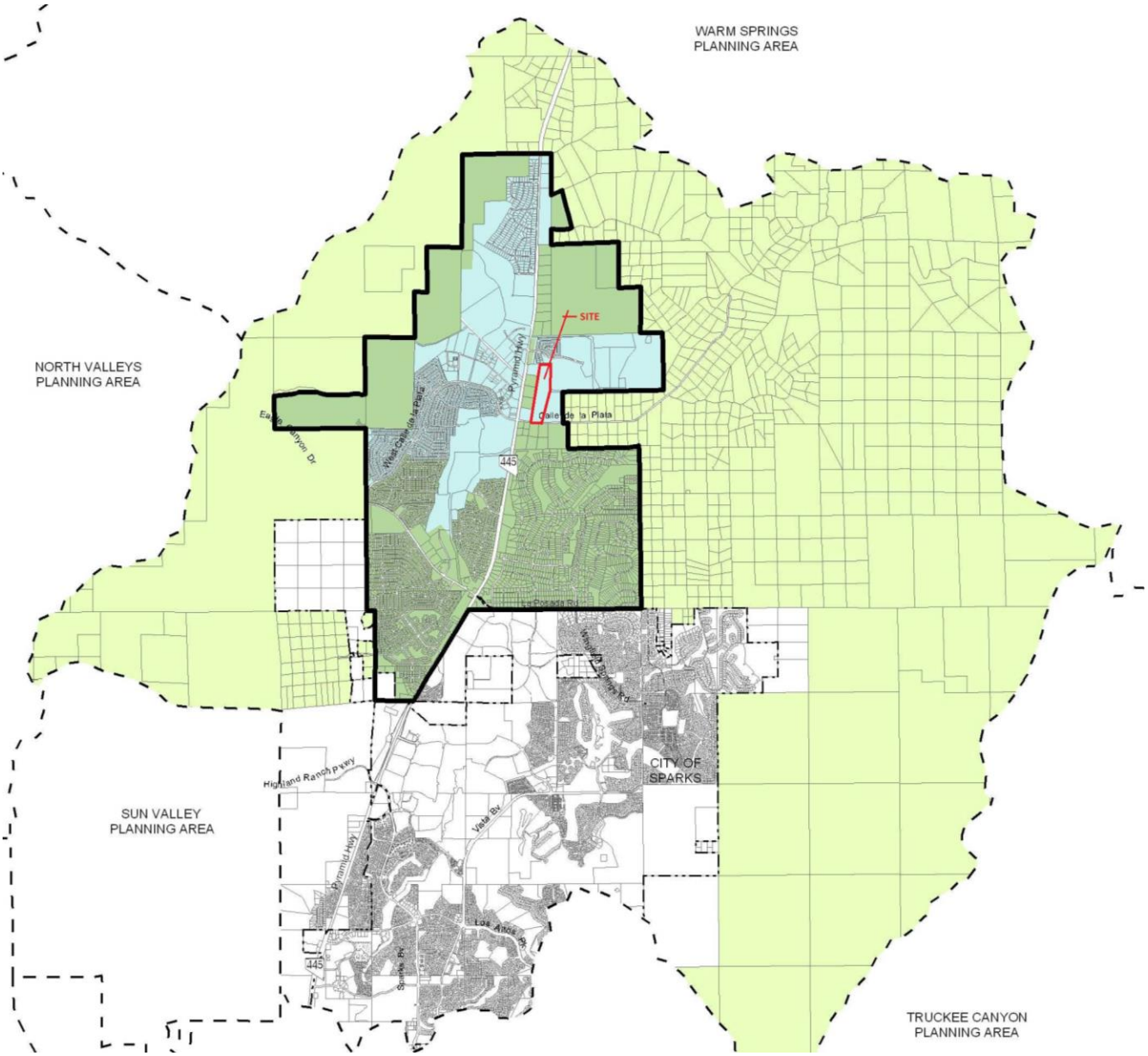


Figure 2 – Existing Conditions

Figure 3 – Existing Conditions

Blackstone 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

Previous Entitlement Requests

This tentative map application follows requests made for a Master Plan Amendment and Regulatory Zone Amendment for the Blackstone Estates site in September 2015. These applications have been approved by the Washoe County Board of Commissioners. Final conformance review approval by the Truckee Meadows Regional Planning Commission is anticipated on July 13, 2016.

The previous MPA and RZA requests set out to establish a Suburban Residential Master Plan designation and Medium Density Suburban (MDS) zoning for the entire 58.49± acres. The proposed Master Plan designations are depicted below in Figure 5, while Figure 6 (following page) depicts the proposed zoning for the project site.

It is important to note that the previous entitlement requests referred to the project as Sugarloaf Estates. The project name has officially been changed to Blackstone Estates in order to eliminate confusion between this project and the project proposed adjacent to this site (Sugarloaf Ranch Estates).

Figure 5 – Proposed Master Plan Designation

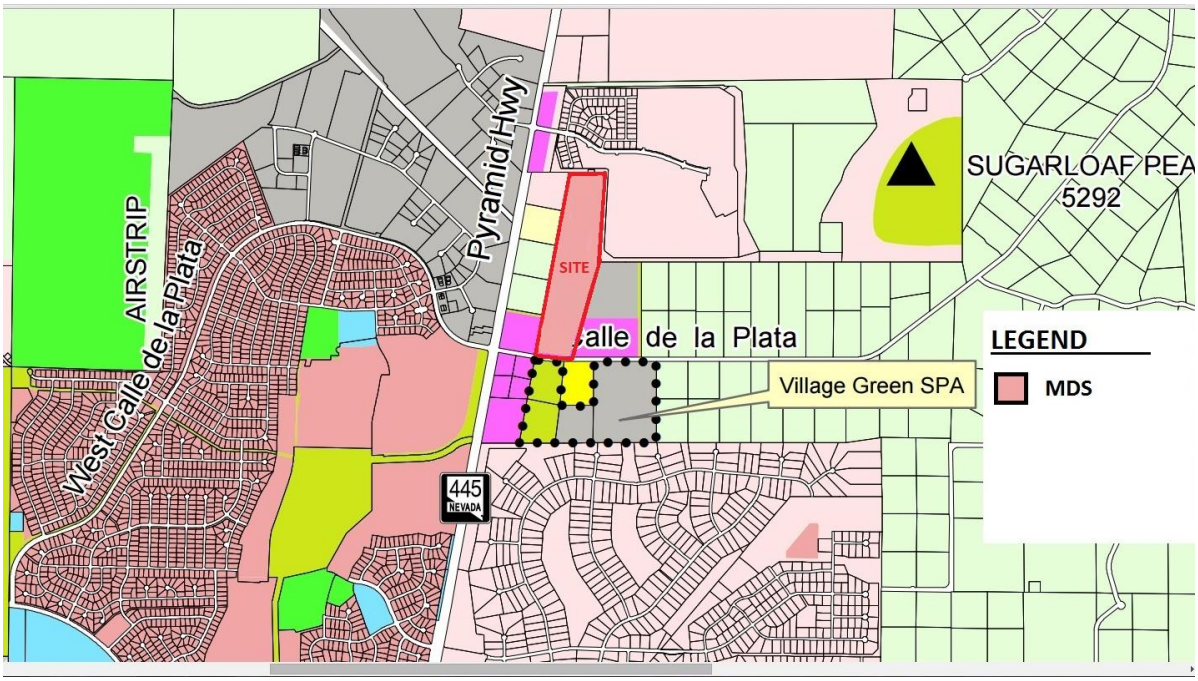


Figure 6 – Proposed Zoning

Request Summary

As noted previously, this application includes a tentative Subdivision Map request to create 161 single family lots at the project site. It is planned to develop Blackstone Estates utilizing a Common Open Space Development approach, per the standards contained in Article 408 of the Washoe County Development Code.

The plan developed for Blackstone Estates includes 161 lots for an overall density of 2.75 units per acre. Included within the project are 9.27± acres of open space. This includes a 3.19± acre open space area on the west side that will provide passive and active recreational opportunities for residents. It is envisioned that this area will serve much like a neighborhood park and can accommodate a wide range of recreational uses.

The park area on the west side of the project was located based on meetings with the adjoining property owner. At the owner's request, the open space was strategically located to ensure that a maximum buffer to the existing residence is achieved. It is also noteworthy that no motorized vehicles will be allowed in this area and the entire western row of lots will not include any two-story homes.

Lot sizes within Blackstone Estates are consistent with the proposed MDS zoning and are complementary to the existing Shadow Mountain subdivision to the north as well as lots planned within the proposed Sugarloaf Ranch Estates project to the east. Lots within Blackstone Estates range in size from 8,595± square feet to 19,271± square feet with an overall average lot size of 11,140± square feet.

Figure 7 (below) depicts the overall layout proposed for Blackstone Estates.

Figure 7 – Preliminary Site Plan

As depicted in Figure 7, trails will be provided with Blackstone Estates. These trails provide connections to existing trails within the adjoining developments as well as a connection to the existing regional trail that provides access to Sugarloaf Peak to the northeast. Although the trails and open space areas within Blackstone Estates will be private and maintained by a planned homeowners association, a public use easement will be dedicated in order to allow all area residents access to these amenities. Providing these trail linkages serves to complete a crucial link between Sugalrloaf Peak and the southern Spanish Springs valley. The trails can be used for walking/hiking, bicycling, or equestrian use.

A homeowners association (HOA) will be created for Blackstone Estates with the approval of the first final map. The HOA will be responsible for maintaining the open space and common areas and for enforcement of planned covenants, conditions, and restrictions (CC&R's). CC&R's will be developed for the site to ensure that homeowners maintain their properties and that the community vision is carried forward. The HOA may choose to form its own architectural review committee in order to further regulate any proposed modifications to homes (i.e. additions, patio covers, detached garages, etc.). Of course, any modification to the approved home plans would require compliance with the MDS zoning standards (i.e. setbacks, etc.) and would be subject to review and approval by Washoe County. The CC&R's are not enforced by the County but will provide the HOA with a mechanism to enforce the community standards and vision. The CC&R's will be provided to new home buyers at the time of purchase and will be recorded against new lots within Blackstone Estates.

Primary access will be provided from Calle de la Plata with a secondary access through the adjoining project (proposed) to the east. This will ensure proper emergency access and meets all applicable Washoe County requirements. A comprehensive traffic impact analysis is included as an appendix to this report and details the projected traffic volumes generated by Blackstone Estates and the planned mitigation improvements. As part of this project, it is proposed to improve the Pyramid Highway/Calle de la Plata intersection with a new dedicated left turn lane for southbound traffic onto Pyramid Highway.

Roadways within Blackstone Estates will be constructed to Washoe County standards and will be dedicated as public rights-of-way. Roads will include 42-foot right of way with curb, gutter, and sidewalk. Right-of-way details are included in the attached map pocket.

Phasing for the project will largely be dependent on current market conditions. It is envisioned that there will be no more than 5 phases for the project. Final maps may be recorded separately or concurrently for each phase and bonding for improvements shall occur in accordance with Washoe County requirements and policies. It is intended that the first phase will be located at the southern end of the project with construction moving to the north until buildout is complete.

Home plans for Blackstone Estates are still being developed and are envisioned to complement surrounding development. Larger lots included within Blackstone Estates are conducive to larger single story floor plans although no limitation on two-story models is proposed (with the exception of the west side). Consistent with Washoe County policy, final home plans and elevations will be subject to the review and approval of the Washoe County Design Review Committee for compliance with development code and Area Plan standards.

Fencing for the project will include six-foot wood fences for side and rear yards. Lots adjoining open space areas will include a 4-foot open fence such as split rail or wrought iron. These fencing requirements will also be included in the CC&R's recorded for Blackstone Estates.

Site Analysis

Article 408 of the Washoe County Development Code establishes regulations related to Common Open Space Developments (COSD). Specifically, Section 110.408.30 requires a site analysis be conducted. This site analysis criteria is listed below and addressed in **bold face** type.

Section 110.408.30 Site Analysis to Determine Common Open Space and Lot Size Variations. A site analysis showing development opportunities and constraints shall be prepared as a key consideration, along with the project design objectives, to determine the total area covered by lots and roads, lot areas, and the total area to be designated as common open space. The site analysis shall include information and maps, including a site opportunities and constraints map, describing all significant physical and contextual features or factors which may affect the development of the property. The elements of the site analysis shall include, as a minimum, the following information:

(a) Location Map. A general location map providing the context of location and vicinity of the site.

Figure 1 (page 1) included in this report provides an overall location/vicinity map for Blackstone Estates. Additionally, a vicinity map is also included on the Tentative Map Title Sheet (Sheet 1 of 9) in the attached map pocket.

(b) Land Use. Current and planned land use on the site and adjacent current, planned and approved, but unbuilt land uses.

As depicted in Figures 1 through 6 of this report, the project site is currently vacant. Requests for a Master Plan Amendment and Zone Change have been submitted that will redesignate the site as Suburban Residential and rezone the site to Medium Density Suburban (MDS). This is actually a down-zone to the current Neighborhood Commercial and Industrial designations that are currently associated with the property. Parcels to the north are under development as single family homes, utilizing a similar COSD approach as proposed with Blackstone Estates. Although the subdivision to the north is zoned Low Density Suburban, with the clustering, lot sizes are complementary to that proposed within Blackstone Estates. Parcels to the west are designated for a mix of commercial and residential uses (at varying densities). Two of the parcels to the west are developed with single family homes. The Blackstone Estates plan addresses these residences by providing an open space buffer adjacent to the parcels which will protect privacy and view sheds of the existing residences.

The property located to the east of Blackstone Estates is currently under review by Washoe County for single family residential use at the same density proposed with this project (Sugarloaf Peak Estates). Therefore, Blackstone Estates will directly complement uses to the east. If the Sugarloaf Peak Estates is not approved, Blackstone Estates will still retain the open space buffer and trail along the eastern property boundary, ensuring land use compatibility. Lastly, the property to the south consists of a large detention basin/regional flood control project that will remain undeveloped but is perfectly compatible with residential use types.

(c) Existing Structures. A description of the location, physical characteristics, condition and proposed use of any existing structures.

Not applicable. There are no existing onsite structures.

(d) Existing Vegetation. A description of existing vegetation, including limits of coverage, and major tree sizes and types. In the instance of heavily wooded sites, typical tree sizes, types and limits of tree coverage may be substituted.

The Blackstone Estates site is characterized by natural vegetation consisting mostly of sagebrush, rabbit brush, and patches of cheat grass. There are no existing trees on the property no are there any known foreign species, etc.

(e) Prevailing Winds. An analysis of prevailing winds.

Prevailing winds in the area are from west to east with occasional northerly winds during storm events. The proposed project layout should not be negatively impacted by the prevailing winds in the area.

(f) Topography. An analysis of slopes on the site using contour interval of five (5) feet, or at a contour interval appropriate for the site and agreed to by the Director of Community Development.

The project site is generally flat and contains 10± feet of fall across the entire 58.49± acres. The project does not qualify as a hillside development and contains slopes less than 5%. The engineering plans included with this application provide for grading and drainage plans that clearly depict the site topography.

(g) Soil. An analysis of the soil characteristics of the site using Soil Conservation Service (SCS) information.

A preliminary geotechnical report is included as an appendix to this report and identifies no soil or geologic conditions that would preclude residential development at the densities proposed.

(h) Natural Drainageways. Identification of natural drainageways on and adjacent to the site.

Natural drainage that occurs along the eastern portion of the site will be retained and is incorporated into the provided open space. A detailed hydrology study is also included as an appendix to this report.

(i) Wetlands and Water Bodies. Identification of existing or potential wetlands and water bodies on the site.

Not applicable. No wetlands or water bodies exist onsite.

(j) Flood Hazards. Identification of existing and potential flood hazards using Federal Emergency Management Agency (FEMA) information.

There is a small portion of flood hazard area that "clips" the southeastern portion of the Blackstone Estates site. This area is incorporated in to the open space and does not occur within any of the proposed lot areas. This area is also depicted on the engineering plans and addressed in the included hydrology report.

(k) Seismic Hazards. Identification of seismic hazards on or near the site, including location of Halocene faults.

A preliminary geotechnical report is included with this application and identifies no known seismic hazards.

(l) Avalanche Hazards. An analysis of avalanche and other landslide hazards.

Not applicable.

(m) Sensitive Habitat and Migration Routes. An analysis of sensitive habitat areas and migration routes.

Not applicable. There are no known or identified sensitive habitats or migration routes onsite.

(n) Significant Views. A description and analysis of all on and off site significant views.

Views from the site generally focus to the northeast towards Sugarloaf Peak. Views across the property are previously depicted in Figures 2 and 3.

(o) Easements. A description of the type and location of any easements on the site.

All existing and proposed easements are clearly depicted on the engineering plans included with this report. Additionally, a preliminary title report is being submitted with the original report that identifies and describes all existing easements.

(p) Utilities. A description of existing or available utilities, and an analysis of appropriate locations for water, power, sanitary sewer and storm water sewer services.

The attached engineering plans and drawings depict all existing utilities/infrastructure and proposed extensions, etc. The project will connect to all municipal services including sewer, water, natural gas, cable television, etc.

(q) Appropriate Access Points. An analysis of appropriate access points based upon existing and proposed streets and highways and site opportunities and constraints.

Access is provided from Calle de la Plata and primary access is situated and sized such that conflicts with existing driveways and circulation patterns will not result. A comprehensive traffic impact analysis is also included as an appendix to this report.

(r) Other Information. All other information deemed appropriate and necessary by the Director of Community Development.

This report provides for all pertinent and required details. Additional information and analysis can be provided on an as-needed basis as it may arise during the public review process.

As part of the Site Analysis required under the COSD standards, the Development Suitability Map from the Spanish Springs Area Plan was referenced. The site is considered "most suitable for development" with the exception of a small portion subject to flooding (as discussed previously under item "j"). The actual area subject to flooding has been highly refined based on detailed engineering studies and mapping provided by FEMA and is clearly addressed on the engineering plans included with this report.

Figure 8 (following page) includes the Development Suitability Map taken from the Spanish Springs Area Plan.

Potential Impacts

This section aims to provide a cursory impact analysis based on the conceptual plan developed for the project, as presented in Figure 7.

- **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.

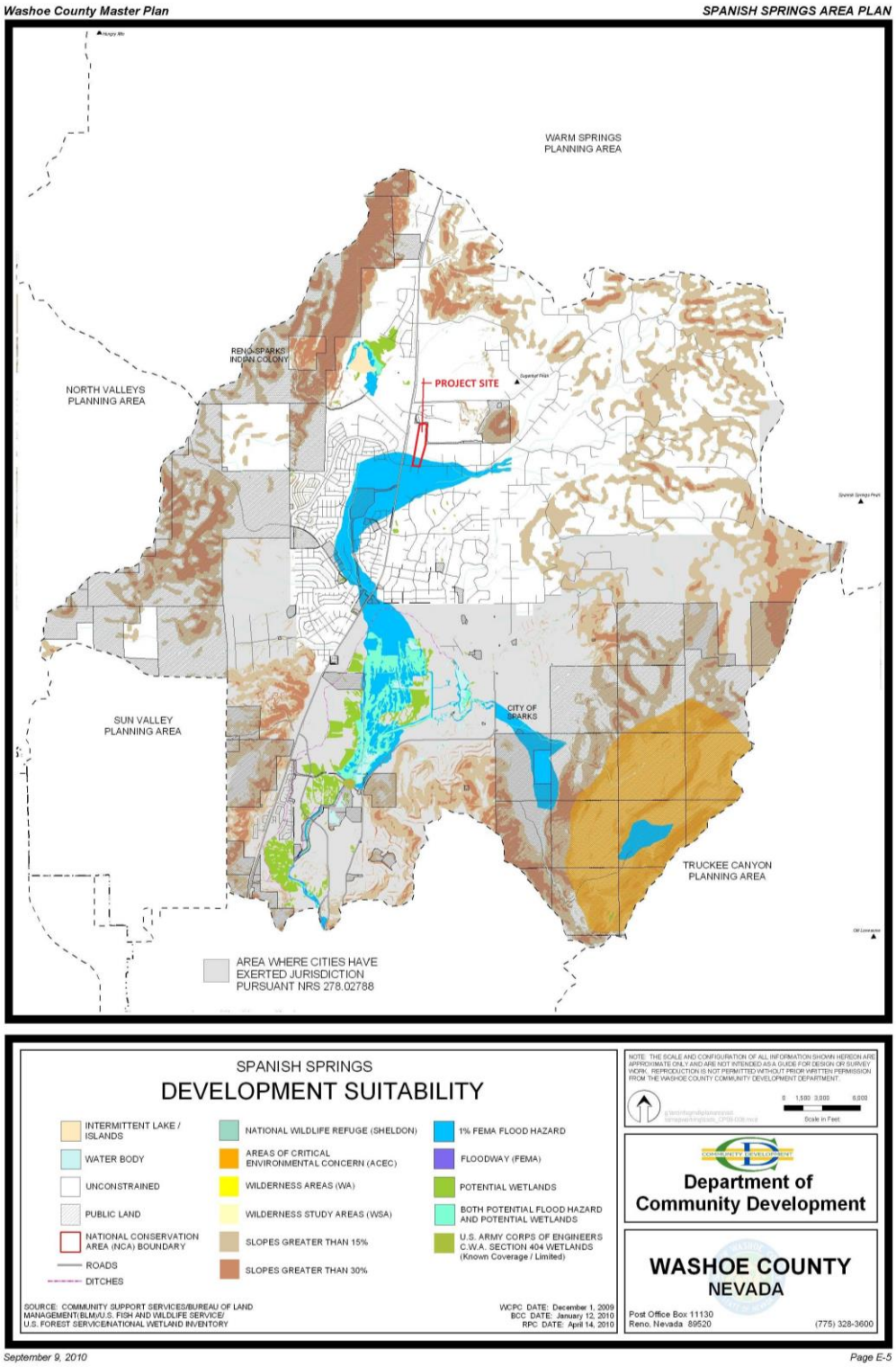


Figure 8 – Development Suitability Map

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 Blackstone Estates.

With approval of Blackstone 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 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, Blackstone Estates is anticipated to generate 121 am peak hour trips, 163 pm peak hour trips, and 1,541 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.

Blackstone 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.

- **Schools**

As part of this Tentative Map 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 161 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**	**45 students**
Shaw MS	**1,008 students**	**1,072 students**	**0.064/unit**	**10 students**
Spanish Springs HS	**2,315 students**	**2,160 students**	**0.136/unit**	**22 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 Blackstone Estates. Consistent with the policies of the Spanish Springs Area Plan and requirements of the Washoe County Development Code, all new lots within Blackstone Estates will be served by municipal water and sewer. 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 is analyzed with the preliminary engineering plans and reports included with this report and compliance is demonstrated.

Preliminary utility plans are included with the engineering plans located in the map pocket of this report.

- **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 recently requested MDS zoning represents a down zoning in terms of intensity from which is permitted under the prior commercial and industrial designations. 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 request must be reviewed for consistency with the goals and policies of the Washoe County Master Plan, Spanish Springs 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 Tentative Map request is entirely consistent with this intent of the Area Plan. Blackstone 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, the pending amendments to 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 argued 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 with Blackstone Estates, along with the planned open space 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 2.75 du/ac density proposed with Blackstone 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.

As noted previously, 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 proposed with Blackstone Estates are consistent with the 3 du/ac suburban character (2.75 du/ac proposed) identified in the plan and most definitely provide for an appropriate transition to adjoining properties.

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 2.75 du/ac density proposed with Blackstone 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 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 Blackstone 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 Blackstone 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 request. These policies are listed below and are addressed in **bold face** type.

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, Blackstone 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.*

Blackstone Estates, at build out, represents 161 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 161 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. Blackstone 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.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 the proposed 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.

Blackstone 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 Blackstone 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 Blackstone 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 Blackstone Estates site is ideal for development at the densities proposed. 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 an appropriate transition between suburban uses and rural areas further east. Additionally, Blackstone Estates will provide a vital link in the regional trail network, a key component of the Area Plan.

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 Blackstone 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 7, Blackstone Estates will be developed in a clustered fashion that will provide for public trail connections from the site to the regional network. Additionally, land is preserved central to the project for active and passive recreation opportunities.

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 Blackstone Estates will be public and will support the users listed within this policy.

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 open space 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.*

Blackstone 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. Blackstone Estates provides a 3.9± acre central open space that can essentially function as a neighborhood park providing passive and active recreation opportunities 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.*

Blackstone Estates has already gone through the Truckee Meadows Water Authority's "Discovery" process. TMWA has confirmed that the site is within its service boundary and facilities to serve the proposed project are in place. Water rights are available for purchase through TMWA and will be dedicated to serve the project with final map(s).

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.

Blackstone Estates will comply with the requirements of this policy. Water rights will be purchased from TMWA or an approved supplier and dedicated to serve the project with final map(s). Truckee River water rights will be dedicated for this project.

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.

Blackstone Estates will comply with the requirements of this policy and will provide water rights with final map recordation per TMWA requirements and guidelines.

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 coordinated through the Truckee Meadows Water Authority.

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

Blackstone 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.

Blackstone 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.

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

The previous Master Plan Amendment and Regulatory Zone Amendment application for Blackstone Estates (filed September 15, 2015) included a comprehensive analysis of applicable Master Plan policies relevant to the project. As explained in that report, the proposed project (at the density/intensity proposed) is supported by the Master Plan and does not conflict with any current goals or policies.

Tentative Map Findings

Section 110.608.20 of the Washoe County Development Code establishes legal findings that must be made by the Planning Commission or Board of County Commissioners in order to approve a Tentative Map request. These findings are listed below and are addressed in **bold face** type.

(a) Environmental and Health Laws. Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal;

Blackstone Estates will be served by municipal water and sewer service, ensuring full compliance with this finding. Additionally, solid waste disposal service will be provided through Waste Management which currently operates routes in Spanish Springs and the surrounding areas.

(b) Availability of Water. The availability of water which meets applicable health standards as well as requirements for water rights, quality or will-serve commitments;

The project site is within the service boundary of the Truckee Meadows Water Authority and has completed a Discovery process through TMWA. Water rights will be dedicated to TMWA to serve the project, ensuring full compliance with this finding. Water rights can be purchased directly from TMWA or on the open market (with full TMWA acceptance).

(c) Utilities. The availability and accessibility of utilities;

The project will be served by all municipal utilities, infrastructure, and services as detailed within this report and on the attached engineering plans.

(d) Public Services. The availability and accessibility of public services such as schools, police and fire protection, transportation, recreation and parks;

The project is within an acceptable response time of the Truckee Meadows Fire Protection District's station on La Posada Drive and is in an area of existing Sherriff patrols. Schools that will serve the project along with their current enrollments are detailed within this report. It is further recognized that it will be disclosed to all new residents (at time of purchase) that school zoning is subject to change based on current enrollments, capacities, etc.

(e) Plan Consistency. General conformance with the Development Code and Master Plan;

With the approval of the pending Master Plan Amendment and Regulatory Zone Amendment requests, Blackstone Estates will be in direct conformance with the Suburban Residential Master Plan designation and Medium Density Suburban zoning.

(f) Impact on Existing Streets. The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision;

A detailed traffic impact analysis is included with this application and identifies improvements needed to mitigate traffic impacts created by Blackstone Estates. These improvements can be conditioned with the Tentative Map and must be completed prior to the issuance of certificates of occupancy for new homes. This will ensure full compliance with this finding.

(g) Physical Characteristics. Physical characteristics of the land such as flood plain, slope and soil;

The site is well suited for the type and intensity of development proposed. The site contains no slope or soil conditions that would preclude development nor does it contain any significant wildlife habitats, etc. The small area on the southeast corner of the site that is subject to flooding is incorporated into the provided open space and will not impact individual lots within the project.

(h) Agency Review. The recommendations and comments of the entities reviewing the tentative map; and

Copies of this report and the included plans will be circulated to all applicable reviewing agencies for review and comment. Specific requirements and relevant comments can be included as conditions tied to this request and implemented with final map(s).

(i) Impact on Existing Drainage System. The effect of the proposed subdivision on the existing natural and man-made drainage system.

The project will provide for onsite detention to ensure that no additional flows over what currently exist will occur from the site with development of Blackstone Estates. A highly detailed hydrology study is also included in the appendices of this report demonstrating compliance with all applicable Washoe County requirements related to drainage.

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: Blackstone Estates	
Project Description: A 161 unit tentative subdivision map with common open space.	
Project Address: 350 Calle de la Plata, Spanish Springs	
Project Area (acres or square feet): 58.5 acres	
Project Location (with point of reference to major cross streets **AND** area locator): North side of Calle de la Plata, just east of Pyramid Highway.	

Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No(s):	Parcel Acreage:
534-571-01	58.5 acres		

Section(s)/Township/Range: Section 23, T21N, R 20E

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 Douglas 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: 775-442-7576	Other:	Cell: 775-250-3455	Other:
Contact Person: Samuel Douglas		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: SP68, 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 30th 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 Flat St
Las Vegas, NV 89138

Subscribed and sworn to before me this 8th day of August 2015.

(Notary Stamp)

Notary Public in and for said county and state

My commission expires: 10/25/2017

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

Signed

Address 6201 Hollywood Blvd
LA 90028

Jennifer L Stanfield
Notary Public

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

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

My commission expires: 1.11.2018

*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.

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

My commission expires: November 25, 2017

(Notary Stamp)

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.)

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

[_____] SPRINGING POWER. Not applicable.

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

[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

Tentative Subdivision Map Application
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 tentative subdivision maps may be found in Article 608, Tentative Subdivision Maps.

1. What is the location (address or distance and direction from nearest intersection)?

350 Calle de la Plata

Primary subdivision entrance is proposed approximately 1400 feet east of the Pyramid Highway/Calle de la Plata intersection.

2. What is the subdivision name (proposed name must not duplicate the name of any existing subdivision)?

Blackstone Estates

3. Density and lot design:

a. Acreage of project site	58.5 acres
b. Total number of lots	161
c. Dwelling units per acre	2.75
d. Minimum and maximum area of proposed lots	8,595 sq.ft./19,271sq.ft.
e. Minimum width of proposed lots	70'
f. Average lot size	11,140 sq.ft.

4. Utilities:

a. Sewer Service	Washoe County
b. Electrical Service	NV Energy
c. Telephone Service	ATT or Charter Communications
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	ATT or Charter Communications
g. Water Service	Truckee Meadows Water Authority

5. For common open space subdivisions (Article 408), please answer the following:

   a. Acreage of common open space:

   9.27 acres

   b. Development constraints within common open space (slope, wetlands, faults, springs, ridgelines):

   The elongated shape of the parcel provides a constraint and opportunity. The opportunity to provide a large park for the development requires lots to be slightly smaller. Refer to attached report for a detailed analysis.

   c. Range of lot sizes (include minimum and maximum lot size):

   8,595 sq.ft. - 19,271 sq.ft.

   d. Average lot size:

   11,140 sq.ft.

   e. Proposed yard setbacks if different from standard:

   Front = 20'
   Side = 8'
   Rear = 20'

   f. Justification for setback reduction or increase, if requested:

   N/A

   g. Identify all proposed non-residential uses:

   N/A

h. Improvements proposed for the common open space:

The large central common open spaces (Common Area A) is proposed as a neighborhood park.

i. Describe or show on the tentative map any public or private trail systems within common open space of the development:

Public sidewalks are provided throughout the subdivision to connect pedestrians to the adjacent trail system and common areas. In addition, a trail is proposed through the central park area as well as northerly to the existing trail.

j. Describe the connectivity of the proposed trail system with existing trails or open space adjacent to or near the property:

As shown on the tentative map, the proposed development is connecting with the existing trail system in two locations: to the north and to the east. Both connections are through public right-of-way or easement.

k. If there are ridgelines on the property, how are they protected from development?

Ridgelines are not present on the property.

l. Will fencing be allowed on lot lines or restricted? If so, how?

Fencing will be allowed on the lot lines.

m. Identify the party responsible for maintenance of the common open space:

The common open space will be privately maintained by the subdivisions home owner's association.

6. Is the project adjacent to public lands or impacted by "Presumed Public Roads" as shown on the adopted April 27, 1999 Presumed Public Roads (see Washoe County Engineering website at http://www.washoecounty.us/pubworks/engineering.htm). If so, how is access to those features provided?

This project is not impacted by "Presumed Public Roads". The project is adjacent to a public trail system to the north and east with access to those features provided via public and private trail and sidewalk systems.

7. Is the parcel within the Truckee Meadows Service Area?

☑ Yes	☐ No

8. Is the parcel within the Cooperative Planning Area as defined by the Regional Plan?

☐ Yes	☑ No	If yes, within what city?

9. Will a special use permit be required for utility improvement? If so, what special use permits are required and are they submitted with the application package?

To our knowledge, a special use permit will not be required for utility improvements.

10. Has an archeological survey been reviewed and approved by SHPO on the property? If yes, what were the findings?

To our knowledge, an archaeological survey has not been completed or reviewed by SHPO.

11. Indicate the type and quantity of water rights the application has or proposes to have available:

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):

Refer to attached TMWA Discovery Report

12. Describe the aspects of the tentative subdivision that contribute to energy conservation:

To the extent possible, solar orientation will be a consideration in the placement of building envelopes.

13. Is the subject property in an area identified by Planning and Development as potentially containing rare or endangered plants and/or animals, critical breeding habitat, migration routes or winter range? If so, please list the species and describe what mitigation measures will be taken to prevent adverse impacts to the species:

The subject property is not known to be in an area identified as potentially containing rare or endangered plants or animals, critical breeding habitat, migration routes or winter range.

There is an area of FEMA floodplain located at the far southeast corner of the subject property. This area is proposed to be left largely undisturbed with the exception of the culvert/road crossing.

14. If private roads are proposed, will the community be gated? If so, is a public trail system easement provided through the subdivision?

The proposed roads are public.

15. Is the subject property located adjacent to an existing residential subdivision? If so, describe how the tentative map complies with each additional adopted policy and code requirement of Article 434, Regional Development Standards within Cooperative Planning Areas and all of Washoe County, in particular, grading within 50 and 200 feet of the adjacent developed properties under 5 acres and parcel matching criteria:

The subject property is not located adjacent to an existing residential subdivision.

16. Are there any applicable policies of the adopted area plan in which the project is located that require compliance? If so, which policies and how does the project comply?

N/A

17. Are there any applicable area plan modifiers in the Development Code in which the project is located that require compliance? If so, which modifiers and how does the project comply?

N/A

18. Will the project be completed in one phase or is phasing planned? If so, please provide that phasing plan:

The project is proposed to be completed as one phase.

19. Is the project subject to Article 424, Hillside Development? If yes, please address all requirements of the Hillside Ordinance in a separate set of attachments and maps.

☐ Yes	☑ No	If yes, include a separate set of attachments and maps.

20. Is the project subject to Article 418, Significant Hydrologic Resources? If yes, please address Special Review Considerations within Section 110.418.30 in a separate attachment.

☐ Yes	☑ No	If yes, include separate attachments.

Grading

Please complete the following additional questions if the project anticipates grading that involves: (1) Disturbed area exceeding twenty-five thousand (25,000) square feet not covered by streets, buildings and landscaping; (2) More than one thousand (1,000) cubic yards of earth to be imported and placed as fill in a special flood hazard area; (3) More than five thousand (5,000) cubic yards of earth to be imported and placed as fill; (4) More than one thousand (1,000) cubic yards to be excavated, whether or not the earth will be exported from the property; or (5) If a permanent earthen structure will be established over four and one-half (4.5) feet high:

21. How many cubic yards of material are you proposing to excavate on site?

26,600 cy

22. How many cubic yards of material are you exporting or importing? If exporting of material is anticipated, where will the material be sent? If the disposal site is within unincorporated Washoe County, what measures will be taken for erosion control and revegetation at the site? If none, how are you balancing the work on-site?

We are proposing to use the material cut from the common areas and drainage channels to fill the pads as necessary. Although a small import may be necessary to account for unexpected soil losses during construction, generally the earthwork on this site will balance.

23. Can the disturbed area be seen from off-site? If yes, from which directions, and which properties or roadways? What measures will be taken to mitigate their impacts?

The disturbed areas could be visible from all property lines. The most significant impacts will occur along Calle de la Plata at the entrance road.

24. What is the slope (Horizontal:Vertical) of the cut and fill areas proposed to be? What methods will be used to prevent erosion until the revegetation is established?

The maximum proposed slope is 3:1. The area will be covered in straw and BMPs will be maintained until such time that the revegetaion work is established.

25. Are you planning any berms and, if so, how tall is the berm at its highest? How will it be stabilized and/or revegetated?

Berms are not proposed.

26. Are retaining walls going to be required? If so, how high will the walls be, will there be multiple walls with intervening terracing, and what is the wall construction (i.e. rockery, concrete, timber, manufactured block)? How will the visual impacts be mitigated?

Retaining walls are not proposed.

Request to Reserve New Street Name(s)

The Applicant is responsible for all sign costs.

Applicant Information

Name: Jacie, LLC - c/o Douglas Properties, LLC

Address: 3820 Lone Tree Lane

Reno, NV 89509

Phone : (775) 352-4200 Fax: _____

☑ Private Citizen ☐ Agency/Organization

Street Name Requests

(No more than 14 letters or 15 if there is an "i" in the name. Attach extra sheet if necessary.)

Lily Way	Lily Lane
Alexis Way	Alexis Lane
Joshua Tree Way	Joshua Tree Lane

If final recordation has not occurred within one (1) year, it is necessary to submit a written request for extension to the coordinator prior to the expiration date of the original

Location

Project Name: Blackstone Estates

☐ Reno ☐ Sparks ☑ Washoe County

Parcel Numbers: 534-571-01

☑ Subdivision ☐ Parcelization ☐ Private Street

Please attach maps, petitions and supplementary information.

Approved: _____ Date: _____

Regional Street Naming Coordinator

☐ Except where noted

Denied: _____ Date: _____

Regional Street Naming Coordinator

Washoe County Geographic Information Services

Post Office Box 11130 - 1001 E. Ninth Street

Reno, NV 89520-0027

Phone: (775) 328-2325 - Fax: (775) 328-6133

Washoe County Treasurer
Tammi Davis

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

Account Detail

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

Washoe County Parcel Information

Parcel ID	Status	Last Update
53457101	Active	10/14/2015 2:12:25 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

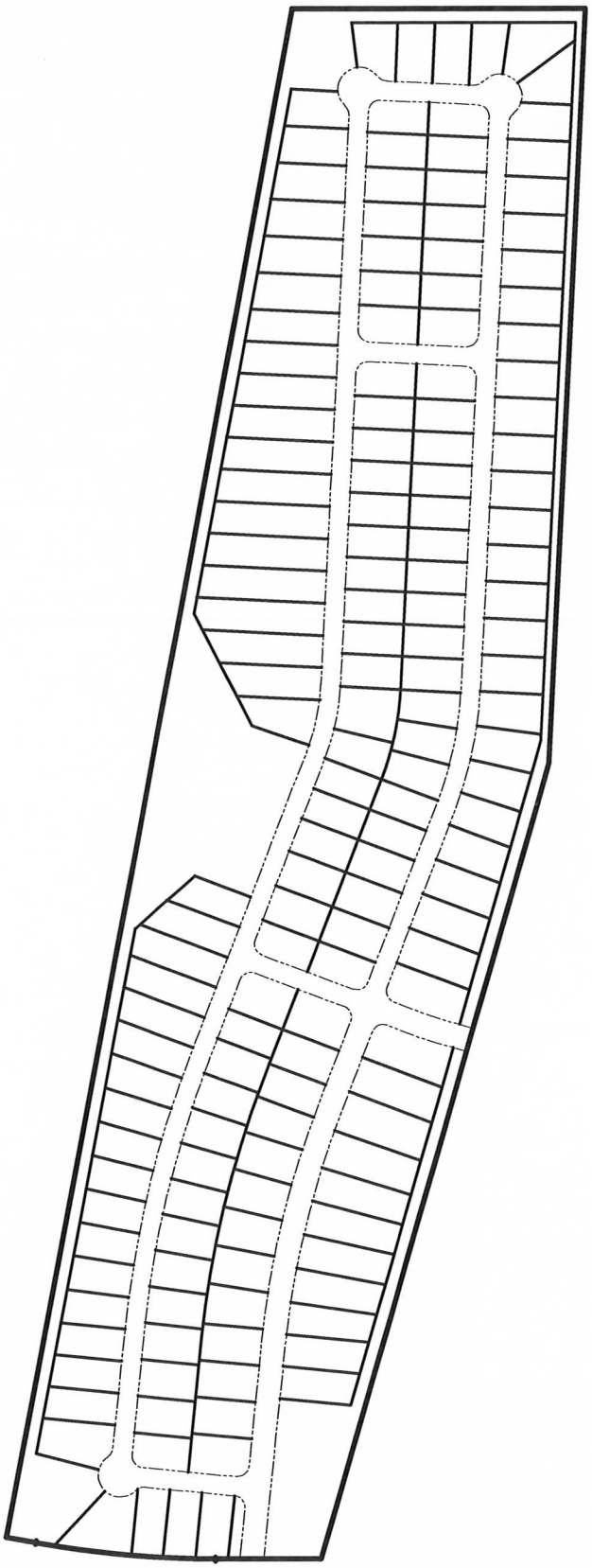
Installment Date Information

Assessment Information

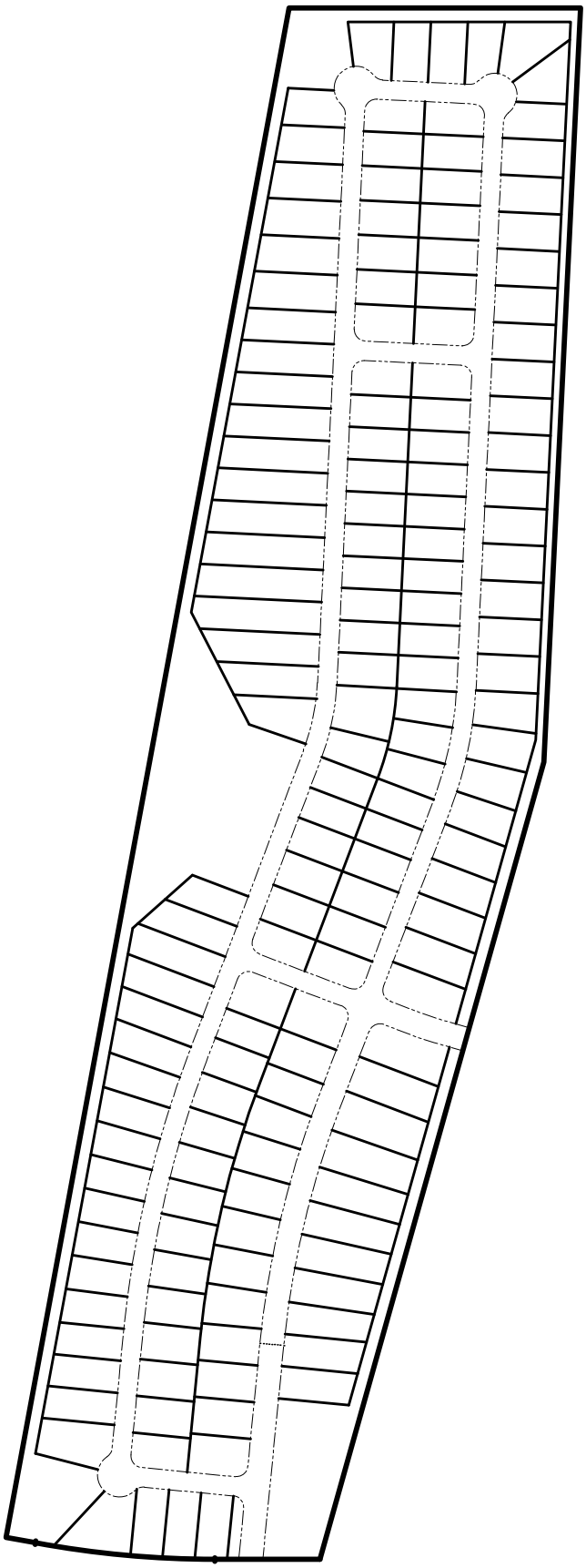
Important Payment Information

- 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.

WASHOE COUNTY ASSESSOR'S OFFICE MAP



WASHOE COUNTY ASSESSOR'S OFFICE MAP



TRAFFIC IMPACT STUDY

FOR

BLACKSTONE ESTATES (LOTS 1-161)

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

BLACKSTONE ESTATES (LOTS 1-161)

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

TABLE OF CONTENTS

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 2.75 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 1,541 daily, 121 AM peak hour, and 163 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 2.75 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 163 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
   121 morning peak hour trips
   163 evening peak hour trips
   1,541 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 53% 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 maximum 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.

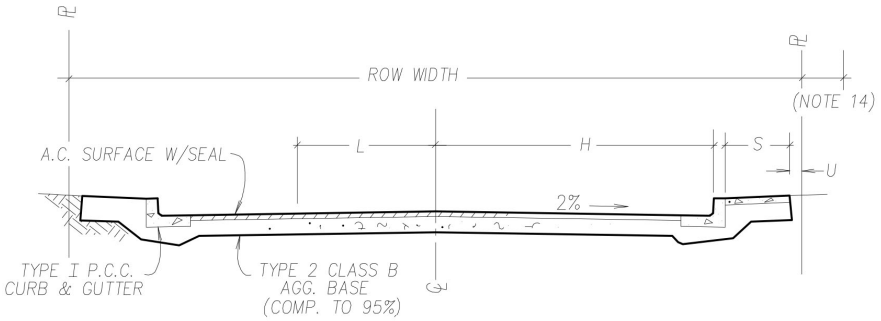
The use of a standard cul-de-sac, per Washoe County standard drawing W-7, is required at any end sections of roadway. This may be used as a temporary feature for phased development or as a permanent paved turnaround as needed for site design.

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

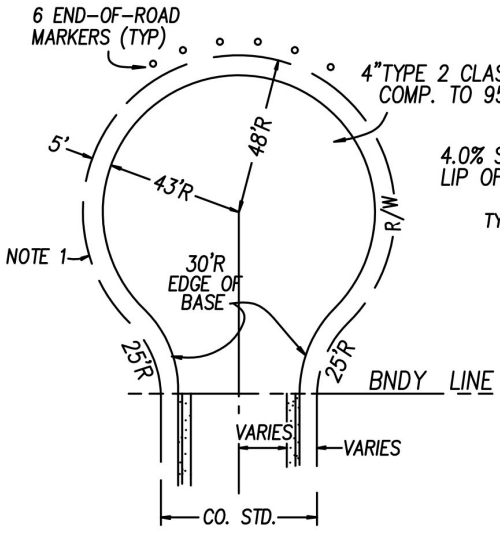
URBAN AREAS/SUBURBAN AREAS

LOT SIZE: LESS THAN 0.5 ACRE

SECTION: WASHOE

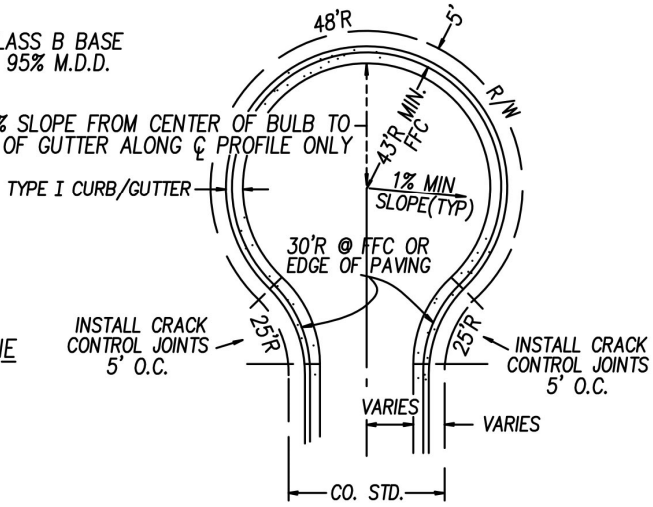
DRAWING NO: W–1.2

DATE: 2/93vp PAGE: 2



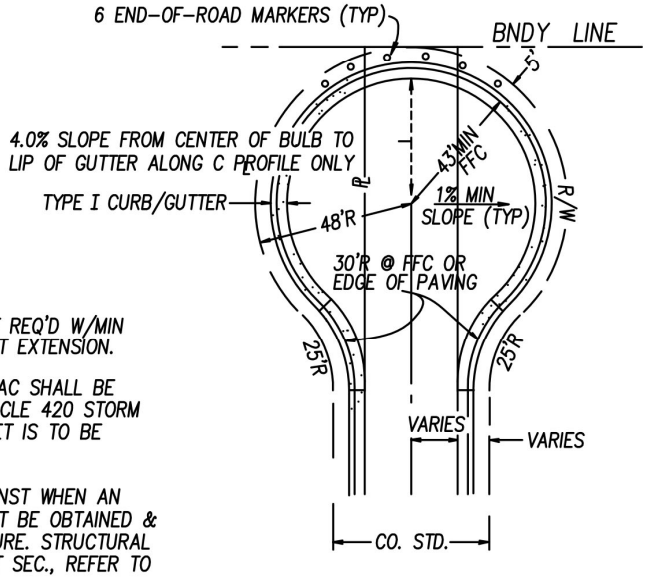
UNPAVED TEMPORARY

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

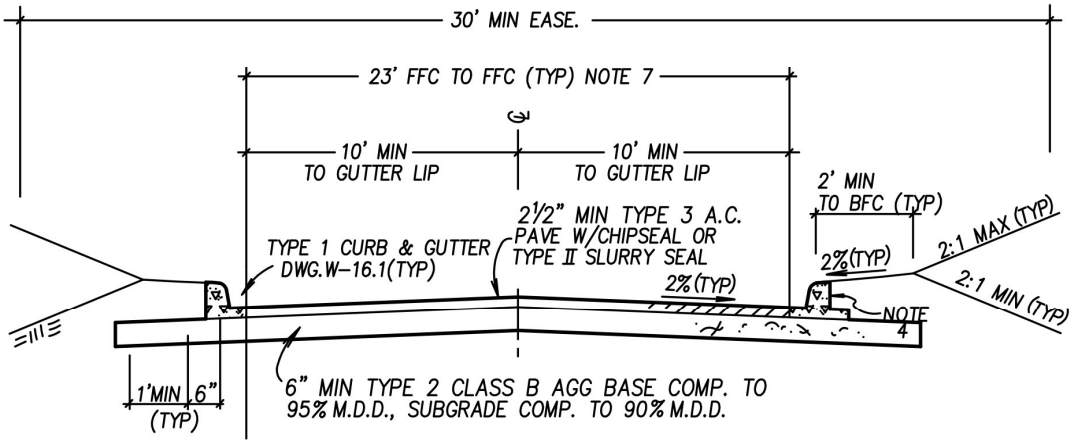
DRAWING NO: W-7

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

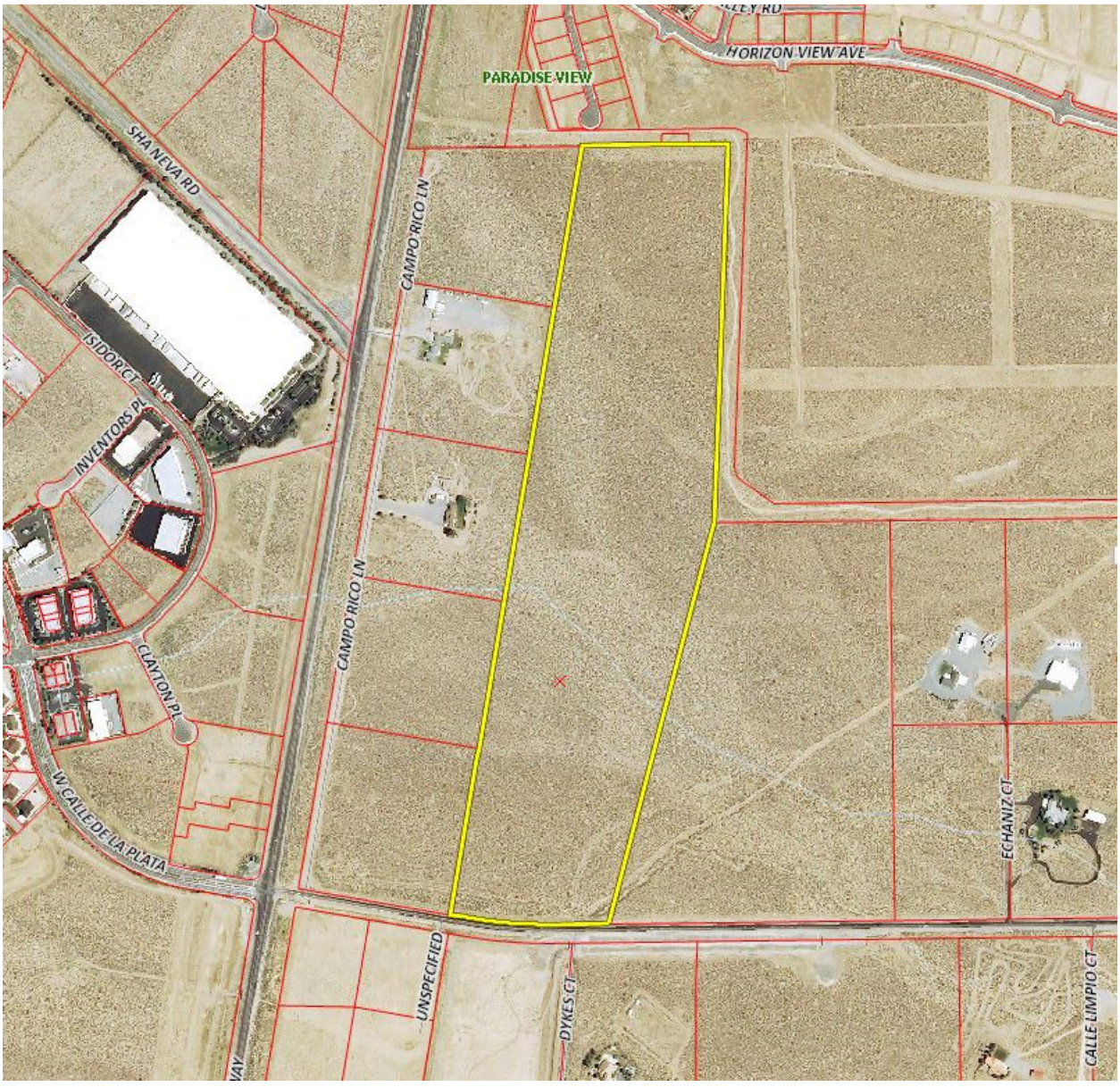


Exhibit II.C.2: Washoe County GIS – Topography in Vicinity of Site

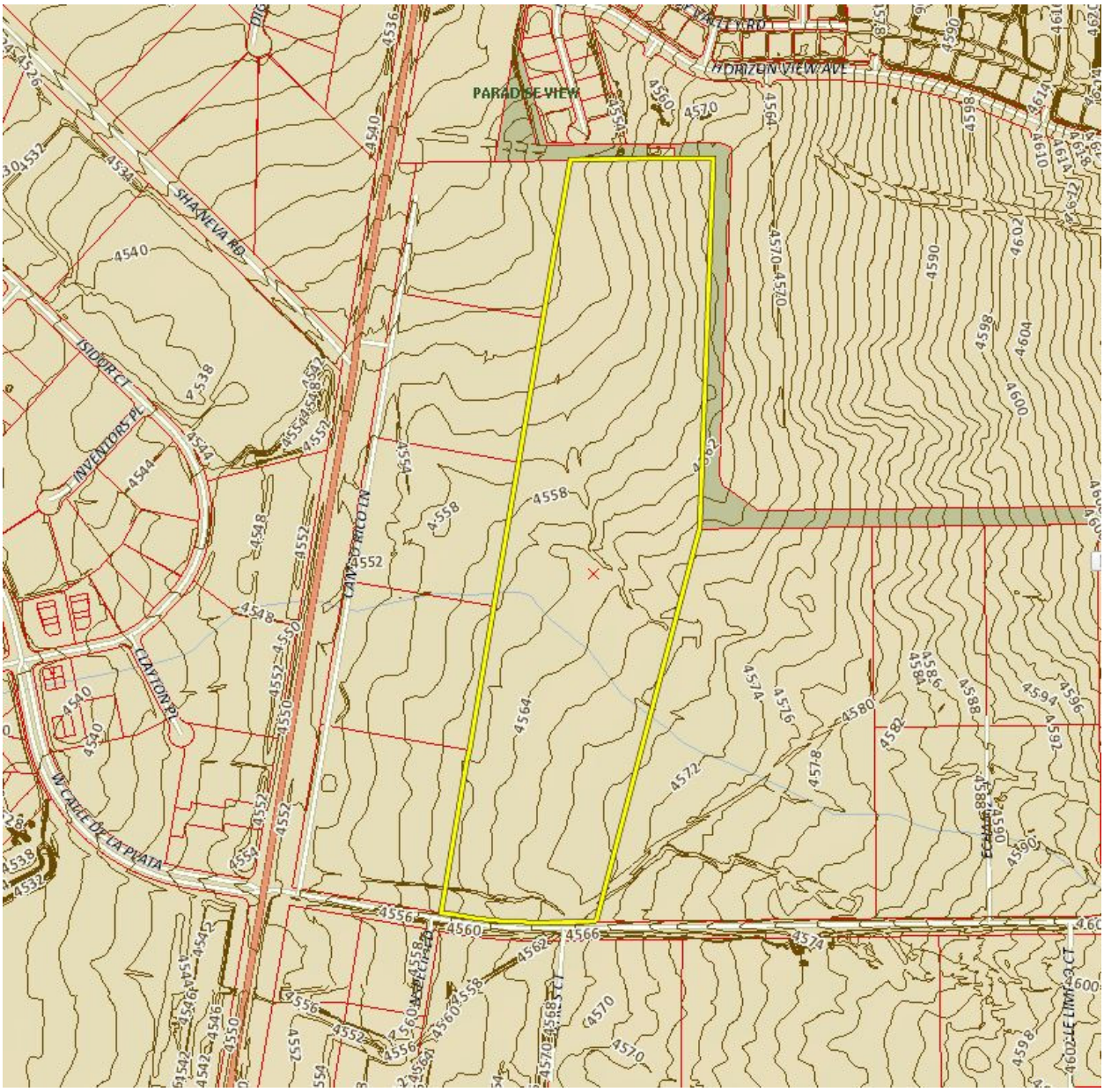


Exhibit II.C.3: Washoe County GIS – Master Plan Designation in Vicinity of Site

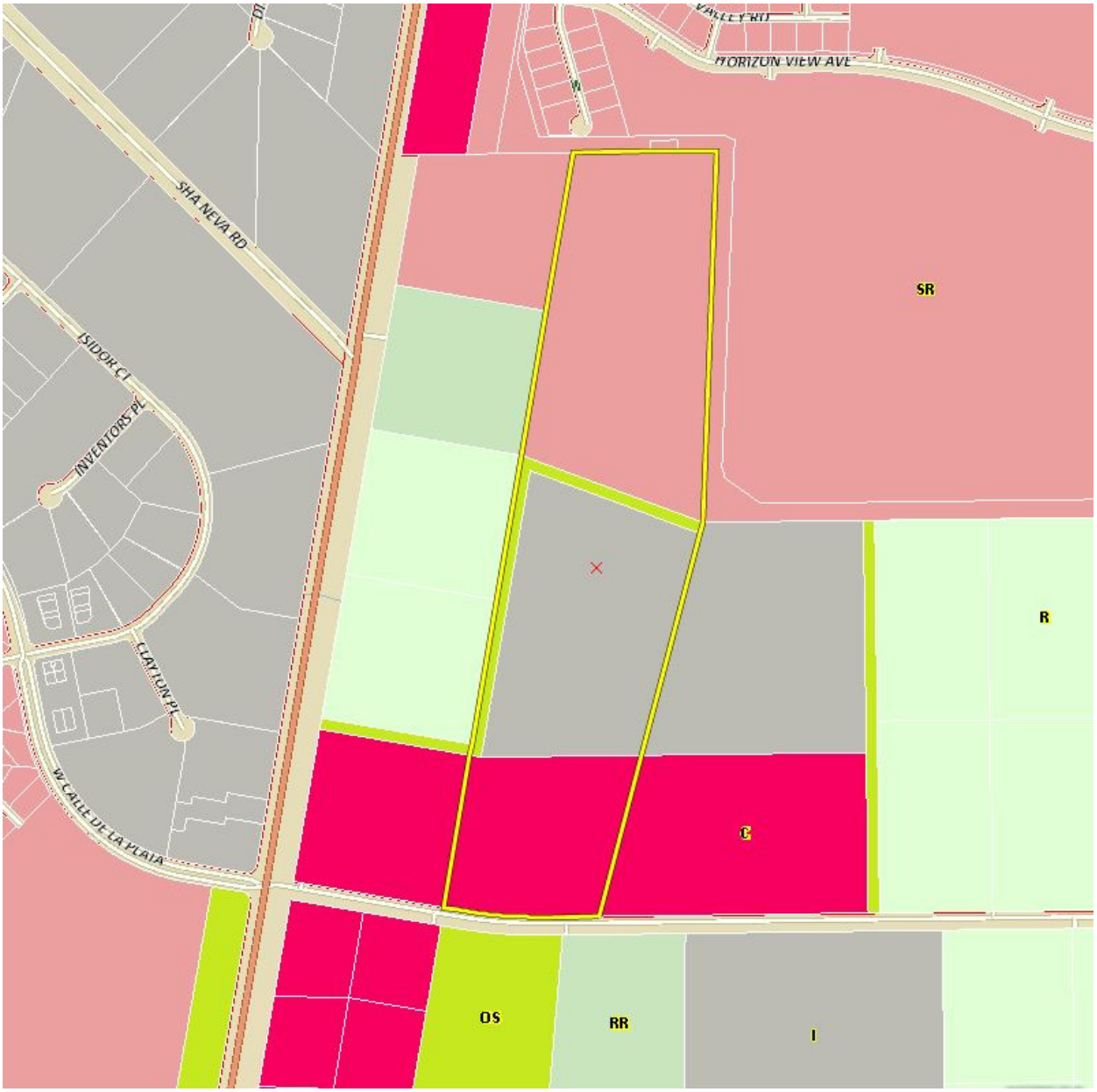
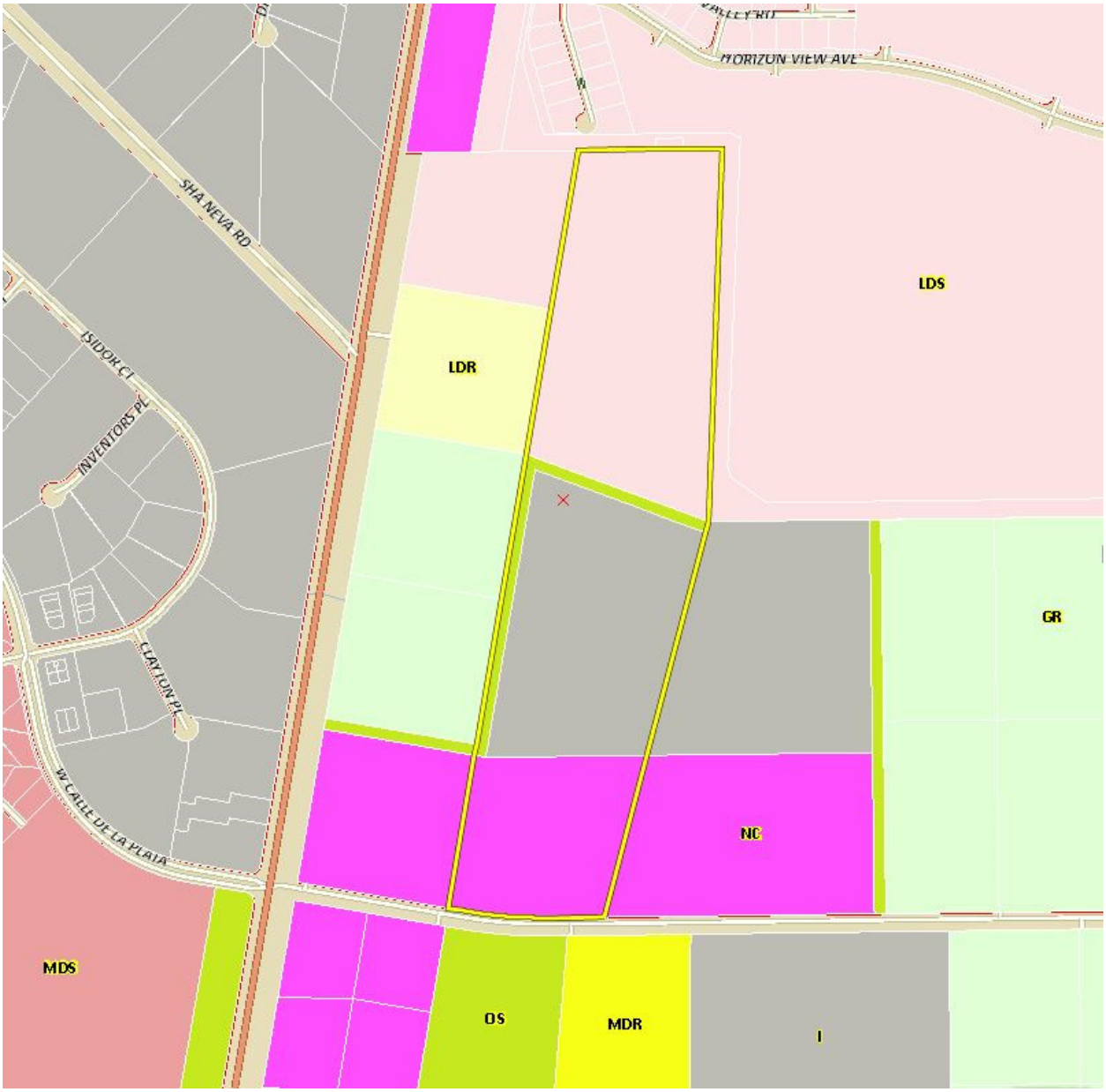


Exhibit II.C.4: Washoe County GIS – Existing Zoning in Vicinity of Site



Trip Estimate for Current Zoning:

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

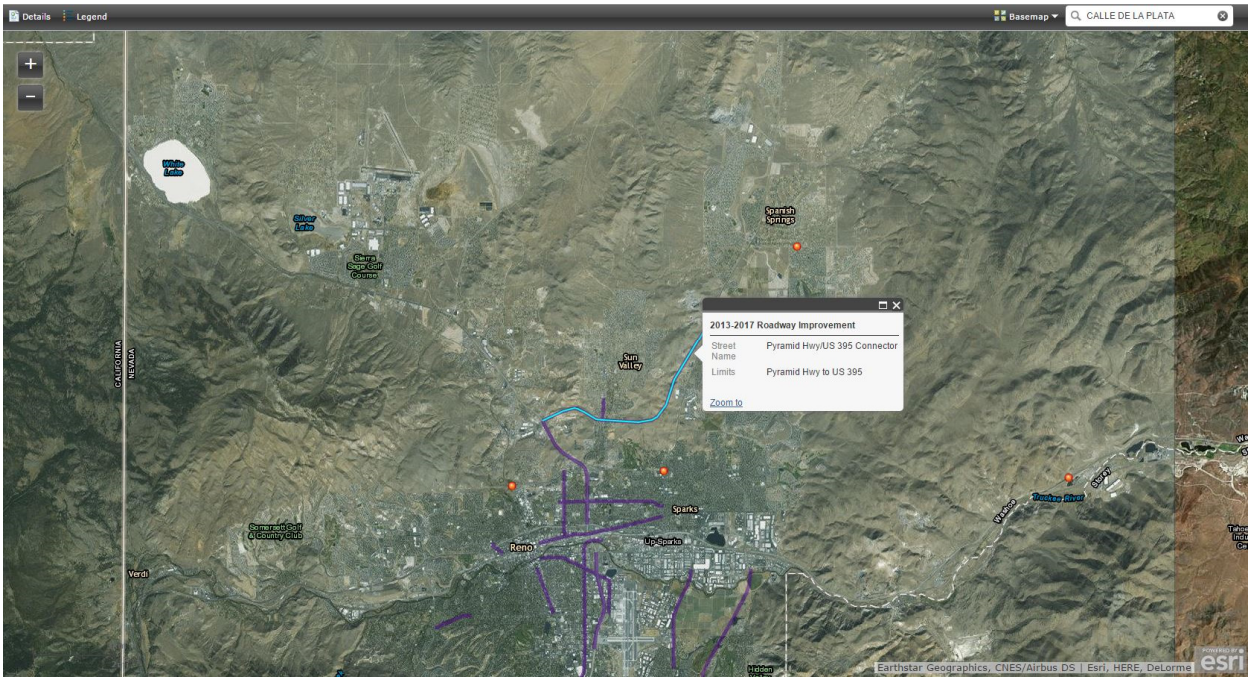
D. Existing and Proposed Roadways and Intersections

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.

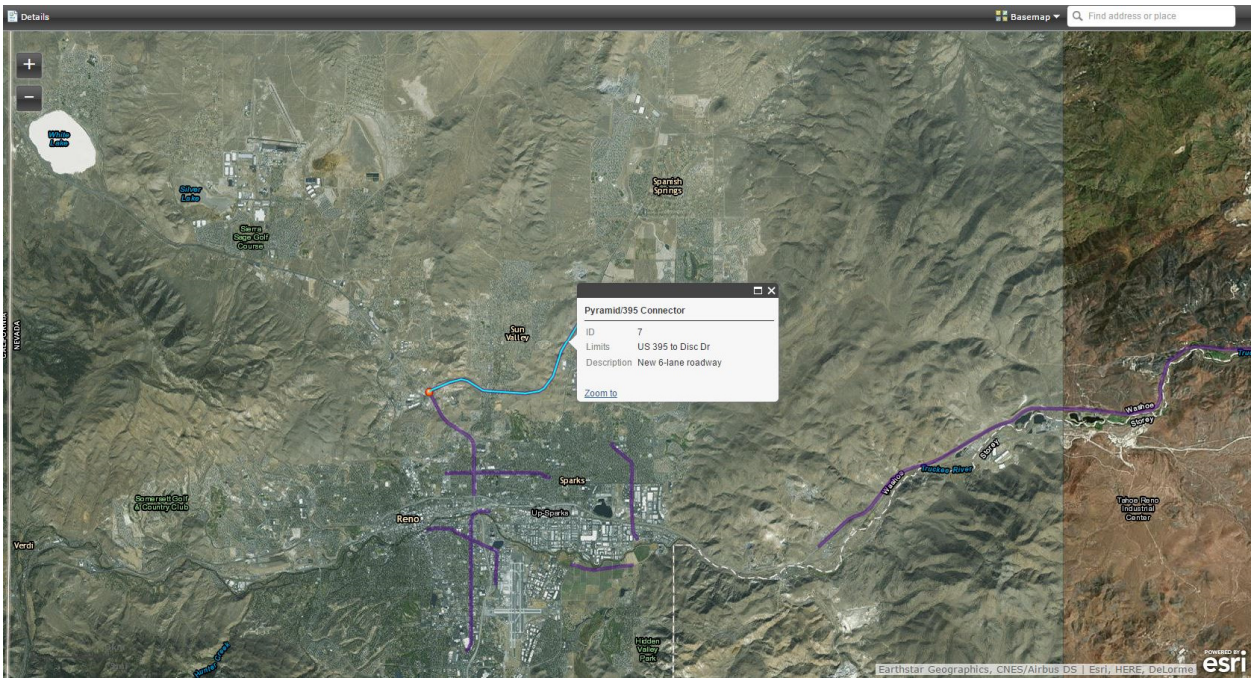
As shown in Exhibit II.D.1, the plans for Pyramid Highway for project years 2013-2017 are limited to south of US 395.

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



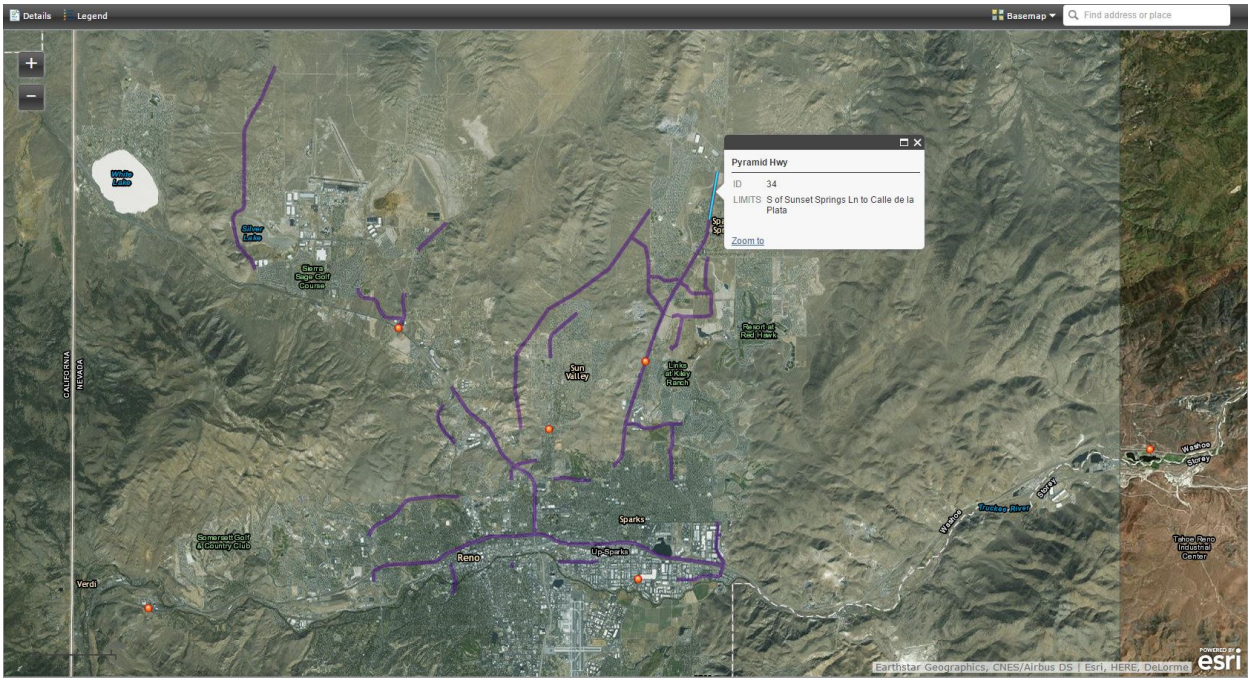
As shown in Exhibit II.D.2, the plans for Pyramid Highway for project years 2018-2022 are limited to south of US 395.

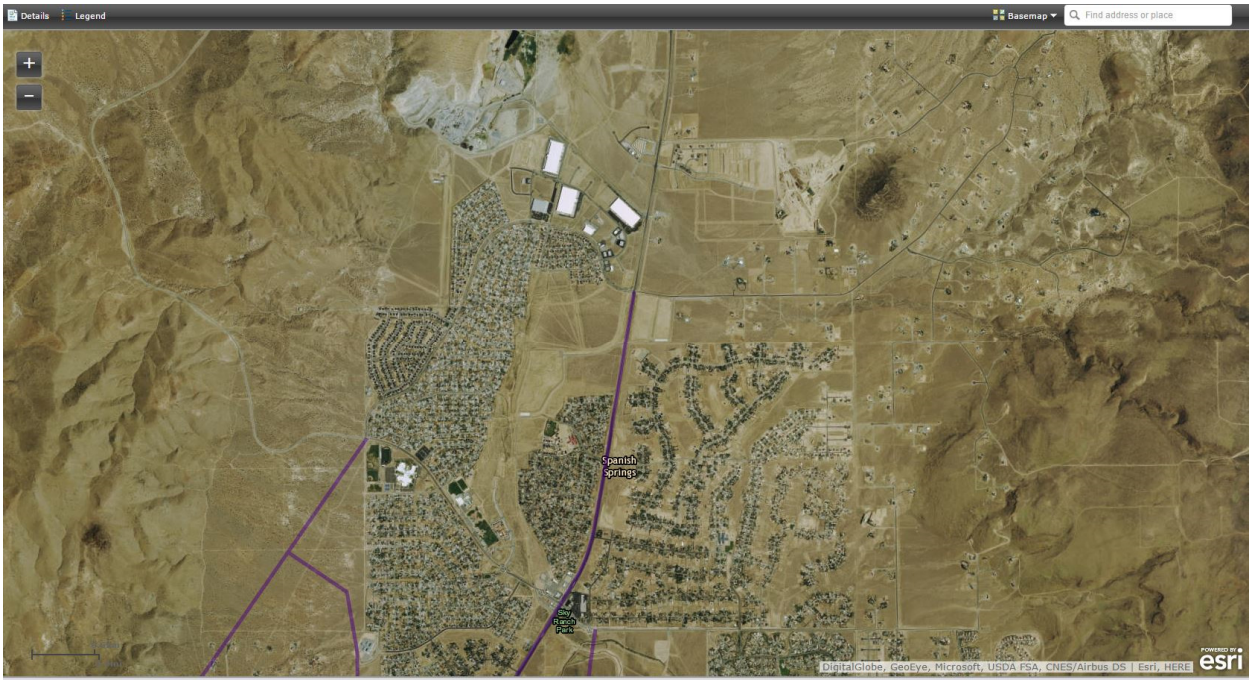
Exhibit II.D.2: Capital Improvement Project Plans 2018-2022



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.

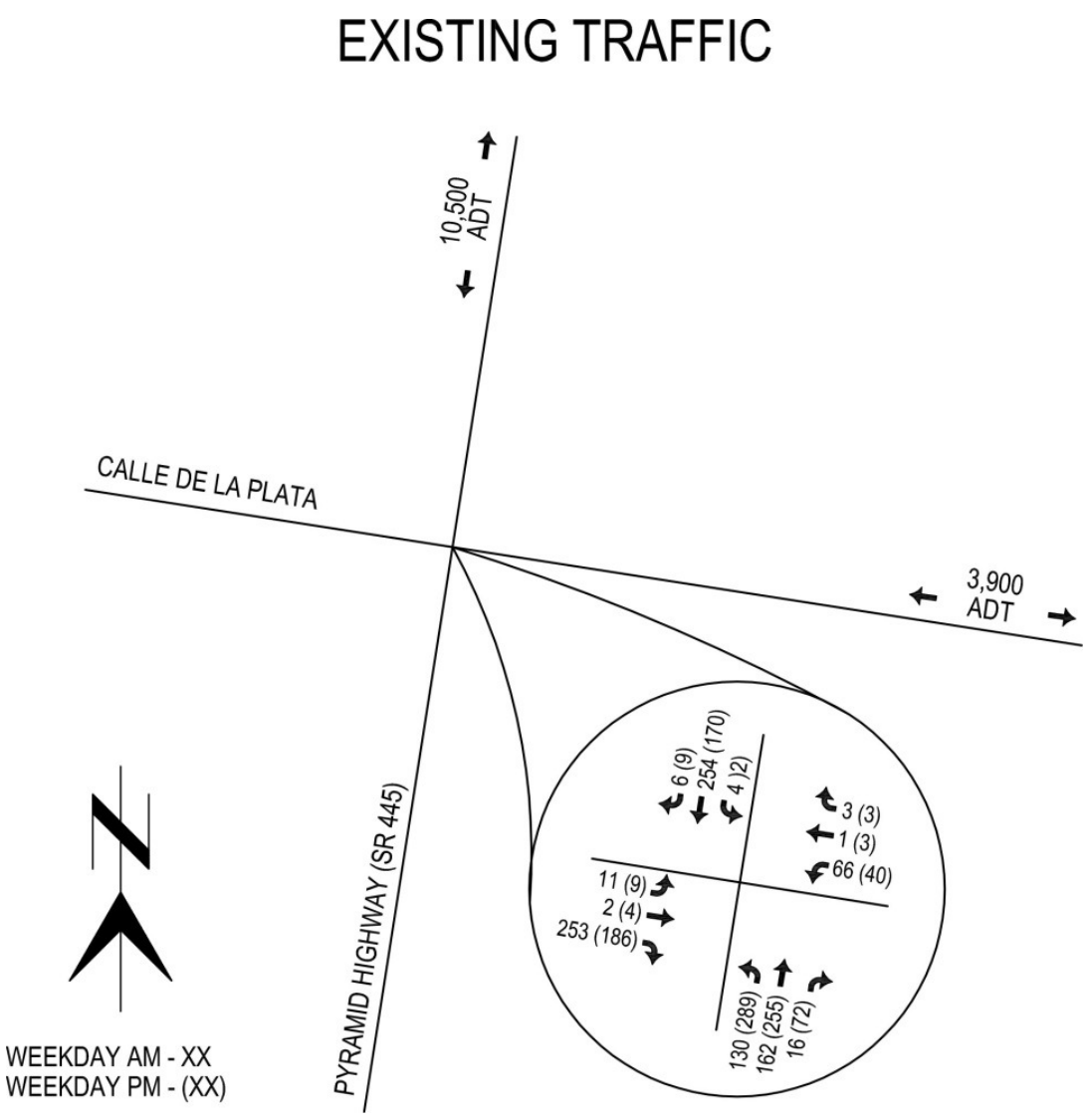
The Preliminary Site Layout is included in Appendix A of this report for reference. At the time of this report, the Map Amendment and Rezoning Application for this project is under review with Washoe County Community Development.

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	161	210	0.75	1.01

AM Peak Hour Trips:

161 units X 0.75 trips/unit = 121 AM Peak Hour trips
Distribution: Enter: 25% (30 trips)
Exit: 75% (91 trips)

PM Peak Hour Trips:

161 units X 1.01 trips/unit = 163 PM Peak Hour trips
Distribution: Enter: 64% (104 trips)
Exit: 36% (59 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	161	210	9.57	1,541

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

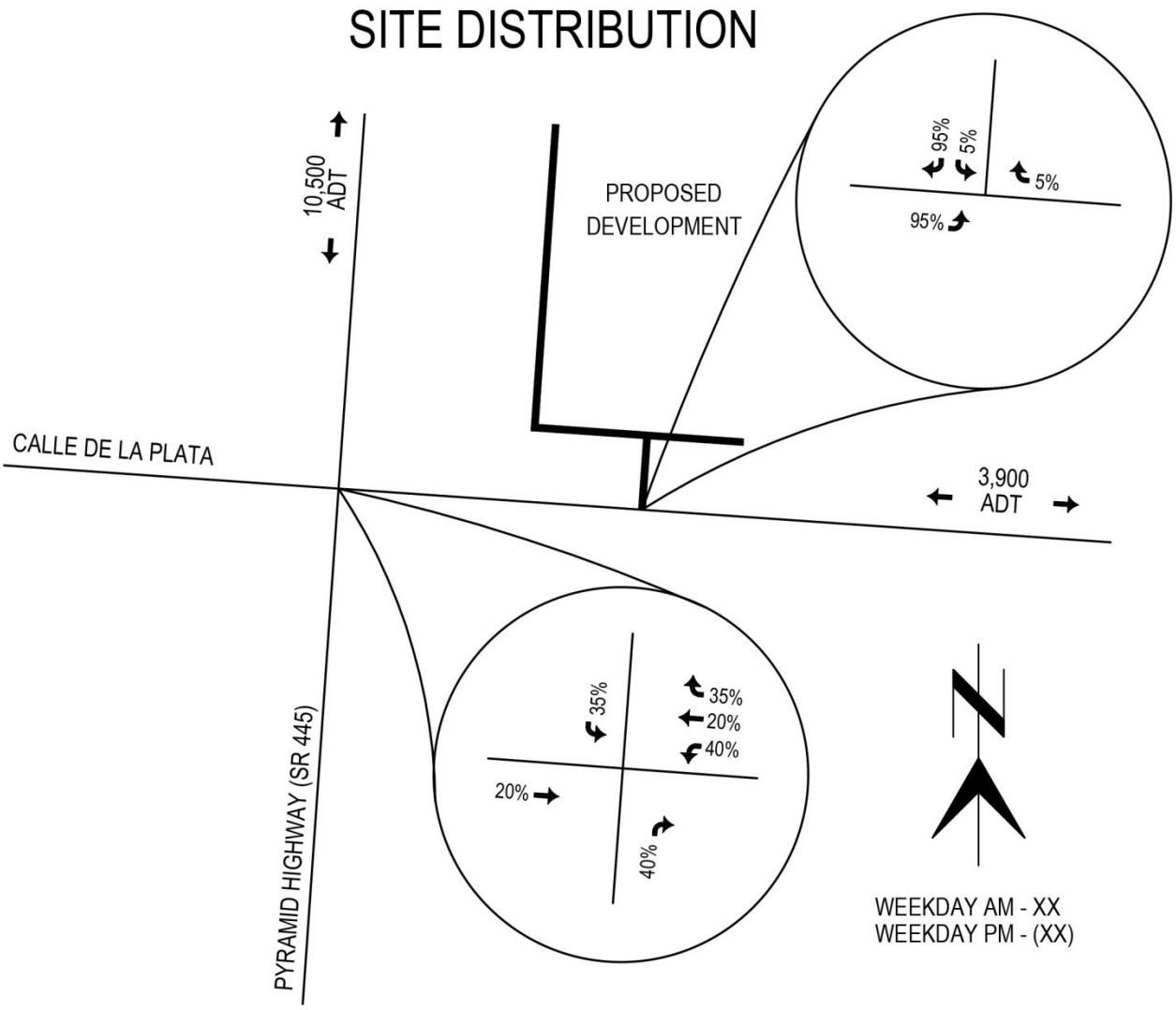
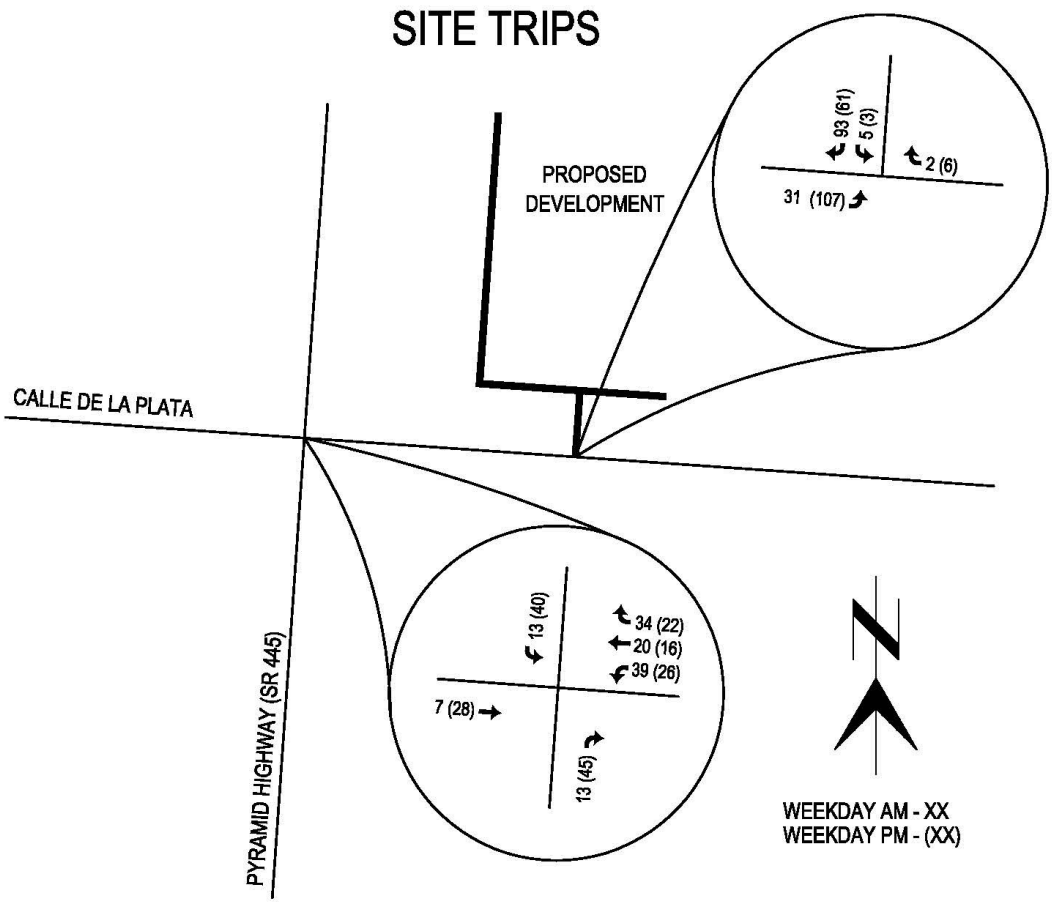


Exhibit V.2: Site Trips

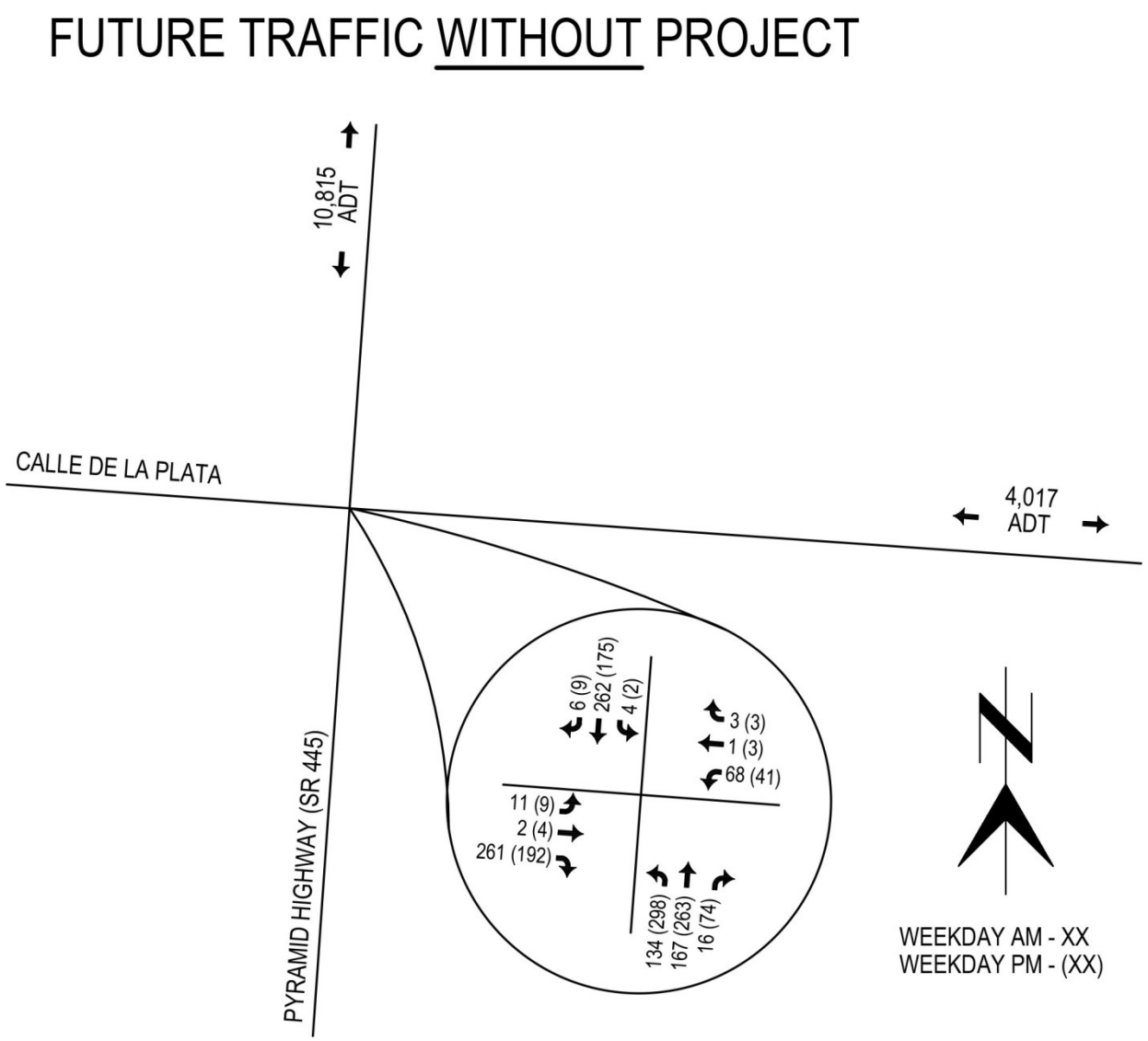


A. NON-SITE TRAFFIC FORECASTING

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.

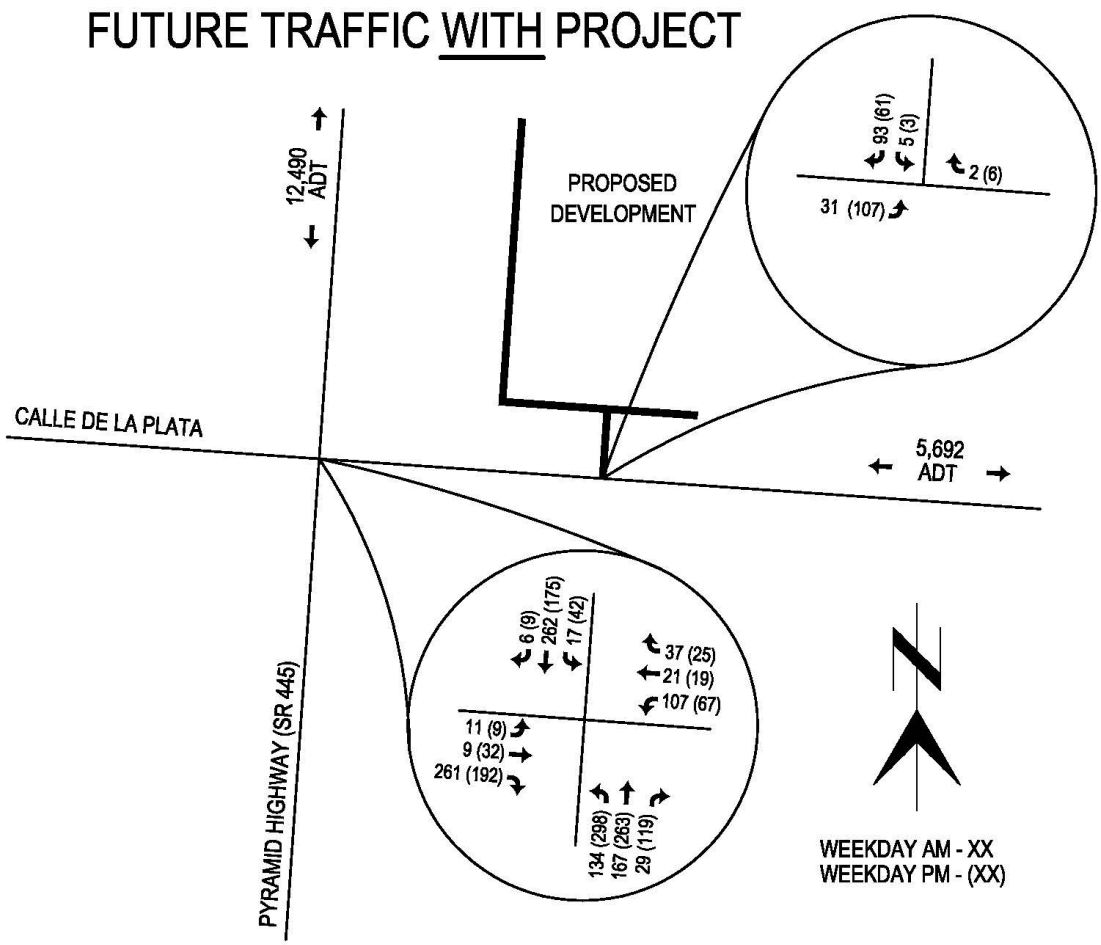
Exhibit V.A: Future Traffic Volumes WITHOUT the Project



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 • Rock Boulevard—Glendale Avenue to Victorian Avenue • South Virginia Street—Kietzke Lane to South McCarran Boulevard • Sun Valley Boulevard—2nd Avenue to 5th Avenue • 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

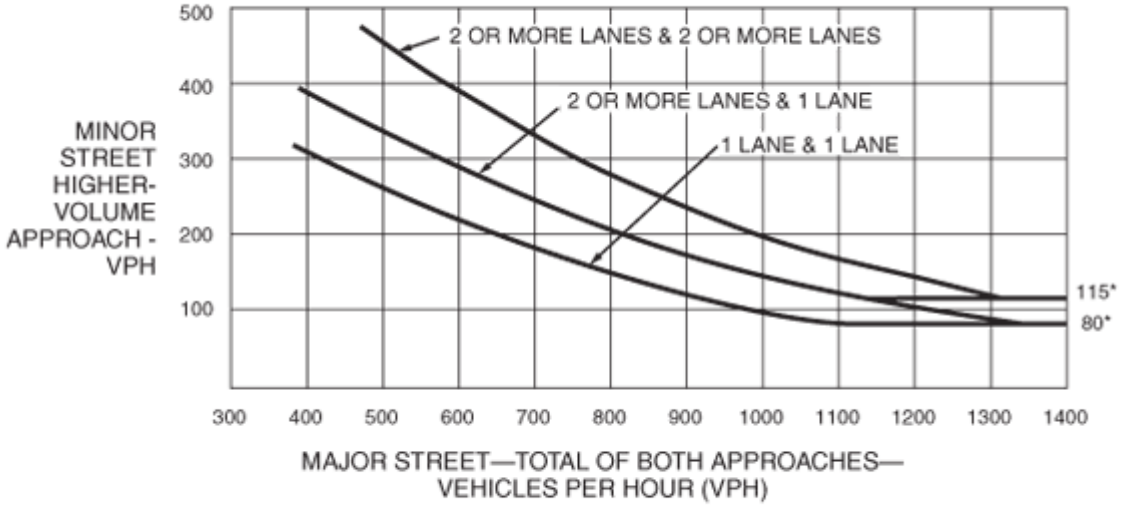
Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		**Vehicles per hour on major street (total of both approaches)**				**Vehicles per hour on higher-volume minor-street approach (one direction only)**			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	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

TENTATIVE MAP
FOR
BLACKSTONE ESTATES
LOTS 1-161
A SINGLE-FAMILY RESIDENTIAL SUBDIVISION
WASHOE COUNTY, NEVADA

LAND USE DATA

1. NUMBER OF LOTS: 161 LOTS
2. TOTAL AREA: 58.5 ACRES
3. COMMON AREA: 11.06 ACRES (481,759 SF)
   19% COMMON OPEN SPACE PROPOSED
   'A' (CENTRAL OPEN SPACE): 168,689 SF
   'B' (DRAINAGE/OPEN SPACE): 309,433 SF
   'C' (UTILITY/TRAIL CORRIDOR): 3,637 SF
4. DENSITY/INTENSITY: 3 DWELLING UNITS PER ACRE PERMITTED
   2.75 DWELLING UNITS PER ACRE PROPOSED
5. HEIGHT: 35' MAXIMUM PERMITTED/PROPOSED HEIGHT
6. LOT SIZE: 12,000 SF MINIMUM LOT SIZE PERMITTED (MDS ZONING) *
   80' MINIMUM LOT WIDTH PERMITTED (MDS ZONING) *
   * MINIMUM LOT SIZE MODIFIED FOR COMMON OPEN SPACE DEVELOPMENT
4. COMMON OPEN SPACE DEVELOPMENT: THE PROVISIONS OF SECTION 110.404.05, LOT STANDARDS, MAY BE MODIFIED PURSUANT TO ARTICLE 408, COMMON OPEN SPACE DEVELOPMENT. THIS MODIFICATION MAY INCLUDE THE REDUCTION IN MINIMUM LOT SIZES AS LONG AS THE OVERALL DENSITY IS NOT INCREASED BEYOND THAT PERMITTED IN THE REGULATORY ZONE.
5. AVERAGE LOT SIZE: 10,663 SF
6. LARGEST LOT: 24,759 SF (LOT 5)
7. SMALLEST LOT: 8,400 SF (LOT 20-22)
8. YARD/SETBACKS: FRONT YARD: 20'
   SIDE YARD: 8'
   REAR YARD: 20'
9. THERE SHALL BE NO FENCES OR OTHER OBSTRUCTIONS TO VISION MORE THAN 18" HIGHER THAN CURB LEVEL WITHIN THE SITE VISIBILITY TRIANGLES.
10. ARCHITECTURAL FEATURES: CORNICES, CANOPIES, CHIMNEYS, EAVES OR OTHER SIMILAR ARCHITECTURAL FEATURES MAY EXTEND INTO A REQUIRED SETBACK BY A DISTANCE NOT TO EXCEED TWO (2) FEET.
11. DETACHED GARAGES MAY BE LOCATED BEHIND THE REQUIRED FRONT SETBACK.
12. DECKS WHICH ARE LESS THAN 18" IN HEIGHT FROM THE FINISHED GRADE ARE NOT COUNTED AS A STRUCTURE FOR SETBACK PURPOSES.
13. OFF-STREET PARKING: 2 SPACES REQUIRED PER DWELLING UNIT, 1 OF WHICH MUST BE IN AN ENCLOSED GARAGE
    4 SPACES PROVIDED PER DWELLING UNIT, 2 OF WHICH IN A GARAGE AND 2 OF WHICH IN THE DRIVEWAY
14. OPEN SPACE: PRIVATE OPEN SPACE PROPOSED PER SECTION 110.432.10 OF THE WASHOE COUNTY DEVELOPMENT CODE AND COMMON OPEN SPACE PROPOSED PER SECTION 110.432.15 OF THE CODE
    REQUIRED: 400 SF PRIVATE SPACE PER LOT
    200 SF COMMON OPEN SPACE PER LOT (32,200 SF)
    PROPOSED: 1,400 SF MINIMUM PRIVATE SPACE PER LOT
    194,115 SF (4.45 AC) COMMON OPEN SPACE (COMMON AREA 'A')

GENERAL NOTES

1. PARCEL NUMBER: 534-571-01
2. PROJECT ADDRESS: 350 CALLE DE LA PLATA
3. LOCATED WITHIN THE SPANISH SPRINGS PLANNED AREA OF WASHOE COUNTY
4. EXISTING ZONING IS NEIGHBORHOOD COMMERCIAL/OFFICE (NC), INDUSTRIAL (I) AND SUBURBAN
   PROPOSED ZONING IS MDS WITH CLUSTER OPEN SPACE OPTION
5. NO BUILDINGS EXIST ON THE SUBJECT PROPERTY.
6. NO SEPTIC SYSTEMS, WELLS, LEACH FIELDS OR OVERHEAD UTILITIES EXIST OR ARE PROPOSED ON THE SUBJECT PROPERTY.
7. PROMINENT LANDMARKS, AREAS OF UNIQUE NATURAL BEAUTY, ROCK OUTCROPPINGS, VISTAS AND NATURAL FOLIAGE ARE NOT PRESENT ON THE SUBJECT PROPERTY.
8. CUTS AND FILLS OF GREATER THAN 5' IN HEIGHT ARE NOT PROPOSED FOR THE SUBJECT PROPERTY.
9. NO WETLANDS OR SPRINGS ARE KNOWN TO EXIST ON THE SUBJECT PROPERTY.
10. SECONDARY EMERGENCY ACCESS IS PROPOSED THROUGH THE ADJACENT SUBDIVISION TO THE EAST. IN THE EVENT THIS ACCESS IS NOT AVAILABLE AT THE TIME OF DEVELOPMENT, EMERGENCY ACCESS WILL BE PROVIDED THROUGH LOT 5 IN ACCORDANCE WITH WASHOE COUNTY STANDARD DETAIL W-1.5.
11. LANDSCAPING REQUIRED PER SECTION 110.412 OF THE WASHOE COUNTY DEVELOPMENT CODE.
12. LIGHTING SHALL BE IN CONFORMANCE WITH SECTION 110.414 OF THE WASHOE COUNTY DEVELOPMENT CODE. SPECIFICALLY, PER SECTION 110.414.21, COVERS MUST BE INSTALLED ON ALL LIGHTING FIXTURES AND LAMPS MUST NOT EXTEND BELOW THE BOTTOM OF THE COVER.
13. THE DESIGN AND POSTED SPEED FOR THIS SUBDIVISION IS 25 MPH.
14. ALL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM WITH THE MOST RECENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION AND WASHOE COUNTY STANDARDS.
15. THE MINIMUM PAVEMENT STRUCTURAL SECTION SHALL BE TWO AND ONE-HALF (2.5) INCHES OF TYPE 2 OR TYPE 3 ASPHALT CONCRETE PAVEMENT COMPACTED TO NINETY-FIVE (95) PERCENT MINIMUM DENSITY OVER AN ENGINEERED SUBGRADE. DRAINAGE SHALL BE CONSISTENT WITH COUNTY STANDARDS, INCLUDING ARTICLE 420, STORM DRAINAGE STANDARDS. THE PAVEMENT SHALL BE SEALED IN ACCORDANCE WITH WASHOE COUNTY STANDARDS.

BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS PLAT IS BASED ON THE NEVADA COORDINATE SYSTEM OF 1983, WEST ZONE, NAD 86/94. DISTANCES SHOWN ARE GROUND DISTANCES USING A PROJECT COMBINED GRID TO GROUND SCALE FACTOR OF 1.0001998699

BASIS OF ELEVATIONS: DATUM: NAVD 88
PROJECT BENCHMARK: LUMOS CONTROL POINT 500 HAVING AN ELEVATION OF 4550.27'

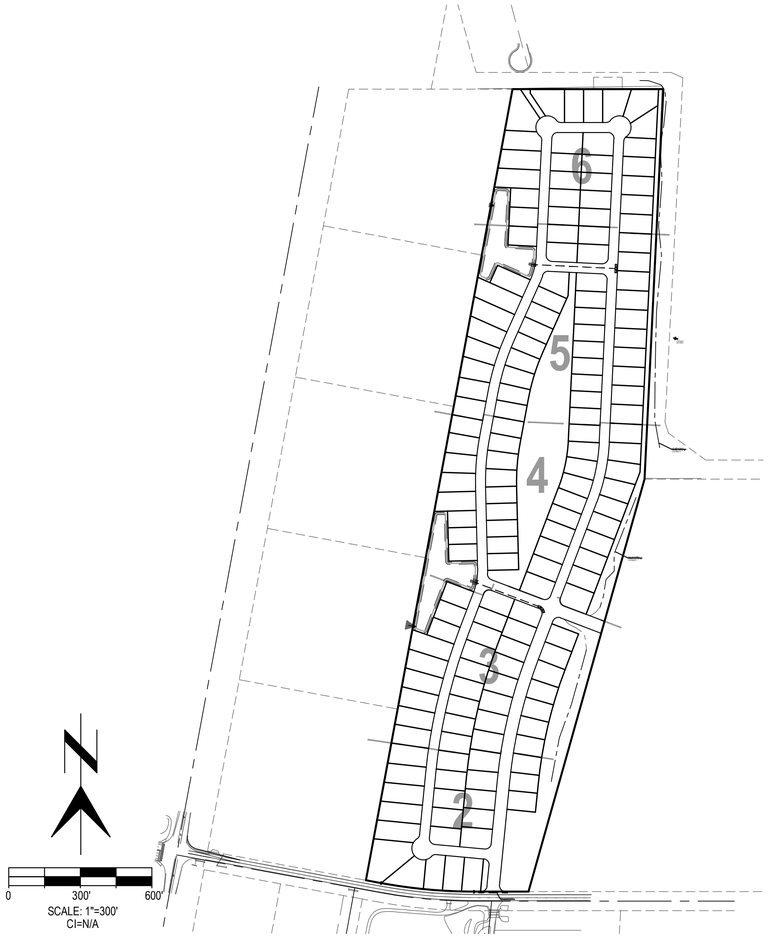
TOPOGRAPHY DERIVED FROM AERIAL PHOTOGRAMMETRY, DATE OF FLIGHT 07/23/2015

PRELIMINARY GRADING NOTES

1. ESTIMATED CUT: XXX CY
   ESTIMATED FILL: XXX CY
2. AREA OF DISTURBANCE: 100%
3. NO MATERIAL IS TO BE REMOVED FROM THE SITE.
4. BEST MANAGEMENT PRACTICES:
   - 4.1. IF A DISTURBED AREA IS LEFT UNDEVELOPED FOR OVER THIRTY DAYS, THE AREA IS TO BE TREATED TO PREVENT EROSION. THE TREATMENT MAY INCLUDE RE-VEGETATION, INSTALLATION OF STRAW MATTING AND/OR RE-SEEDING WITH COMPOSTED MULCH. SURFACE APPLICATION OF WATER, BOTH TO PREVENT WIND-BLOWN EROSION AND PROMOTE GROWTH OF VEGETATION, IS REQUIRED UNTIL VEGETATION IS FULLY ESTABLISHED AND THE SITE IS STABILIZED.
   - 4.2. WADDLES WILL BE INSTALLED ACROSS ALL STORM DRAIN INLETS, DEPRESSED CURB INLETS, CULVERT INLETS AND LOW-FLOW OUTLET PIPES TO PREVENT TRANSPORT OF SITE-GENERATED SEDIMENT.
   - 4.3. STRAW BALES WILL BE PLACED ACROSS THE DOWNSTREAM END OF ALL GRADED CHANNELS AND DITCHES TO PREVENT TRANSPORT OF SEDIMENT. IN ADDITION, STRAW BALES WILL BE INSTALLED ACROSS THE DOWNSTREAM END OF THE DETENTION BASIN OUTLET WEIRS AND LOW-FLOW OUTLET PIPES.
   - 4.4. CONTINUOUS SILT FENCING WILL BE INSTALLED ALONG THE ENTIRE SITE PERIMETER.
   - 4.5. APPLICATION OF WATER TO PREVENT WIND-BLOWN SEDIMENT TRANSPORT WILL BE REQUIRED FOR ALL EXPOSED SURFACES THROUGHOUT THE DURATION OF CONSTRUCTION.

SANITARY SEWER NOTES

1. MAXIMUM MANHOLE SPACING IS 400 FEET.
2. MINIMUM PIPE RADIUS IS 400 FEET - HORIZONTAL LAYOUT AS SHOWN ON PLAN.
3. THE INVERT GRADE AT THE EXIT OF EACH MANHOLE IS 0.1 FOOT BELOW THE INVERT GRADE OF THE ENTRANCE PIPE.
4. ALL MANHOLES SHALL BE A CONE TYPE 1-A AS SHOWN IN DWR STANDARD DETAIL NO. WR-1.3 :TYPE 1-A MANHOLE" WITH THE VERTICAL WALL ON THE INFLOW SIDE.
5. WATERTIGHT, BOLTED MANHOLE COVERS SHALL BE USED ON MANHOLES LOCATED IN AREAS SUBJECT TO FLOODING.



SITE PLAN

SCALE: 1"=300'

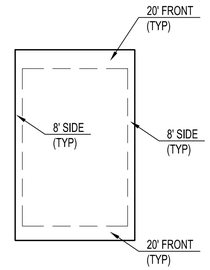
THIS PROJECT:

VICINITY MAP

SITUATED IN SECTION 23
TOWNSHIP 21 NORTH, RANGE 20 EAST
WASHOE COUNTY, NEVADA

LEGEND

- BOUNDARY LINE
- LOT / COMMON AREA LINES
- EASEMENT LINE
- BUILDING SETBACK LINE
- ADJACENT PARCEL LINES
- ★ DRIVEWAY RESTRICTED TO THIS SIDE OF LOT



TYPICAL LOT DETAIL

N.T.S.

SHEET INDEX

DEVELOPER

BLACKSTONE DEVELOPMENT GROUP
ATTN: JOSHUA MYERS
333 N. WILMOT ROAD, SUITE 340
TUCSON, AZ 85711
TELEPHONE: (520) 618-5378
FAX: (520) 529-1752

OWNER

XXXX
ATTN: XXX
XXX
XXX
TELEPHONE: (775) XXX-XXXX
FAX: (775) XXX-XXXX

ENGINEER'S STATEMENT

THIS TENTATIVE MAP IS IN COMPIANCE WITH ALL APPLICABLE PROVISIONS OF THE WASHOE COUNTY DEVELOPMENT CODE.

Two working days before you dig
CALL FOR THE BLUE STAKES
800-227-2600
USANORTH811.ORG

NO.	DATE	REVISION	BY	CHKD.	APPR.

C:\Users\Erin\Desktop\Scan.jpg

TENTATIVE MAP
BLACKSTONE ESTATES
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
LOTS 1-161 AND COMMON AREAS 'A' - 'C'

PARCEL 23-1-0-1 OF SPANISH SPRING RANCHES, NO 2 AS RECORDED IN LAND DIVISION MAP NO 23
AND RECORD OF SURVEY NO 1098, WASHOE COUNTY, NEVADA

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

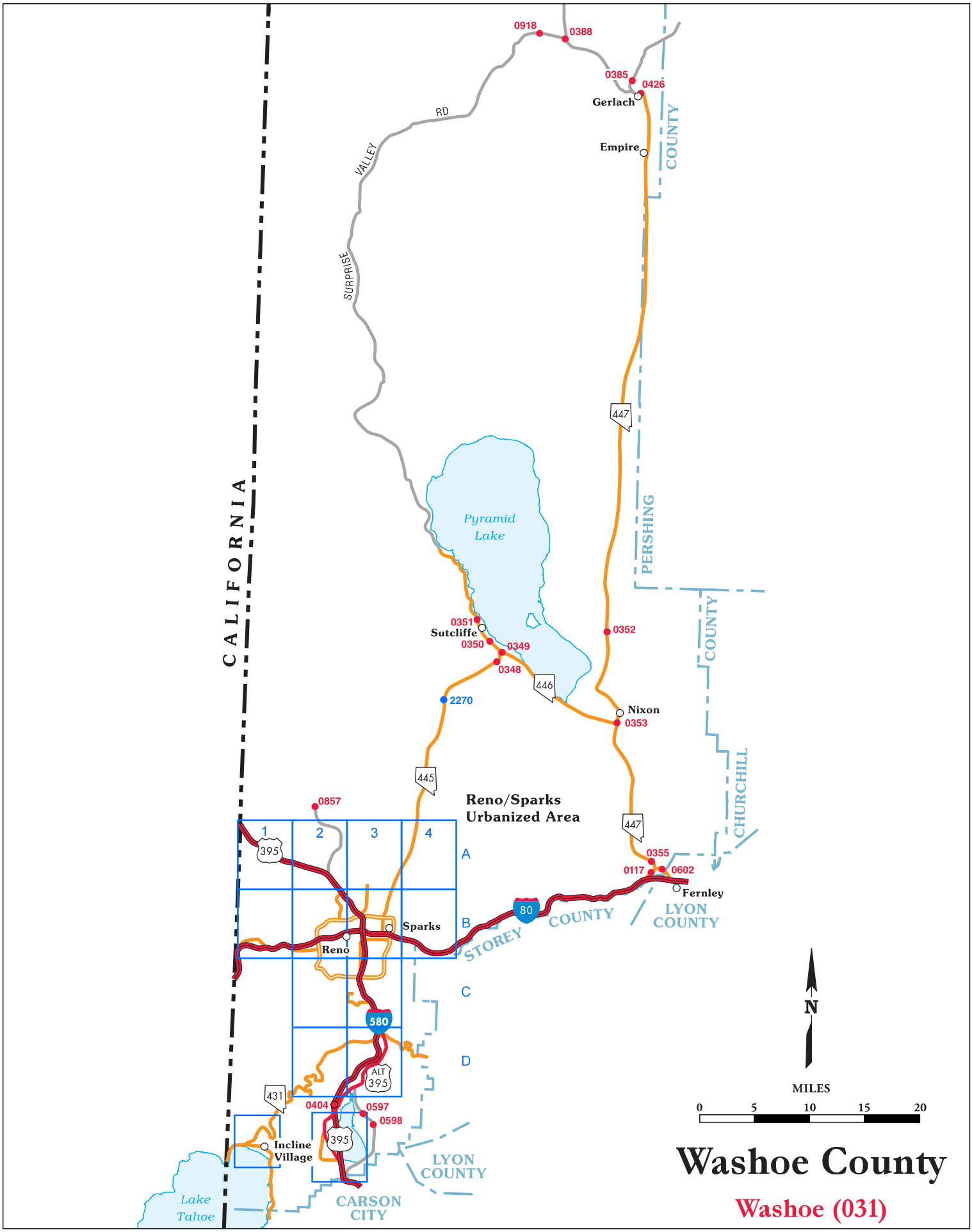
DRWN. BY	EEH
DSGN. BY	EEH
CHKD. BY	GWH
CASE NO.	
SHEET NO.	1 OF 9

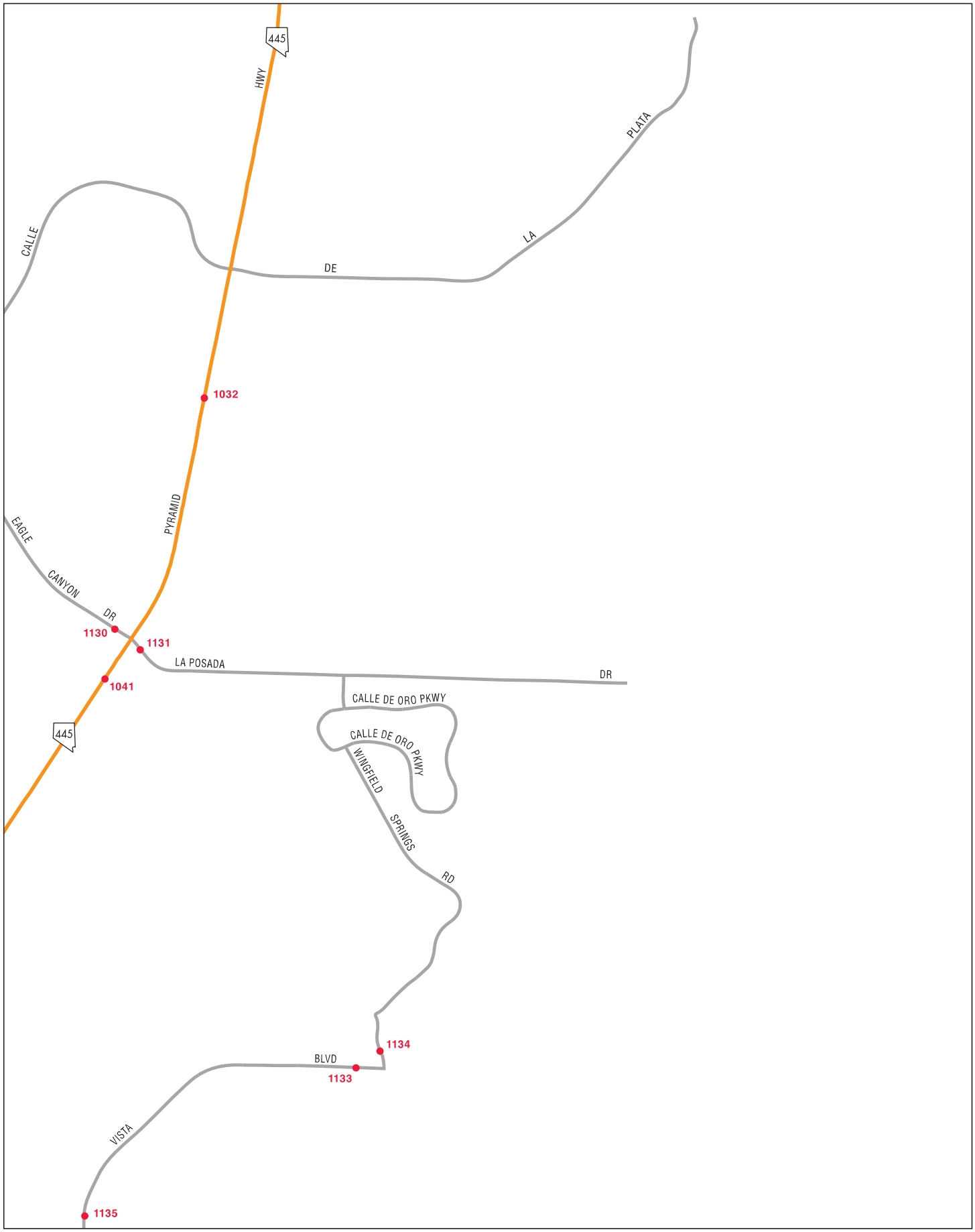
APPENDIX B:

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
CALIFORNIA
447
Pyramid
Lake
PERSHING
COUNTY
0351
Sutcliffe
0350
0349
0348
0352
446
2270
Nixon
0353
445
0857
Reno/Sparks
Urbanized Area
1
2
3
4
A
B
C
D
395
447
0355
0117
0602
CHURCHILL
Fernley
80
Sparks
Reno
STOREY
COUNTY
LYON
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

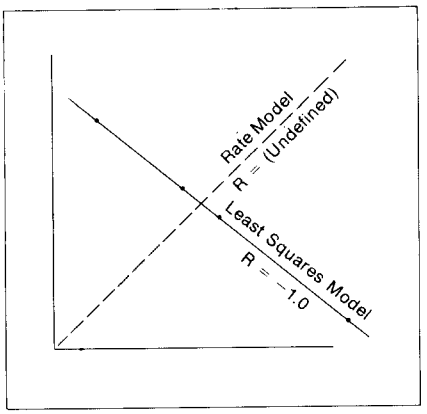


Figure 1.

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

Code	Description	Unit of Measure	Trips Per Unit
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)

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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.

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Single-Family Detached Housing
(210)

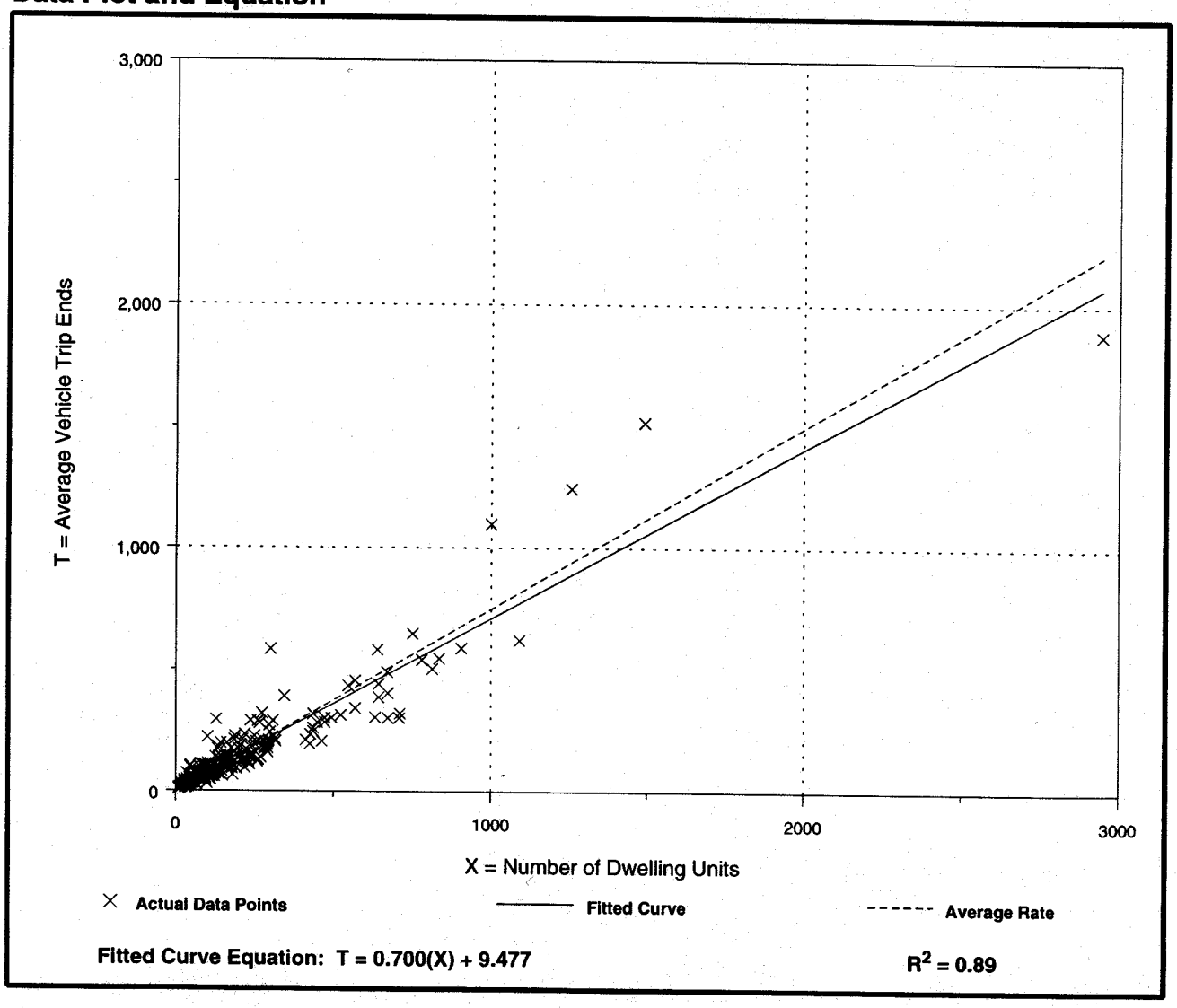
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

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)

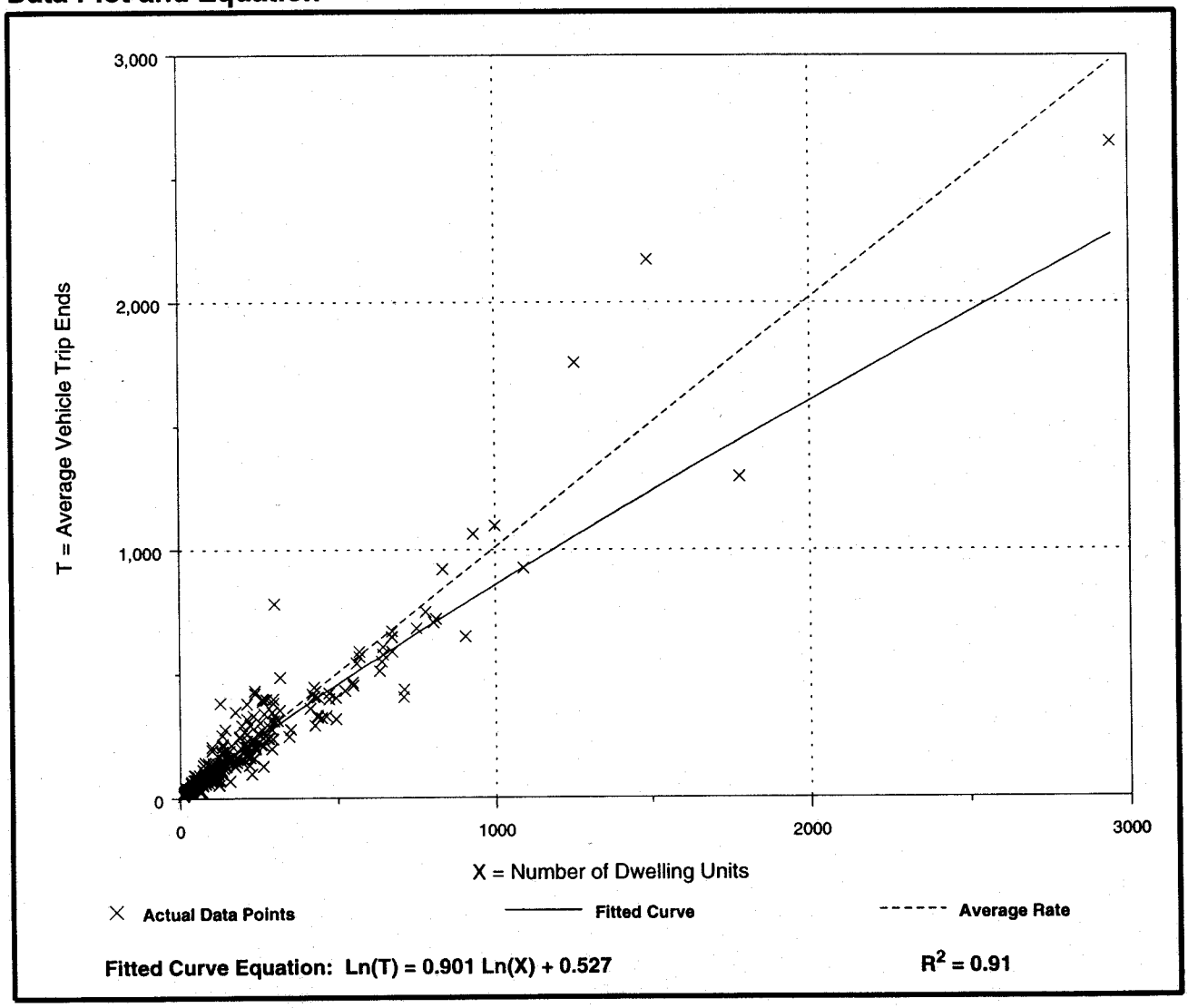
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

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)

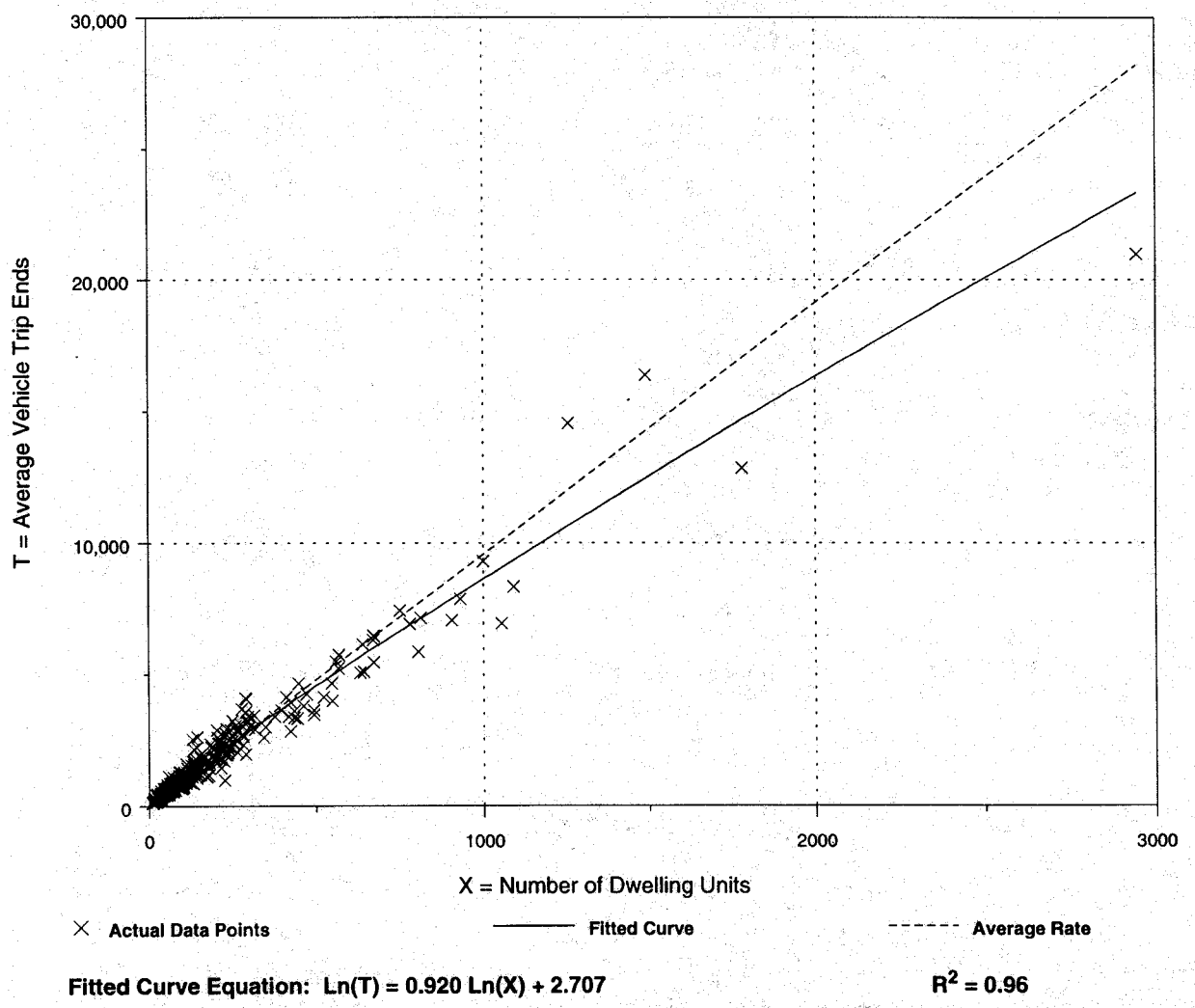
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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

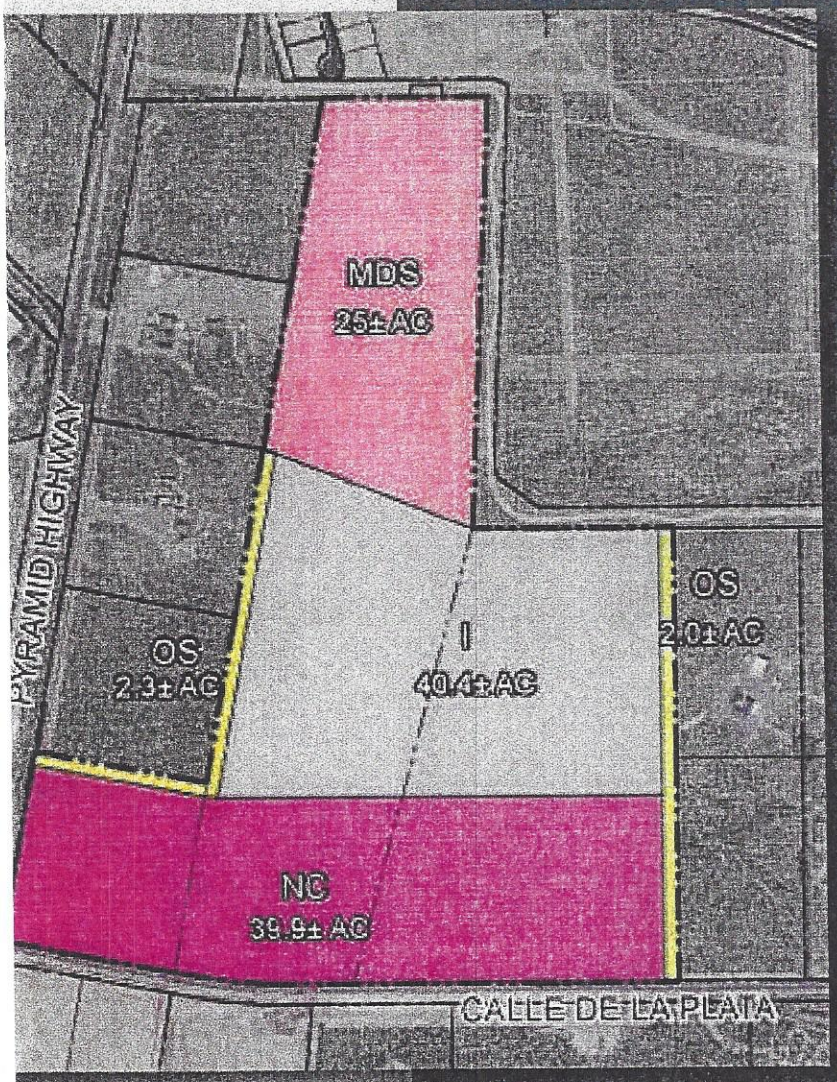
APPENDIX F:

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:

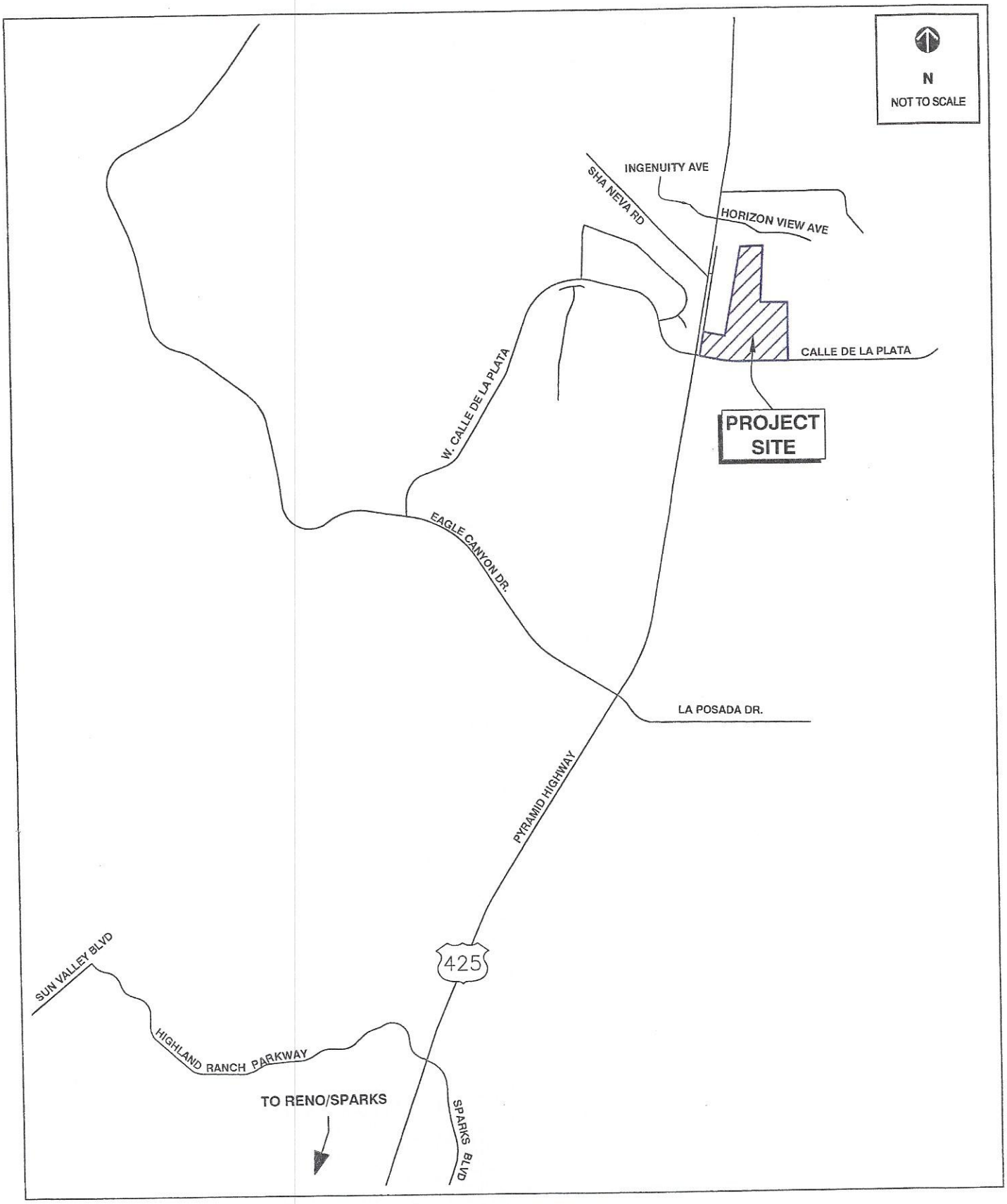
- Village Green Commercial Center (southeast corner of Pyramid Highway/Calle de la Plata intersection)
- Campo Rico Business Center (north of Calle de la Plata along Pyramid Highway)
- Calle de la Plata Retail Project (northwest corner of Pyramid Highway/Calle de la Plata intersection)

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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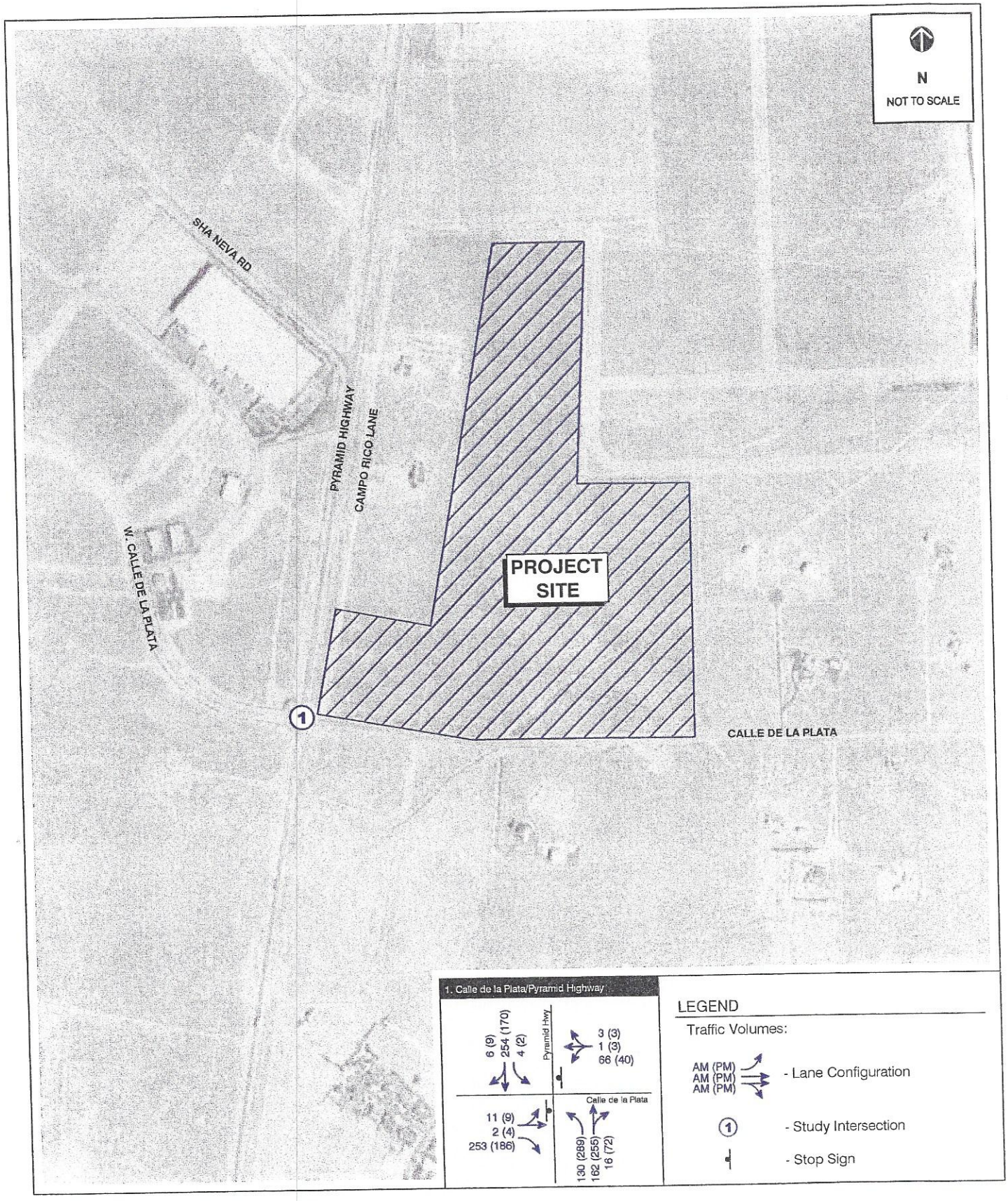
Village at the Peak
Traffic Impact Study
Project Location

Figure 1



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Village at the Peak
Traffic Impact Study
Existing Conditions

Figure 2

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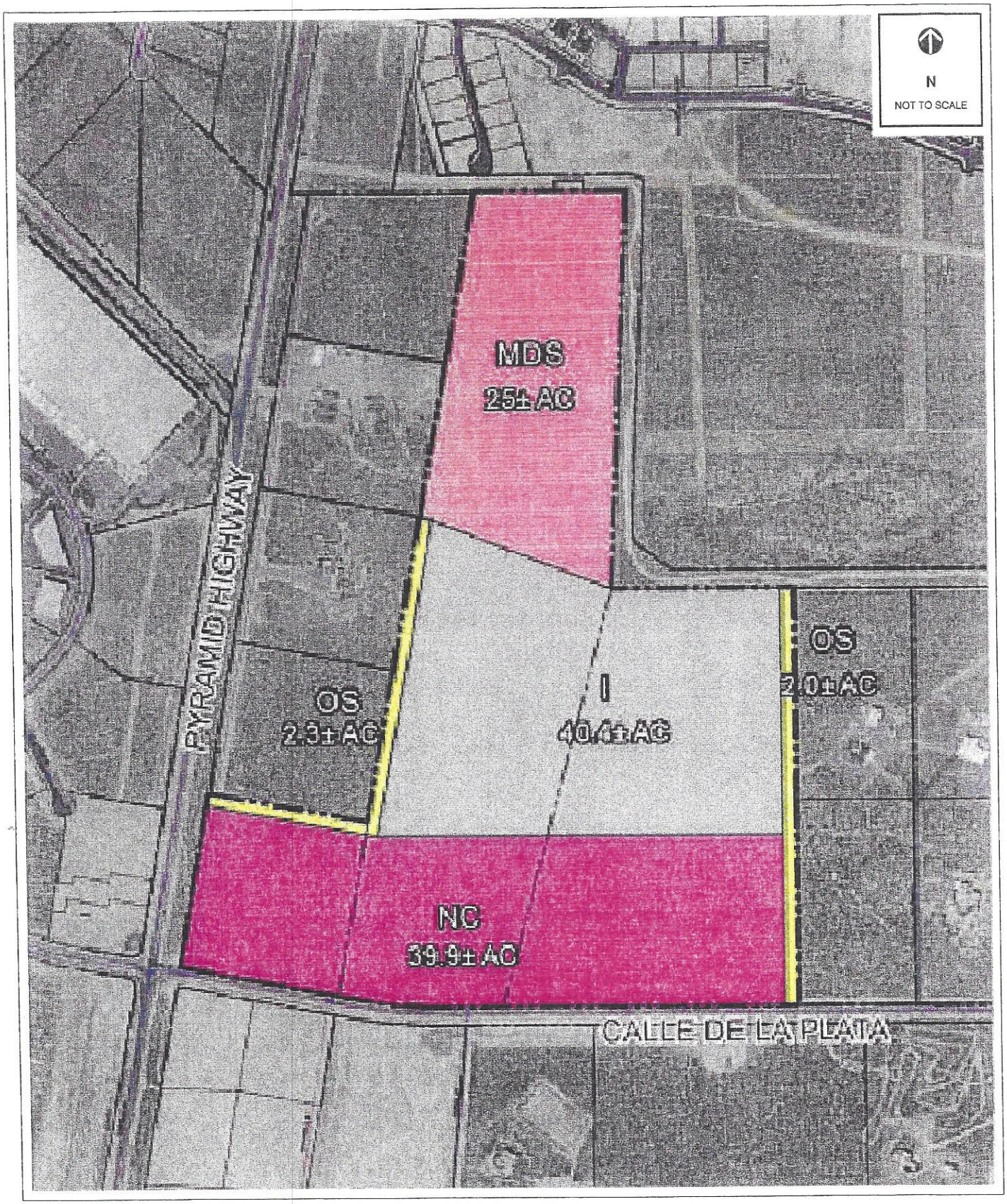

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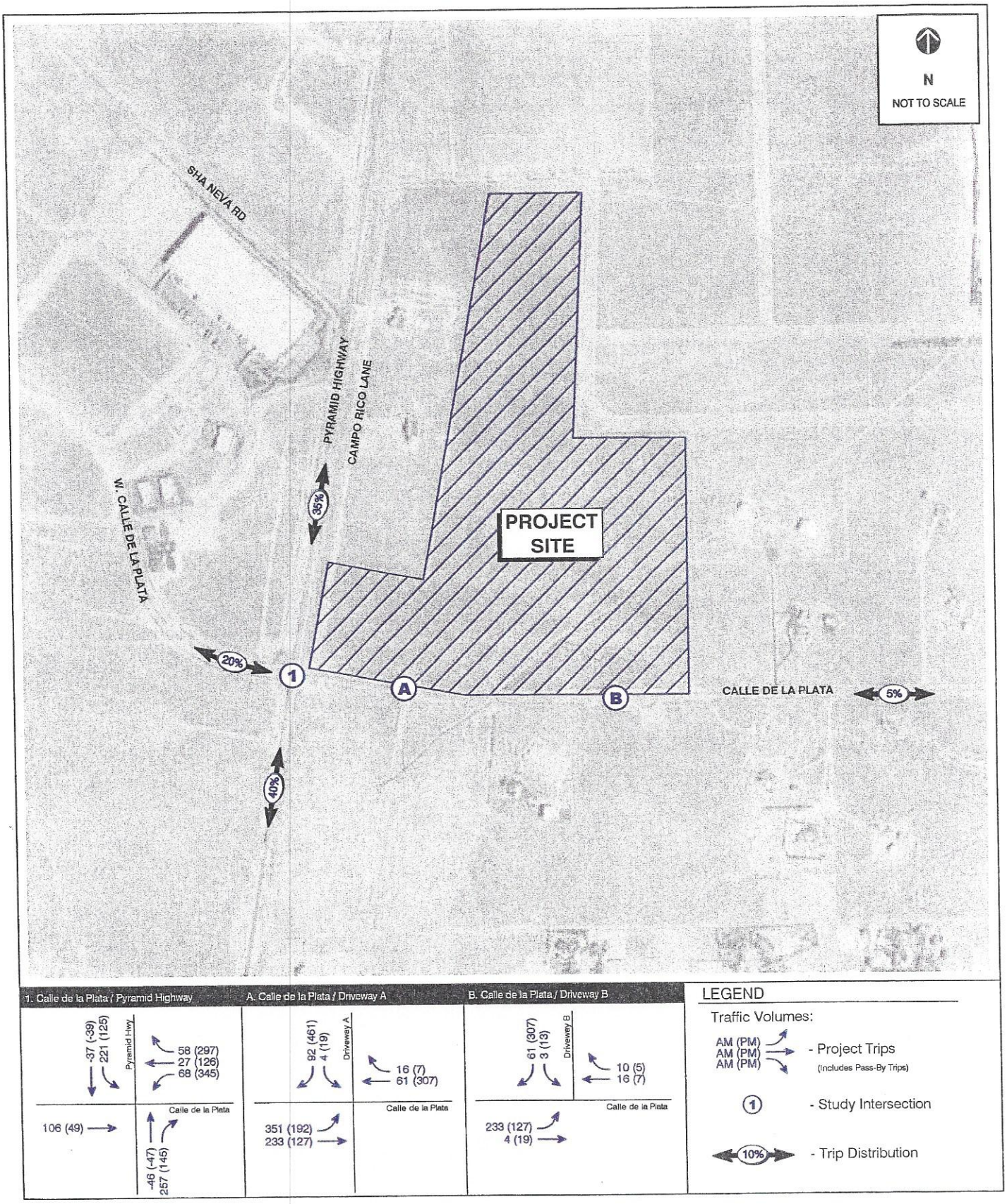
Village at the Peak
Traffic Impact Study
Land Use Plan

Figure 3



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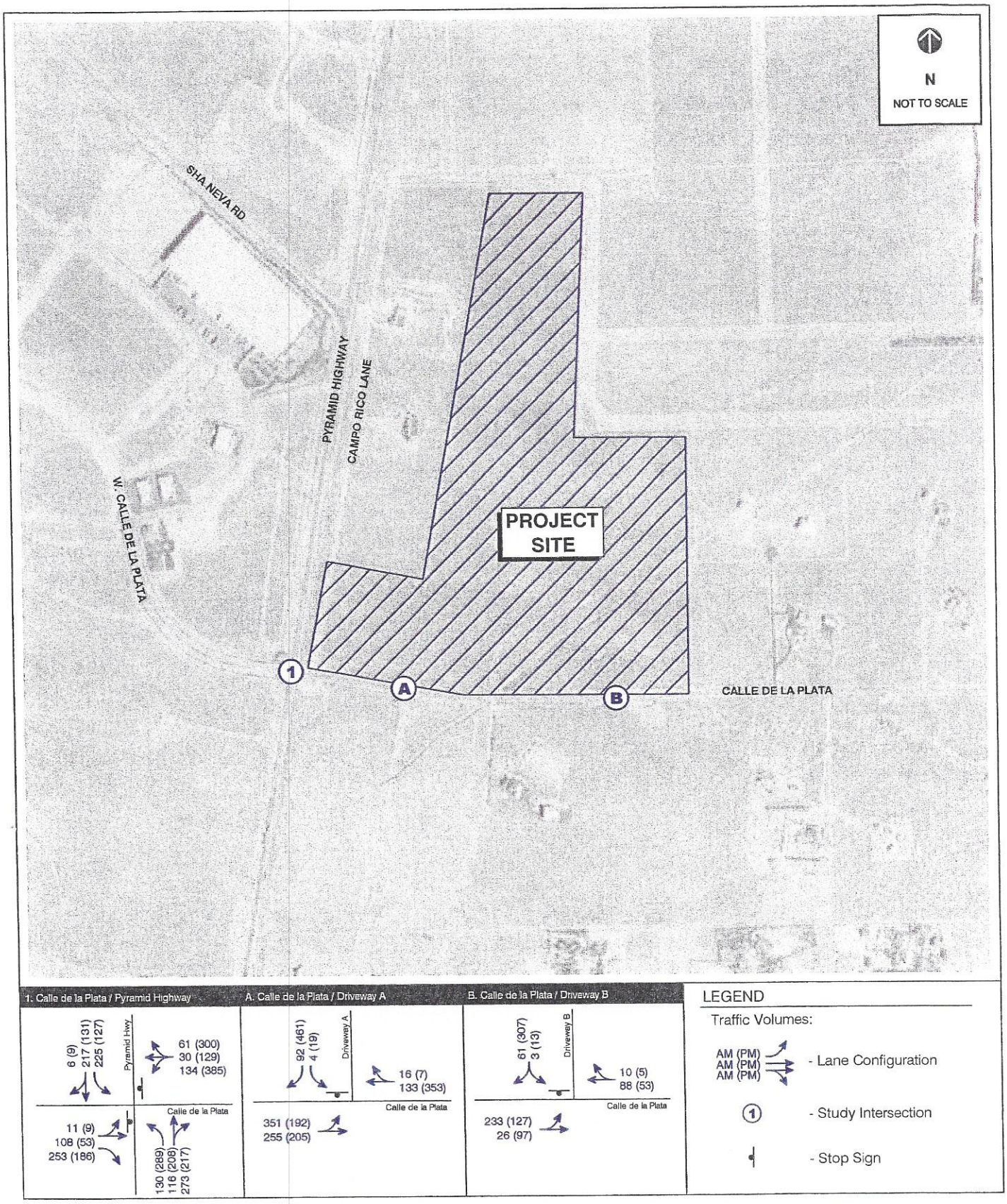
Village at the Peak
Traffic Impact Study
Trip Distribution and Assignment

Figure 4



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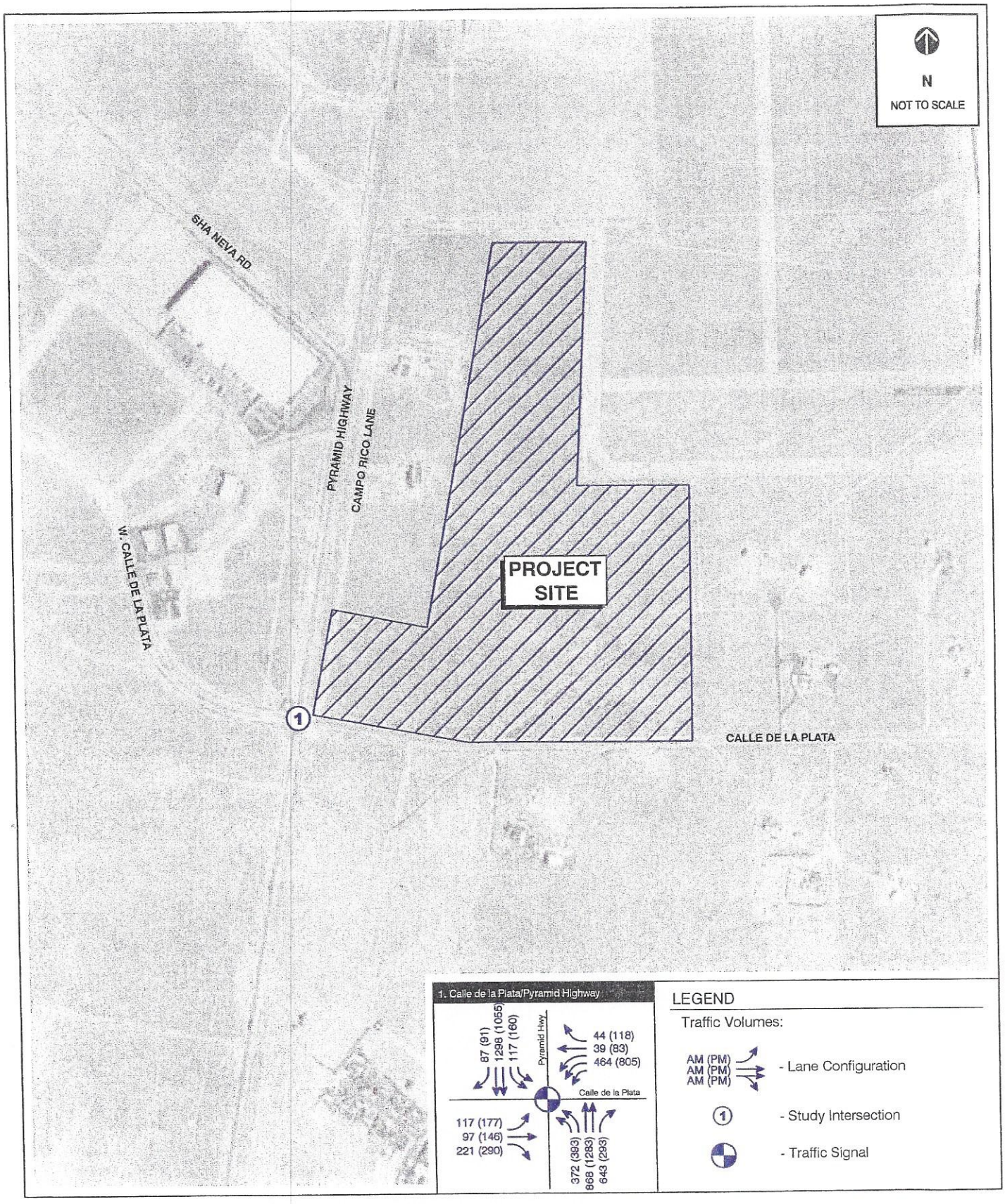
Village at the Peak
Traffic Impact Study
Existing Plus Project Conditions

Figure 5



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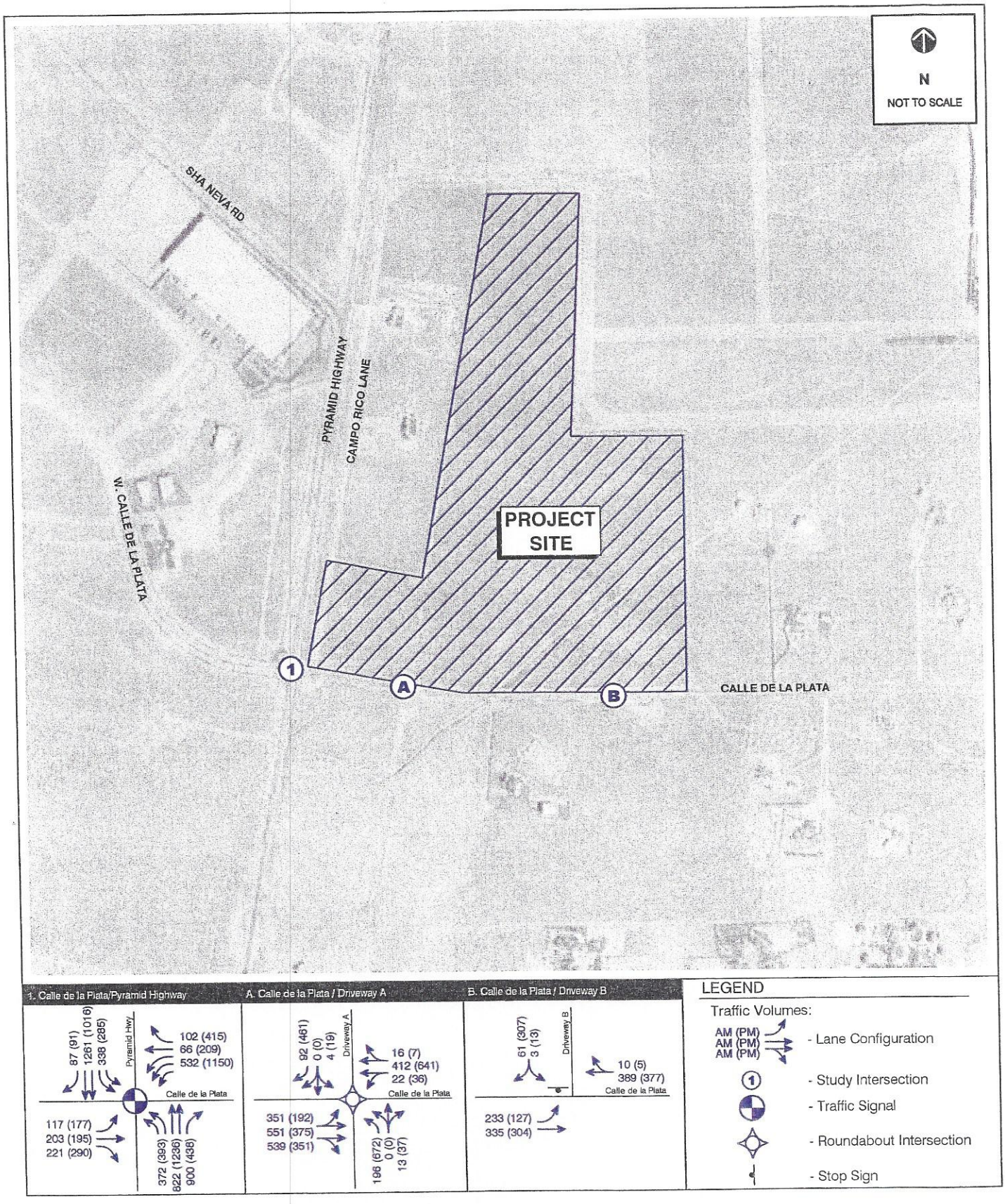
Village at the Peak
Traffic Impact Study
2018 Background Conditions

Figure 6



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Village at the Peak
Traffic Impact Study
2018 Plus Project Conditions

Figure 7

APPENDIX A:

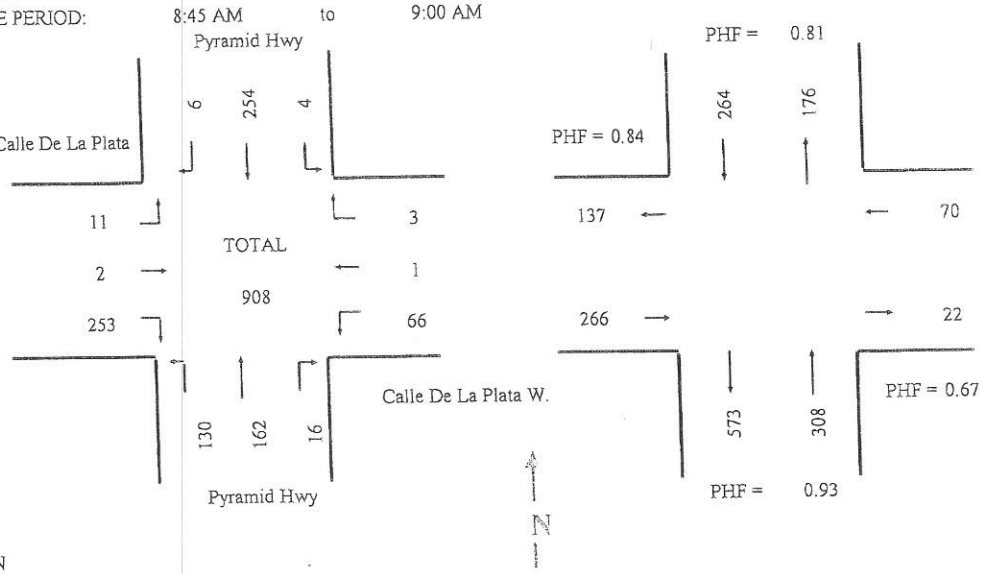
INTERSECTION TURNING MOVEMENT DATA

INTERSECTION TURNING MOVEMENT SUMMARY

INTERSECTION: Calle De La Plata West/Pyramid Hwy
JURISDICTION:
PROJECT TITLE: Calle De La Plata West

TIME: 7:00 AM to 9:00 AM
DATE: Thur 8-21-08
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			
	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**
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

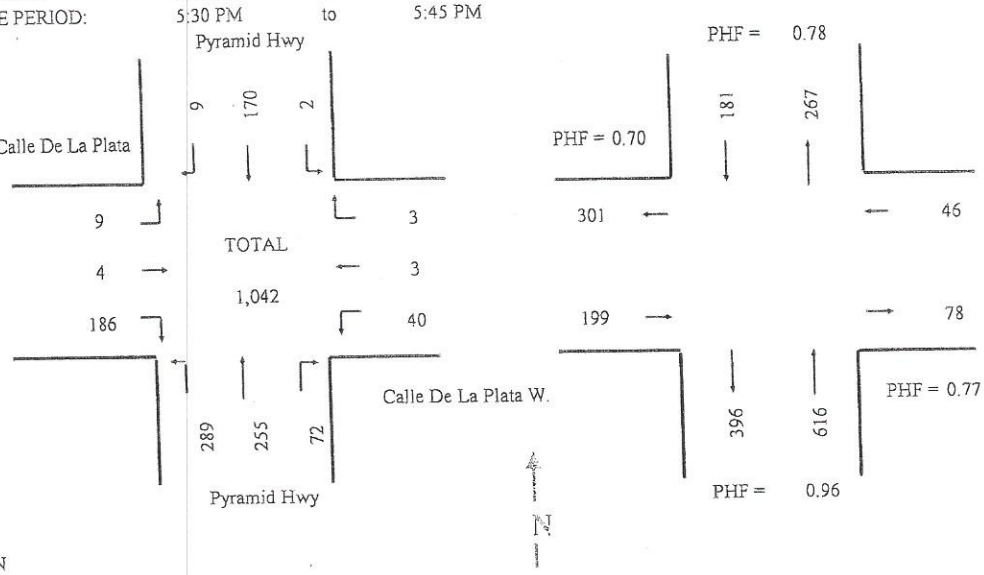
PERIOD COUNTS													
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
7:15 AM	4	1	71	22	1	0	23	36	3	1	65	1	228
7:30 AM	2	1	76	15	0	0	23	39	5	0	80	4	245
7:45 AM	5	0	54	13	1	1	29	32	0	1	40	0	176
8:00 AM	0	0	57	11	0	0	29	38	6	1	55	1	198
8:15 AM	3	0	44	8	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

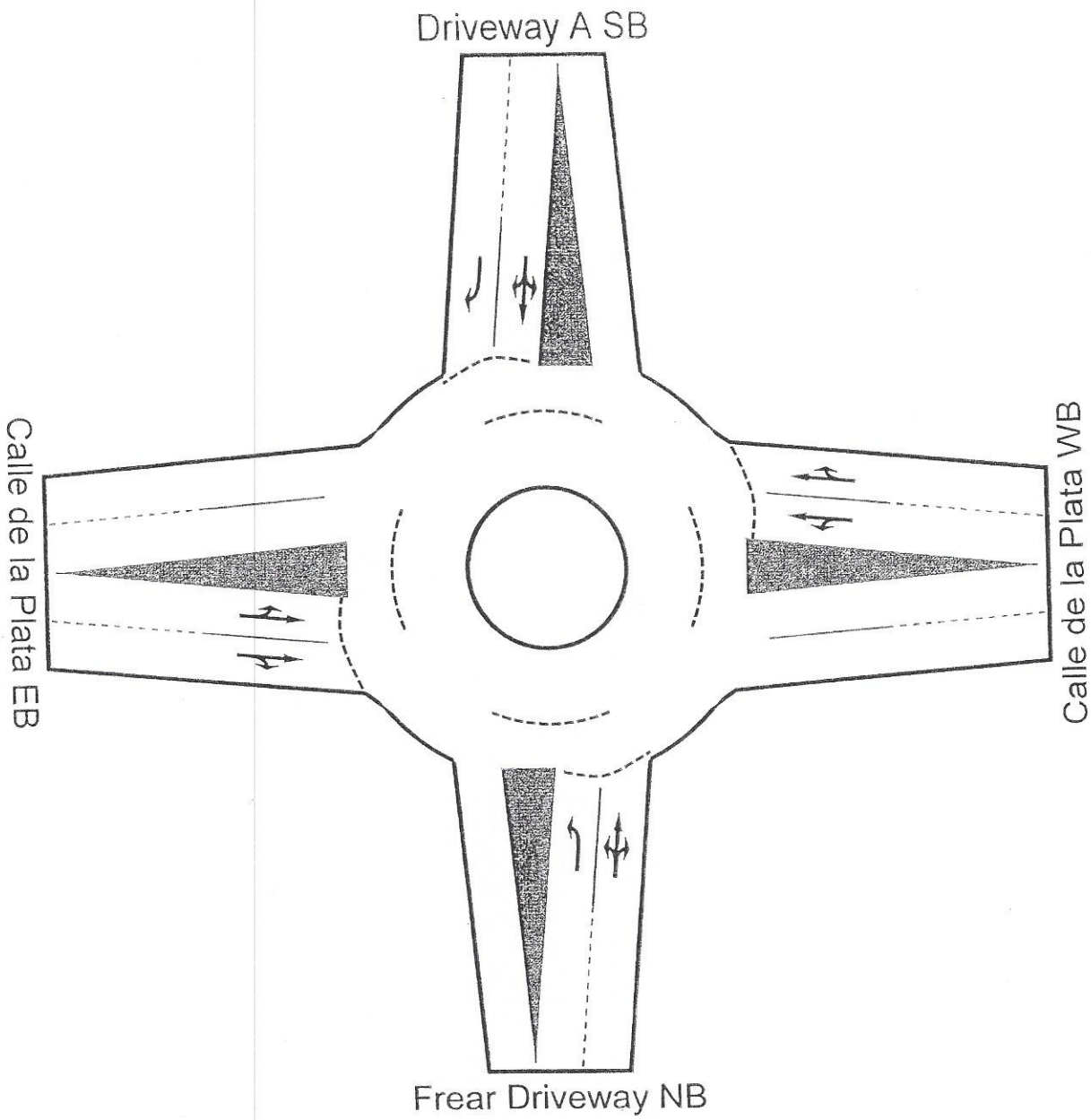
Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Frear Driveway NB										
3L	L	206	1.9	0.163	13.2	LOS B	23	0.63	0.86	21.9
8T	T	1	50.0	0.167	4.2	LOS A	23	0.63	0.62	22.9
8R	R	14	6.7	0.163	7.2	LOS 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

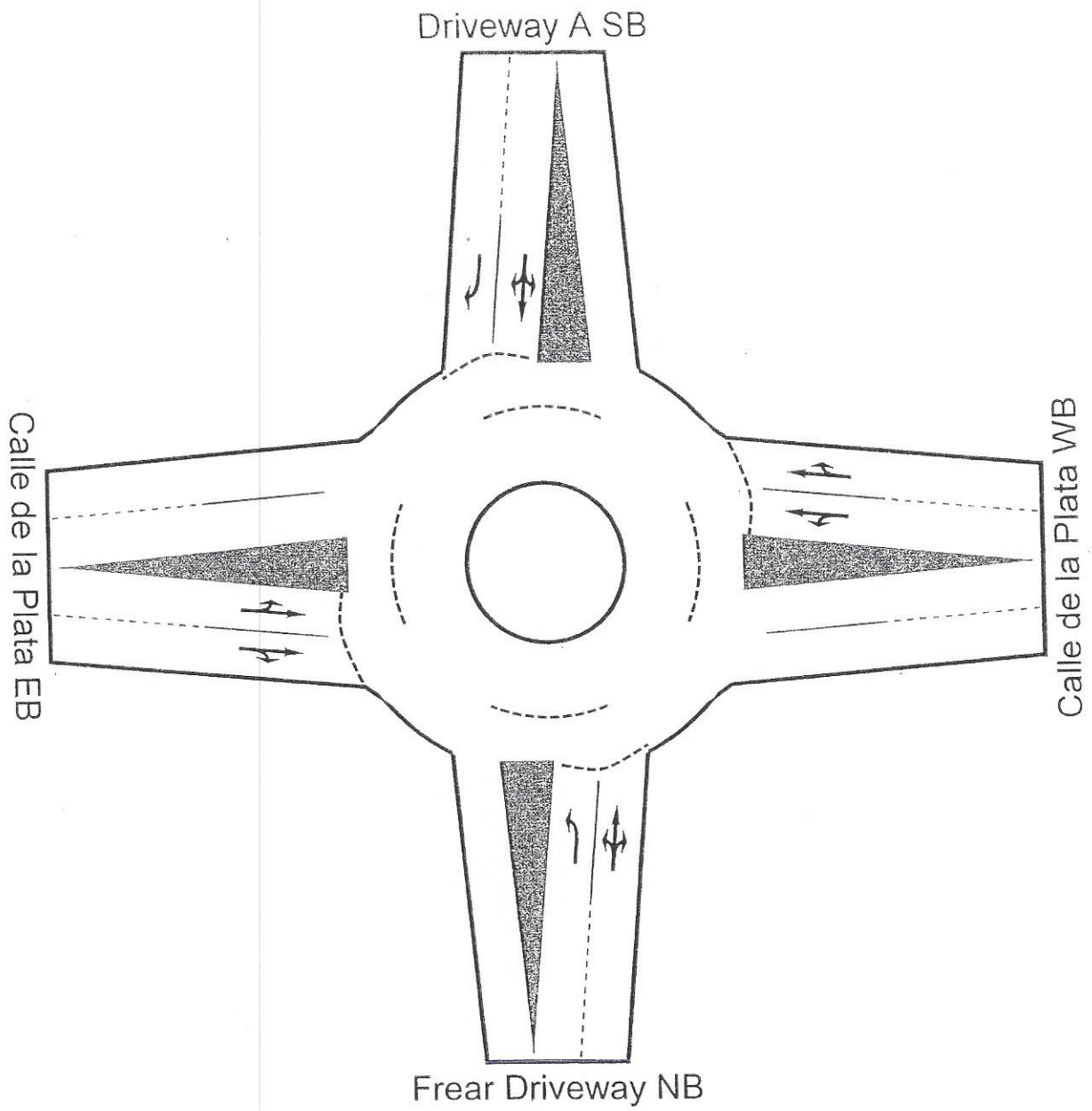
Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Frear Driveway NB										
3L	L	707	2.0	0.451	12.8	LOS B	81	0.65	0.90	22.0
8T	T	1	50.0	0.500	3.9	LOS A	81	0.65	0.61	22.8
8R	R	40	2.5	0.449	6.9	LOS 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

STAR CONSULTING

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

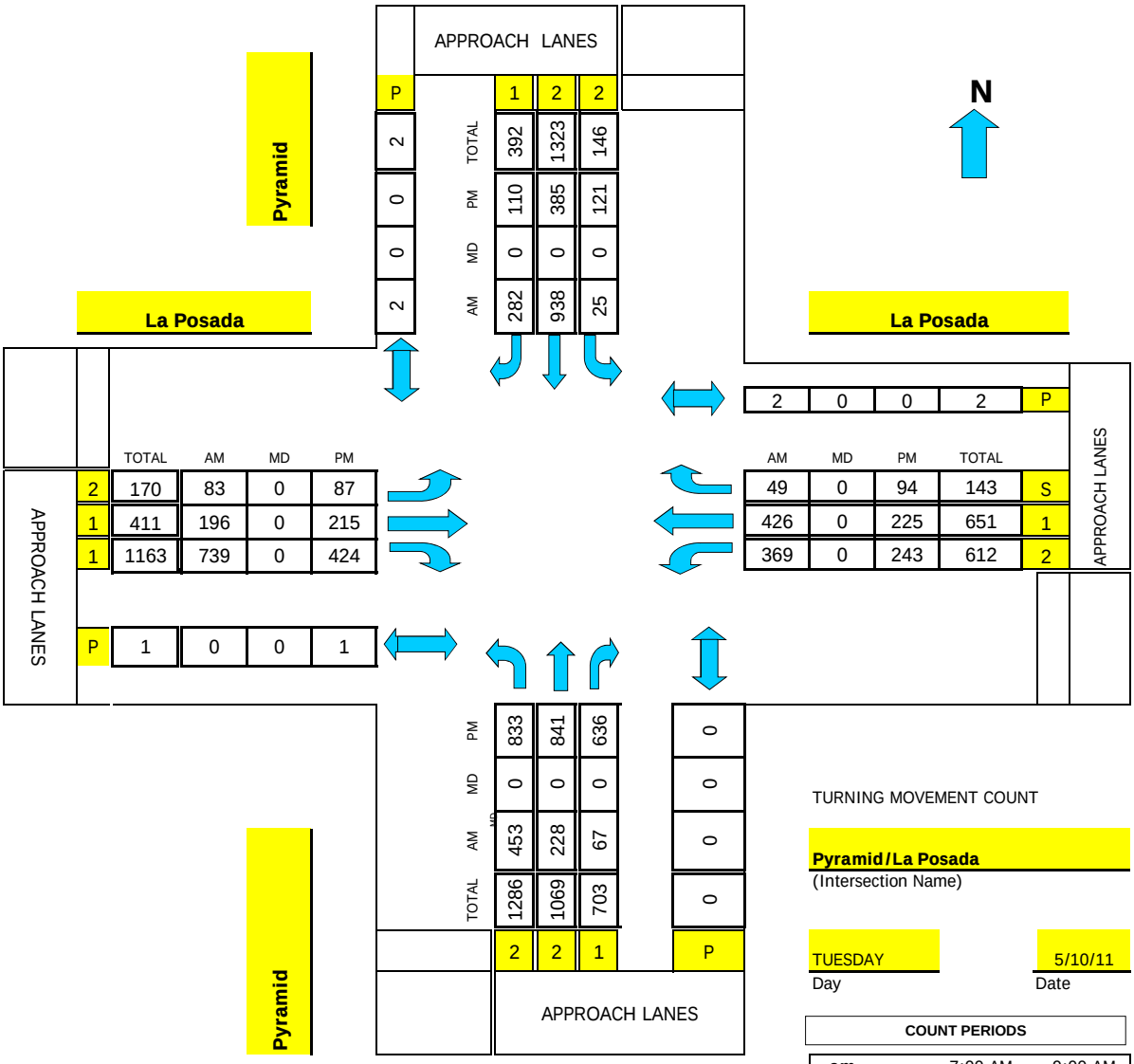
APPENDIX H:

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

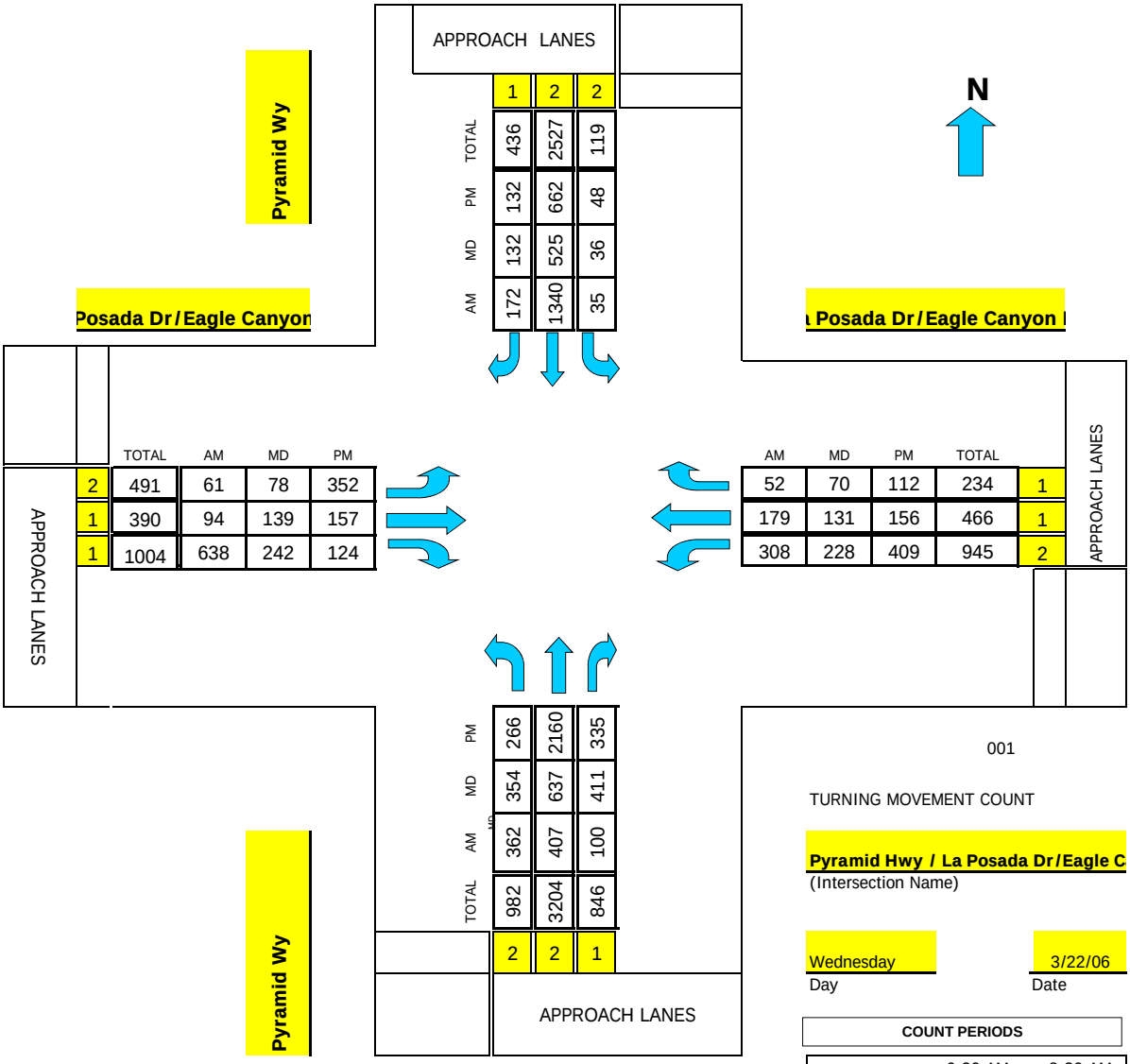
COUNT PERIODS			
am	7:00 AM	-	9:00 AM
noon	11:00 AM	-	1:00 PM
pm	4:00 PM	-	6:00 PM

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

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:

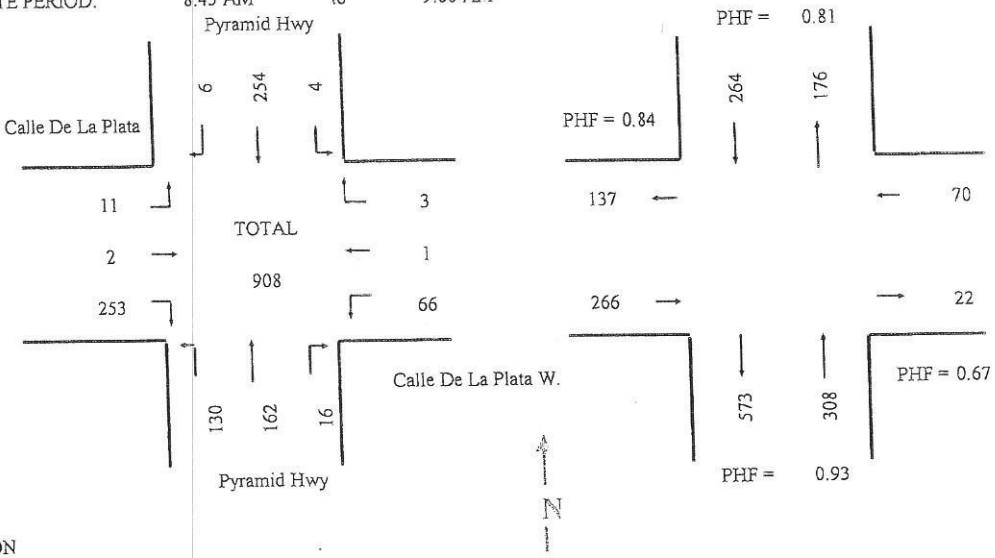
INTERSECTION TURNING MOVEMENT DATA

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			
	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**
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

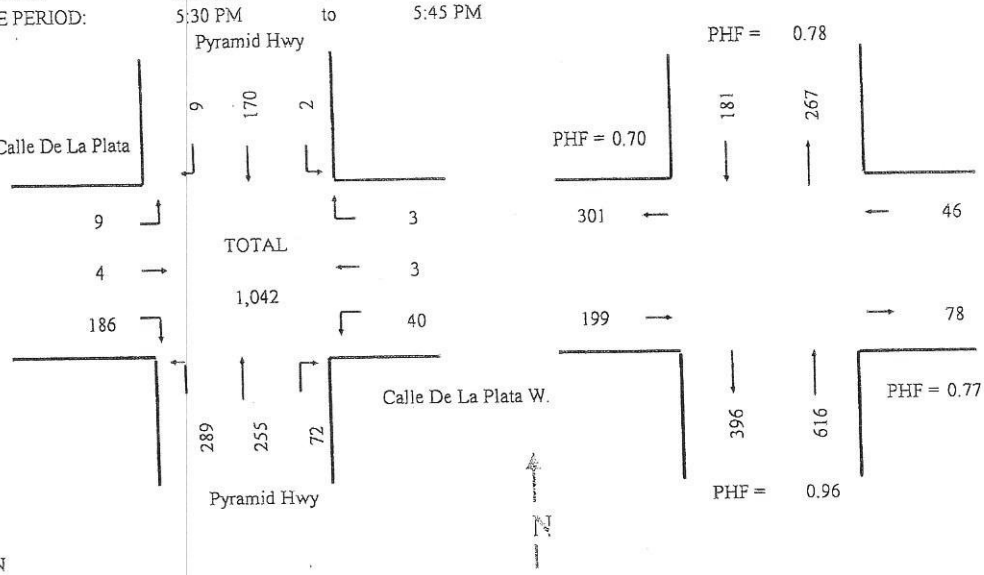
PERIOD COUNTS													
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
7:15 AM	4	1	71	22	1	0	23	36	3	1	65	1	228
7:30 AM	2	1	76	15	0	0	23	39	5	0	80	4	245
7:45 AM	5	0	54	13	1	1	29	32	0	1	40	0	176
8:00 AM	0	0	57	11	0	0	29	38	6	1	55	1	198
8:15 AM	3	0	44	8	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

TRUCKEE MEADOWS WATER AUTHORITY
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June 3, 2015

To: Pam Parenti

Thru: Scott Estes SJE

From: Holly Flores HMF

Re: 350 Calle De La Plata Discovery – Preliminary Water Facility Requirements

PURPOSE:
Determine the least cost facility plan to provide water service to the proposed 186 unit subdivision in the Spanish Springs Valley. The preliminary Tentative Map for the subdivision is attached.

CONCLUSIONS AND RECOMMENDATIONS:
The project will require annexation to TMWA's retail water service territory prior to service. Once successfully annexed, water service can be provided by the Desert Springs System by extending at least two water mains to the property and constructing at least one new pressure regulating station. There are several main extension options shown on the attached exhibit. The preliminary cost estimate for service to the 350 Calle De La Plata project is approximately $1,542,848 not including the off-site main extension costs. The included costs consist of Rate Schedule WSF charges for Area 12 and Supply and Treatment and one new pressure regulating station and do not include off-site main extensions or onsite water facilities.

DISCUSSION:
Location:
The 350 Calle De La Plata subdivision consists of 186 single-family residential units on APN 534-571-01 in Section 23 in T21N, R20E, MDM in the Spanish Springs Valley. The project is located north of Calle De La Plata and east of Pyramid Way in Washoe County. Current development plans include 186 single-family residential units on 58.5 acres with average lot size of 8,000 square feet. The project is located outside the Truckee Meadows Water Authority's retail service territory and must be annexed prior to service. An exhibit is attached showing the project location in relation to existing water facilities and retail service boundary.

Estimated Demands:
The maximum day domestic demand for the project has been estimated at 149 gpm. No separate potable irrigation demand was included in this analysis as it is unknown at this time. In addition, fire requirements are unknown and must be set by the Fire Authority prior to service.

Water Facility Requirements and Cost Estimates:
The project can be served by extending at least two water mains as shown on the attached hydraulic analyses exhibit and construction of at least one new pressure regulating station. Option 1 includes extending a main in Calle De La Plata from the existing 14-inch main near

Isidor Court to the project's eastern boundary and a new pressure regulating station near the project entrance. Option 2 involves connecting to the existing water main on the west side of Pyramid Way and extending a water main through the access road shown and construction of a new pressure regulating station. Both Options 1 and 2 will require crossing Pyramid Way which NDOT will most likely require jack and bore as opposed to open cutting installation methods. Option 3 involves connection to an existing regulated zone at Paradise View Drive or other route through the Donovan Ranch Subdivision as yet unbuilt. Option 3 will require the developer acquire easements acceptable to TMWA across properties owned by others and a route to connect to the street main through planned lots.

Two of the three off-site main extensions will be necessary to meet looping requirements under the NAC445A code and TMWA standards. Since no phasing plan was submitted, it is not known which options the builder may prefer. TMWA prefers Option 1 over Option 2 and will share costs in the main extension only in Calle De La Plata. Option 3 is intended as a secondary supply only and therefore, Option 1 or 2 must be constructed for primary service.

The preliminary water system facility requirements based on the estimated maximum day demand are summarized in the table below:

Table 1: Estimated Major Water Facility Costs

Facility Description	Quantity	Unit	Unit Cost	Total Cost	Comments
Area 12 Facility Charge	149	per gpm	$5,789	$862,561	Rate Schedule WSF
Supply and Treatment Facility Charge	149	per gpm	$4,163	$620,287	Rate Schedule WSF
Pressure Regulating Station	1 or 2	each	$60,000	$60,000	Depends on Option Chosen
Offsite Main Extensions	varies			unknown	Depends on Option Chosen
Estimated Cost				**$1,542,848**	2015 planning level estimate only

ASSUMPTIONS:

1. The 350 Calle De La Plata subdivision will be annexed into the Truckee Meadows Water Authority's retail water service territory.
2. This preliminary study was based on information provided by Star Consulting in May 2015 including a preliminary Tentative Map and average lot sizes of 8,000 square feet.
3. The water facility plan options shown on the included exhibit are preliminary and subject to change.
4. Potable irrigation demands are unknown at this time.
5. Privately owned individual pressure regulating valves will be installed by the builder per TMWA design standards.
6. The estimated maximum day domestic demand for the project is 149 gpm. Actual demands will be determined at the time of application for service.
7. The fire flow requirement and duration has not been set by the governing fire agency and must be set prior to finalizing the water facility plan.

8. All cost estimates are preliminary and subject to change. The costs represented are preliminary planning level cost estimates that are based on the best information available today. Actual costs will be determined at the time of application for service.
9. This estimate does not include the cost of off-site main extensions, onsite facilities, water rights for the project or contribution to the water meter retrofit fund.
10. Dead ends must be eliminated and a looped water system designed, to the extent possible, per NAC 445A requirements. The Health Authority may require changes to the ultimate water facility plan that may in turn affect the included cost estimates.
11. The water facility plan proposed by TMWA must be reviewed for compliance with state and local codes and regulations and approved by the local health authority prior to service.

SUMMARY AND CONCLUSIONS:

The proposed 350 Calle De La Plata subdivision can be served by the Truckee Meadows Water Authority within the Desert Springs System. The partial 2015 planning level estimated cost for service to this project for is $1,542,848. Annexation to the Truckee Meadows Water Authority's retail water service territory is required.

/hmf
Attachments: Preliminary Tentative Map by Star Consulting – reduced
TMWA Retail Service Boundary Figure
Off-Site Main Extension Options Hydraulic Analyses Schematic - Preliminary

cc: Erin Harris, Star Consulting
File 15-4370

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Date: May 7, 2015

To: Pam Parenti

From: Susan Whittet SW

RE: 15-4370, 350 Calle de la Plata - 186 Single Family Residence Lots
Assessor's Parcel Numbers APN: 534-571-01

Applicant: CN Properties, LLC c/o Blackstone Development Group

The New Business/Water Resource team will answer the following assumptions on each new discovery:

- Is the property within Truckee Meadows Water Authority's water service territory?
- Does the property have Truckee River water rights appurtenant to the property or resource credits associated with the property?
  - If yes, what is the status of the water right: Agricultural or Municipal and Domestic use?
- Estimated water demand for residential and or commercial projects.
- Any special conditions, or issues, that are a concern to TMWA or the customer.

The following information is provided to complete the Discovery as requested:

- The subject parcel (APN 534-571-01) is **not** within Truckee Meadows Water Authority's (TMWA's) service territory. An annexation is required; which is paralleling this discovery.

- There are no Truckee River decreed water rights appurtenant to this project. The Applicant and/or owner will be required to follow TMWA's current rules, specifically Rule 7, and pay all fees associated with the water rights needed in order to obtain a will serve commitment letter. In the event owner/applicant owns permitted surface or ground water rights, those water rights would need to be dedicated by applicant/owner towards the project. Any remaining water rights required for the project, may be purchased from TMWA. Ground or surface water rights dedicated by the applicant/owner for this project must be permitted and must be reviewed and deemed acceptable by TMWA.

- Based on the information provided, 186 Single Family Residential (SFR) lots at 8,000 sq.ft/lot are estimated to require a domestic demand of **79.98(AF)**. Plans were not submitted for the recreational elements or irrigation with your new business application; therefore, the estimated demand calculation can only be provided for the proposed single family residential lots. Once final plans are submitted, a more accurate demand will be calculated. *Please note, additional dedication for return flow may be required for irrigation and for domestic use if residential lots are not sewered back to the Truckee River.*

- Any existing right of ways and public easements would need to be reviewed, and if needed the property owner will need to grant TMWA the proper easements and/or land dedications to provide water service to the subject properties. Property owner will be required, at its sole expense, to provide TMWA with a current preliminary title report for all subject properties. Owner will represent and warrant such property offered for dedication or easements to TMWA shall be free and clear of all liens and encumbrances. Owner is solely responsible for obtaining all appropriate permits, licenses, construction easements, subordination agreements, consents from lenders, and other necessary rights from all necessary parties to dedicate property or easements with title acceptable to TMWA.

TRUCKEE MEADOWS WATER AUTHORITY

WATER RIGHTS AND METER FUND CONTRIBUTION
CALCULATION WORKSHEET FOR MULTI-TENANT APPLICATIONS

				Demand (Acre Feet)		
1	Existing demand (current usage) at Service Property			0.00		
2	Number of units	186	x 0.43AF (average per SFR)	79.98		
3	Retail floor space:		x 0.0004 per sq.ft.	0.00		
4	Fixture units:		x 15x 365x 3.07/ 1 mil	0.00		
5	Landscaping: TBD	Turf	sq ft	0.00		
6	Drip: TBD					
7	Other calculated demand:			0.00		
8	New or additional demand at Service Property (lines 2+3+4+5+6)				79.98	
9	**Total Demand at Service Property (lines 1+8)**				79.98	
10	Less: Prior demand commitments at service property			0.00		
11	Less: Other resource credits			0.00		
12	**Total Credits (lines 10+11)**				0.00	
13	Subtotal: Required resource dedication/commitment (lines 9-12)				79.98	
14	Factor amount (0.11 x Line 13)				0.00	
15	No return flow required				0.00	
16	**TOTAL RESOURCES REQUIRED (lines 13+14+15)**				79.98	

17	Price of Water Rights per AF $7,500	$	599,850
18	Will Serve Commitment Letter Preparation Fee ($100 per letter)	$	100
19	Due Diligence Fee ($150.00 per parcel)	$	0
20	Document Preparation Fees ($100.00 per document)	$	0
21	Meter Contribution ($1,830 x 79.98 acre feet of demand)	$	0
22	**TOTAL FEES DUE (lines 17+18+19+20+21)**	$	599,950

Project: 350 Calle de la Plata

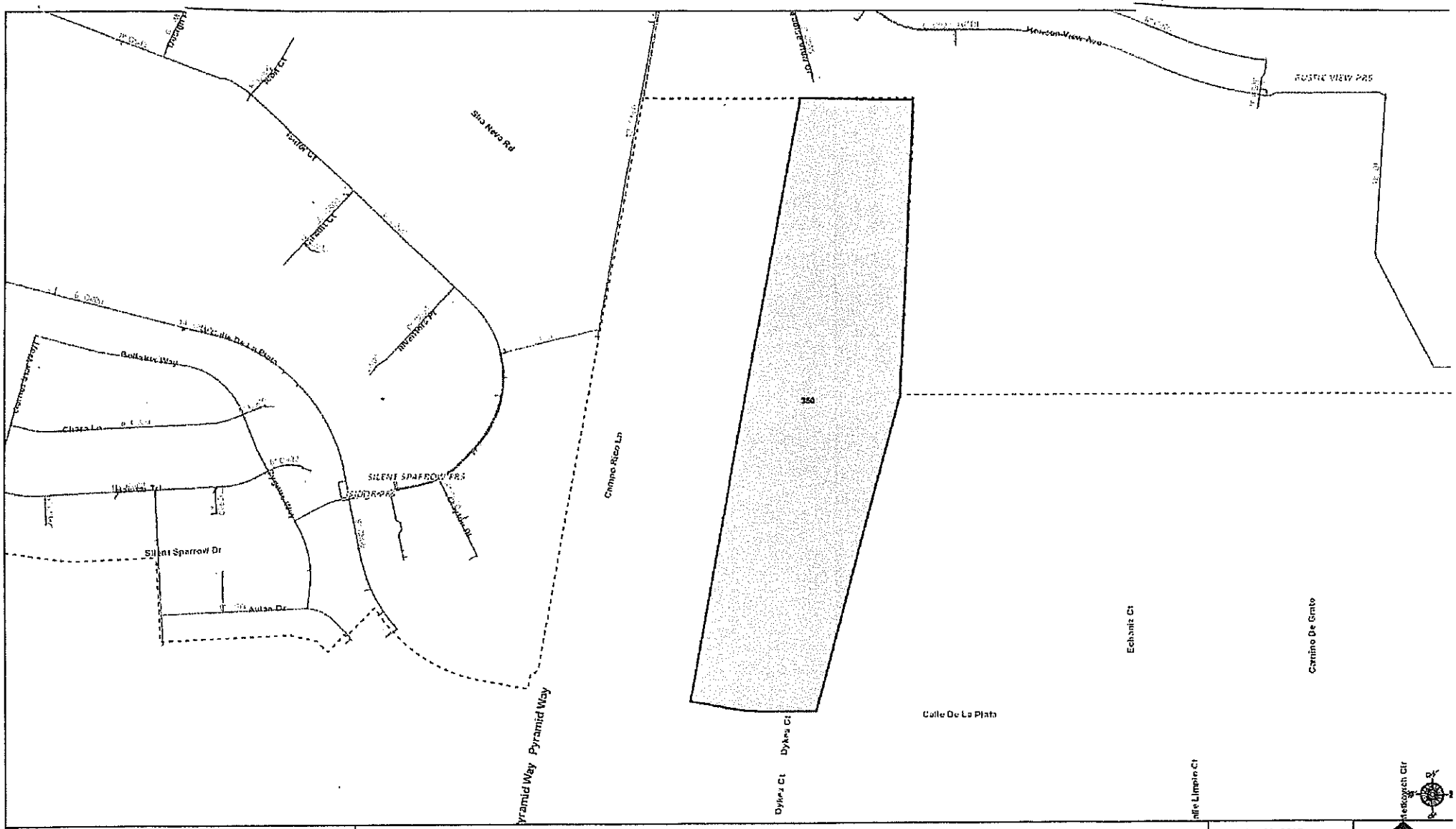
Contact: Blackstone Development Company, Joshua Myers **Quote date:** 5/7/2015

Phone: (775) 352-4200 **Tech contact:** Sue Whittet

APN: 534-571-01 **Project No:** 15-4370

Remarks: **Demand shown using TMWA's groundwater. Additional fees and demand will apply if surface water is dedicated for this project. Fees quoted are valid only within 15 calendar days of quote date.**

Note: There are no landscaping or recreational area plans associated with this Discovery, therefore, no demand was calculated. Applicant only supplied average lot size of 8,000 sq.ft./lot for 186 SFR lots.



TRUCKEE MEADOWS WATER AUTHORITY

Quality. Delivered.

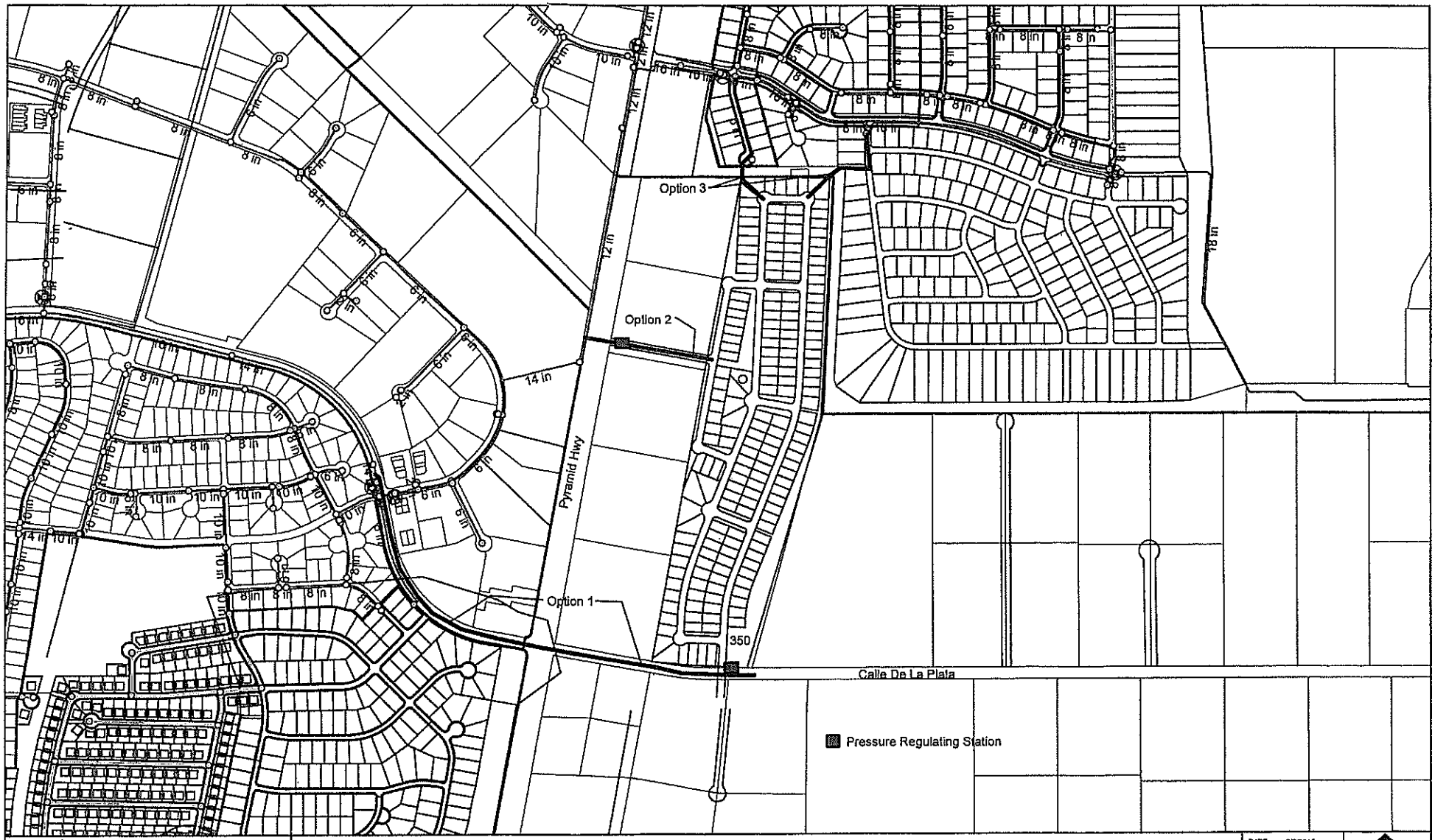
350 CALLE DE LA PLATA DISCOVERY

EXISTING WATER FACILITIES AND RETAIL SERVICE BOUNDARY

DATE: Jun 03, 2015	
MAP BY:	
WORK ORDER #:	
SCALE: NTS	

NORTH

NAD 83 NEVADA STATE PLANE WEST FEET



TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.

350 Calle De La Plata Discovery - 186 SFR

Potential Off-Site Water Service Extension Options

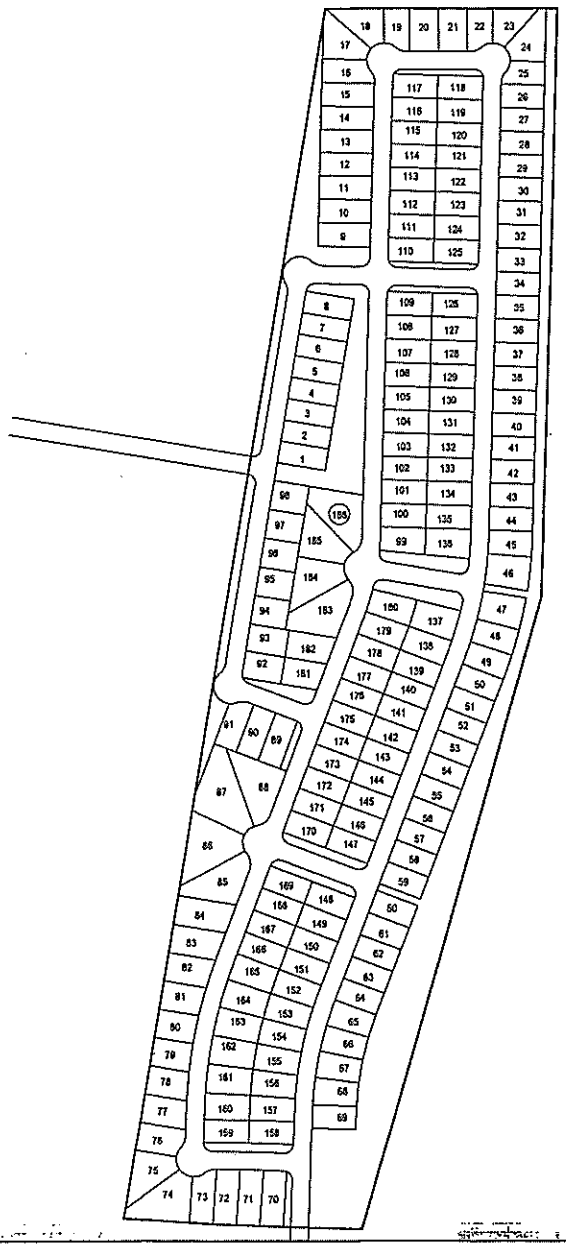
Desert Springs System

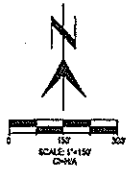
15-4370

DATE:	6/2/2015
MAP BY:	hmf
REQUESTED BY:	
SCALE:	1 Inch = 616 feet

NORTH

NAD 83 NEVADA STATE PLANE WEST FEET





DONOVAN RANCH
SUBDIVISION

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 56.5 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 28
10. SERVED BY THE TRUCKEE MEADOWS FIRE PROTECTION DISTRICT

CALL FOR THE BLUE STAKES
800-782-5348

NO.	DATE	REVISION	BY	CHKD.	APPD.

PRELIMINARY TENTATIVE MAP
SPANISH SPRINGS

LOTS 1-186 AND COMMON AREA

XXX
XXX
XXX

STAR CONSULTING
429 W. PLUMB LANE
RENO, NV 89509
(775) 323-4220
PROJECT NO. [XXX]

DRWN. BY	EEH	
DES'D. BY	EEH	CASE NO. XXX
CHKD. BY	JWH	SHEET NO. 1 OF 1

Conceptual Drainage Study
FOR BLACKSTONE ESTATES TENTATIVE MAP
APN 534-571-01

Prepared For:

SP 58 LLC
439 W Plumb Lane
Reno, NV 89509

Prepared By:

Lumos and Associates, Inc.
800 East College Parkway
Carson City, Nevada 89706
(775) 883-7077 (office)
(775) 883-7114 (fax)

JN 8973.001
May 2016

5-31-16

Table of Contents

TECHNICAL DRAINAGE STUDY
For
BLACKSTONE ESTATES TENTATIVE MAP
APN: 534-571-01

I. Introduction

A. Site Location

The project site is located at 350 Calle de la Plata Drive in Spanish Springs, Washoe County, Nevada. Assessor's Parcel Number (APN) for the property is 534-571-01 and encompasses 58 acres. The parcel is located in the northeast and southeast quarters of Section 23, Township 21 North, Range 20 East. Adjacent developments include two single family homes to the west, a planned development (Sugarloaf Ranch Estates) to the east and a development of single family homes (Donovan Ranch Subdivision) to the north.

B. Site Description

The 58 acre project site is currently undeveloped and consists of 100% low desert vegetation. Soil consists of 81.3% Haybourne loamy sand and 18.7% Wedertz sandy loam that slopes from 2-8% to the west towards Pyramid Highway. The Haybourne is classified as soil group "A" while the Wedertz is classified as soil group "C". There is a major drainage channel that flows through the southwestern corner of the project site called the "Spanish Springs Wash". This portion of the project site is zoned by FEMA as zone AO having flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined as outlined on the Flood Insurance Rate Map 32031C2865G (revised March 2009) included in the appendix. A Letter of Map Revision (LOMR) was done (May 29, 2009) that removes most of the project site from flood zone AO and is provided in the appendix. The small portion that remains is subject to 1% annual chance of flooding with a depth of one foot.

C. Proposed Project Description

This conceptual drainage study was performed for the submittal for the tentative map application for Blackstone Estates. The proposed Blackstone Estates consists of 161 single family homes with lots that average between 0.2 and 0.4 acres. Three retention/detention basins are proposed onsite. Two are intended to retain runoff that occurs onsite and one will detain offsite flow. The proposed project site will consist of two drainage basins that will flow into respective retention basins. Drainage basin A-1 encompasses 43.9 acres of the northern portion of the project site. Basin B-1 consists of 12.9 acres of the southern portion of the project site. The remaining 1.2 acres is dedicated to the conveyance and detention of the offsite flow.

D. Previous Drainage Studies

There are several previous drainage studies that are pertinent to the project site and were used as reference materials for analysis of the Blackstone Estates hydrology. The "Master Drainage Study for Donovan Ranch" performed by Matrix Engineering & Consulting, Inc. dated September 2004, herein referred to as the Matrix Report, was used for reference of offsite flows. The "Preliminary Hydrology Report for Sugarloaf Estates Tentative Subdivision" prepared by Axion Engineering dated February 2016, herein referred to as the Axion Report, was used to reference offsite flows. LOMR case number 09-09-1277X dated May 29, 2009 was used to determine the floodplain limits for the Spanish Springs Wash within the project area.

II. Historic Drainage System

A. Major Basins and Offsite Contributions

The project site is located in the Griffith Canyon watershed. The watershed originates to the east of the project site and flows west. A small portion of the project site is located in the Spanish Springs Wash that has an annual 1% chance of flooding with a depth of one foot. Basins that affect the project site are to the east and slope from east to west towards the project location. The project is located directly north of a major sedimentation/detention basin for the Griffith Canyon watershed. The tributary basins typically have the same topography and ground cover as the project site with the addition of sporadic single family homes. However, basins C and D originate at Sugarloaf Peak where the topography can be much steeper.

B. Sub-basin and Site Drainage

1. Offsite Flows

A map of offsite basins is provided in the appendix. Per the Matrix report Basin A almost completely drains into the gravel pit and retained there. Basin B drains across Calle de la Plata to the south and enters a defined drainage path that eventually enters a constructed channel that runs parallel to Calle de la Plata on the south side adjacent to the project location. Blue line stream on the USGS map shows this channel crossing back to the north, however, a channel was constructed to intercept this flow and keep it on the southern side of the road. Basin C drains towards the project location but is intercepted by a channel that crosses the southeastern corner of the property. Basins D and E flow from east to west towards and are tributary to the project site. However, both basins are subject to the Sugarloaf Ranch Estates Subdivision. This development could have substantial impact on the flow that enters the project site. It is recommended that further analysis is performed of offsite flows with the final map submittal for the Blackstone Estates Final Map.

For the purposes of this conceptual drainage report offsite flows were determined using HEC-HMS. Loss was calculated using SCS curve number method and transformation was calculated using SCS Unit Hydrograph. For all three basins a curve number of 49 was used. This represents a basin of desert shrub, in good hydraulic condition of soil group "A". A printout from HEC-HMS is included in the

appendix. Offsite flows from sub-basins C, D and E that flow on to the site are as follows:

Table 1-Runoff from Offsite Drainage Basins

Basin	5-Year, 24-Hour (cfs)	100-Year, 24-Hour (cfs)	100-Year, 24-Hour (Ac-ft)
Basin C	1.3	3.3	3.1
Basin D	0.5	2.9	2.4
Basin E	0.0*	1.3	1.0

*Basin flows were lower than 0.05 cfs and were not measured by HEC-HMS

2. *Onsite Flows*

Onsite flows were calculated using the Rational Method. The project site was divided into two sub-basins that would reflect the tentative map condition. The larger sub-basin A-1 encompasses 43.86 acres and the smaller sub-basin B-1 is 12.9 acres. The remaining area is dedicated to conveying and retaining offsite flows from offsite basins C and D. The pre-developed condition a Runoff Coefficient of 0.4 was chosen to reflect Open Space with slopes 5-15%. The lower end of the range of 0.4-0.5 was chosen because slopes onsite range from 2-8%. Rational Method calculations are provided in the appendix. Onsite pre-developed flows from basins A-1 and B-1 are as follows:

Table 2-Runoff from Onsite Drainage Basins – Pre-Development

Basin	5-Year, 24-Hour (cfs)	100-Year, 24-Hour (cfs)
Basin A-1	26.493	66.496
Basin B-1	7.760	19.491

III. Proposed Drainage System

Onsite flows were calculated using the Rational Method. The project site was divided into two sub-basins that would reflect the tentative map condition. The larger sub-basin A-1 encompasses 43.86 acres and the smaller sub-basin B-1 is 12.9 acres. The remaining area is dedicated to conveying and retaining offsite flows from offsite basins C and D. The post-developed condition a Runoff Coefficient of 0.5 was chosen to reflect Single Family Residential. The lower end of the range of 0.4-0.5 was chosen because the proposed lot are large and will be mostly landscaped. Rational Method calculations are provided in the appendix. Onsite post-developed flows from basins A-1 and B-1 are as follows:

Table 2-Runoff from Onsite Drainage Basins – Post-Development

Basin	5-Year, 24-Hour (cfs)	100-Year, 24-Hour (cfs)
Basin A-1	33.116	83.120
Basin B-1	9.707	24.364

This represents an increase of 16.624 cfs and 25% for the 100-year storm event for basin A-1 and an increase of 4.873 cfs and 25% for the 100-year storm event for basin B-1. The runoff from basin A-1 is going to be directed northwesterly via curb and gutter to inlet locations at the intersection of Alexis Way and North 1. From there the runoff will be conveyed via storm drain to the retention basin at the northwest corner of the project location. The runoff from basin B-1 will be directed southeasterly via curb and gutter to a low point on Lily Lane at approximately station 6+00. From there runoff will be conveyed via storm drain to the retention basin located in the southwestern corner of the project site.

Offsite flows from basins C and D will be conveyed to the retention basin located at the southeastern corner of the project site. Offsite flows from basin E are going to be intercepted at the eastern edge of the project and conveyed around the project via ditch to the retention basin on the northwestern corner of the project site. Piping and street capacity will be sized and verified with the final design. Retention basin volume calculations are provided in the appendix and all retention basins will be sized to accommodate the increase in peak flows. Method of release and rate of release will also be included in the final design.

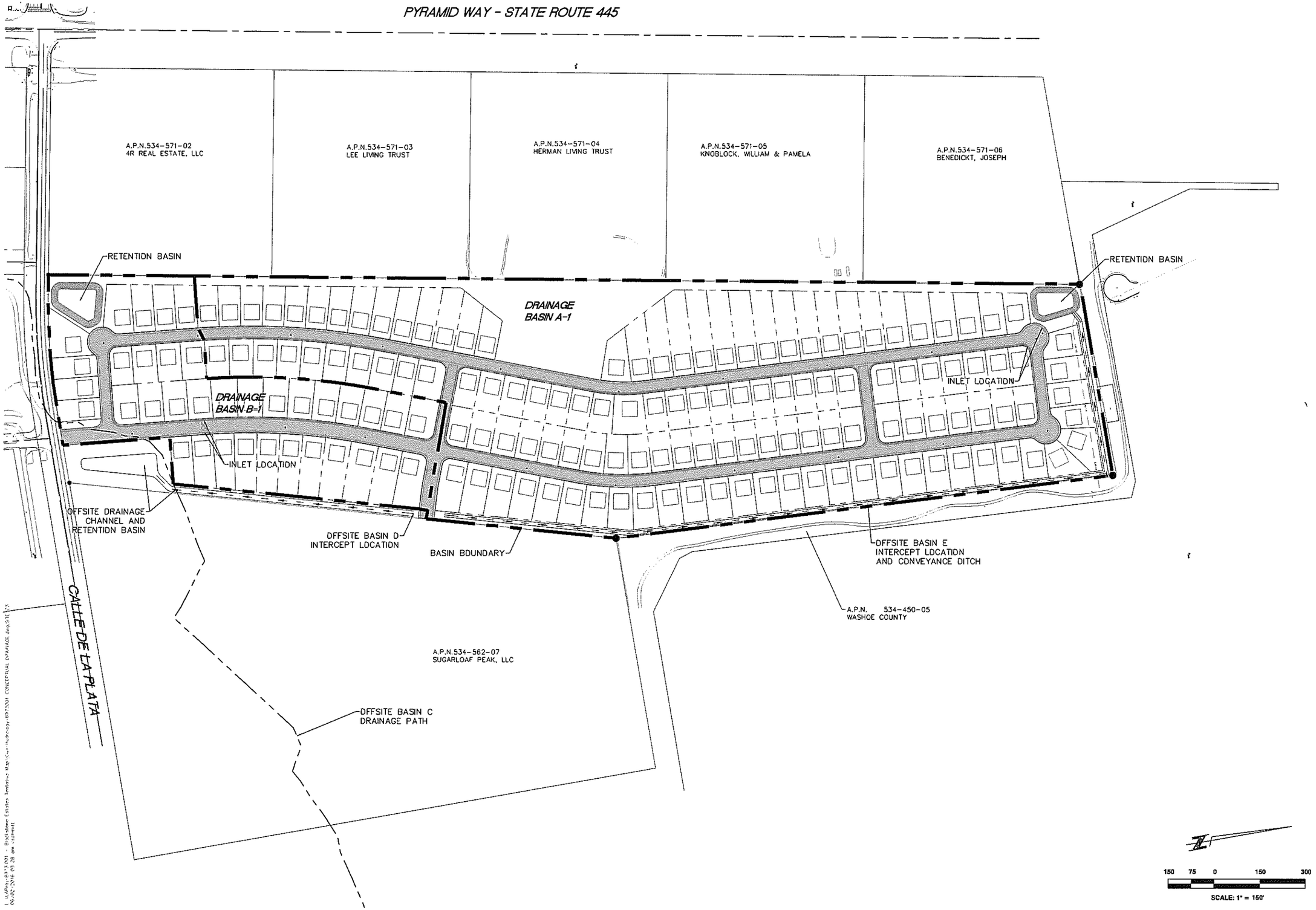
IV. Areas within flood hazard zones

The small portion of the project site that falls within zone AO is dedicated for use for conveying offsite flows and retention storage. There will be no construction inside of the flood zone besides the construction of channel and retention basin. The construction of the channel and retention basin could aid in lowering the flood elevation for this area, but further analysis would be needed to determine its effects. The proposed drainage improvements for the project as described above are in compliance with FEMA and Douglas County Development Standards.

V. Conclusions

The proposed project will provide homes for 161 families in the Spanish Springs area. The proposed drainage modifications will be a benefit to the area because several of the offsite basins are going to be retained on site. Any adverse effects due to the increase in runoff will be negated by the use of onsite retention basins.

VI. Appendix



LUMOS & ASSOCIATES

800 EAST COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
TEL (775) 883-7077
FAX (775) 883-7114

WWW.LUMOSINC.COM

CIVIL ENGINEERING
GEOTECHNICAL ENGINEERING
PLANNING
LANDSCAPE ARCHITECTURE
SURVEYING / GIS
CONSTRUCTION SERVICES
MATERIALS TESTING

SP58, LLC.

BLACKSTONE ESTATES
TENTATIVE MAP
DRAINAGE MAP

WASHOE COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

EX1

DATE:	MAY 2016
DRAWN BY:	CAS
DESIGNED BY:	RB
CHECKED BY:	RB
JOB NO.:	8973.001

LUMOS & ASSOCIATES

Blackstone Estates
Drainage Calculation
Rational Method
May 2016

LUMOS & ASSOCIATES

Basin A-1 Pre-Development

5-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Open Space 5-15% Slopes	0.4-0.5	0.4
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Open Space	Other	Units
1,910,655	0	Sq. Ft.
43.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Open Space=	0.4	43.86	17.55
Other Areas=	0.3	0.00	0
Total		43.86	17.55
C (Total/Total Area) =		0.40	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
1.51	26.493

****NOTE: Tc Minimum = 10 Minutes**

100-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Open Space 5-15% Slopes	0.4-0.5	0.40
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Open Space	Other	Units
1,910,655	0	Sq. Ft.
43.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Open Space=	0.4	43.86	17.55
Other Areas=	0.3	0.00	0
Total		43.86	17.55
C (Total/Total Area) =		0.40	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
3.79	66.496

****NOTE: Tc Minimum = 10 Minutes**

LUMOS & ASSOCIATES

Blackstone Estates
Drainage Calculation
Rational Method
May 2016

LUMOS & ASSOCIATES

Basin A-1 Post-Development

5-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Single Family Residential=	0.45-0.60	0.5
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Single Family	Other	Units
1,910,655	0	Sq. Ft.
43.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Single Family=	0.5	43.86	21.93
Other Areas=	0.3	0.00	0
Total		43.86	21.93
C (Total/Total Area) =		0.50	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
1.51	33.116

**NOTE: Tc Minimum = 10 Minutes

100-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Single Family Residential=	0.45-0.60	0.50
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Single Family	Other	Units
1,910,655	0	Sq. Ft.
43.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Single Family=	0.5	43.86	21.93
Other Areas=	0.3	0.00	0
Total		43.86	21.93
C (Total/Total Area) =		0.50	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
3.79	83.120

**NOTE: Tc Minimum = 10 Minutes

LUMOS & ASSOCIATES

Blackstone Estates
Drainage Calculation
Rational Method
May 2016

LUMOS & ASSOCIATES

Basin B-1 Pre-Development

5-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Open Space 5-15% Slopes	0.4-0.5	0.4
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Open Space	Other	Units
560,043	0	Sq. Ft.
12.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Open Space=	0.4	12.86	5.14
Other Areas=	0.3	0.00	0
Total		12.86	5.14
C (Total/Total Area) =		0.40	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
1.51	7.766

****NOTE: Tc Minimum = 10 Minutes**

100-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Open Space 5-15% Slopes	0.4-0.5	0.40
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Open Space	Other	Units
560,043	0	Sq. Ft.
12.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Open Space=	0.4	12.86	5.14
Other Areas=	0.3	0.00	0
Total		12.86	5.14
C (Total/Total Area) =		0.40	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
3.79	19.491

****NOTE: Tc Minimum = 10 Minutes**

LUMOS & ASSOCIATES

Blackstone Estates
Drainage Calculation
Rational Method
May 2016

LUMOS & ASSOCIATES

Basin B-1 Post-Development

5-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Single Family Residential=	0.45-0.60	0.5
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Single Family	Other	Units
560,043	0	Sq. Ft.
12.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Single Family=	0.5	12.86	6.43
Other Areas=	0.3	0.00	0
Total		12.86	6.43
C (Total/Total Area) =		0.50	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
1.51	9.707

****NOTE: Tc Minimum = 10 Minutes**

100-year, 10-min Storm Event
Formula: Q = C * i * A

1) Runoff Coefficient C

	Range	Design Value
Single Family Residential=	0.45-0.60	0.50
Other Areas =	0.1 - 0.3	0.3

2) Total Area (A)

Single Family	Other	Units
560,043	0	Sq. Ft.
12.86	0.00	Acres

3) Weighted "C" Value

	Design Value	Areas (Acres)	Total
Single Family=	0.5	12.86	6.43
Other Areas=	0.3	0.00	0
Total		12.86	6.43
C (Total/Total Area) =		0.50	

4) Time of Concentration (Tc = Lo + Lsc + Lc)

Overland Flow - Lo (Min)	Shallow Concentrated Flow - Lsc (Min)	Channel Flow Lc (Min)
2.4	0.0	0.0
	Time of Concentration (Tc) =	2.4

5) Peak Flow Rate (Q = CiA)

Intensity @ Tc (in/hr)	Peak Flow Rate (cfs)
3.79	24.364

****NOTE: Tc Minimum = 10 Minutes**

Blackstone Estates
A-1 Retention Basin Calculations
100 Year Frequency @ 24 Duration

$$Volume = c * depth * area$$

	c (Runoff Coefficient)	d (Depth, in)	a (Area, sf)	Volume (cu. Ft)
Future	0.5	3.49	1910655	277841.0813
Existing	0.4	3.49	1910655	222272.865
Design Volume	Volumes based the delta value of the existing vs proposed			55568.21625

Blackstone Estates
B-1 Retention Basin Calculations
100 Year Frequency @ 24 Duration

$$Volume = c * depth * area$$

	c (Runoff Coefficient)	d (Depth, in)	a (Area, sf)	Volume (cu. Ft)
Future	0.5	3.49	560044	81439.73167
Existing	0.4	3.49	560044	65151.78533
Design Volume	Volumes based the delta value of the existing vs proposed			16287.94633

Project: Blackstone Estates Simulation Run: 5-year, 24-hour

Start of Run: 01Jan2017, 00:00
End of Run: 02Jan2017, 00:00
Compute Time: 01Jun2016, 14:56:29

Basin Model: Blackstone Estates
Meteorologic Model: 5-Year
Control Specifications: 24-hour

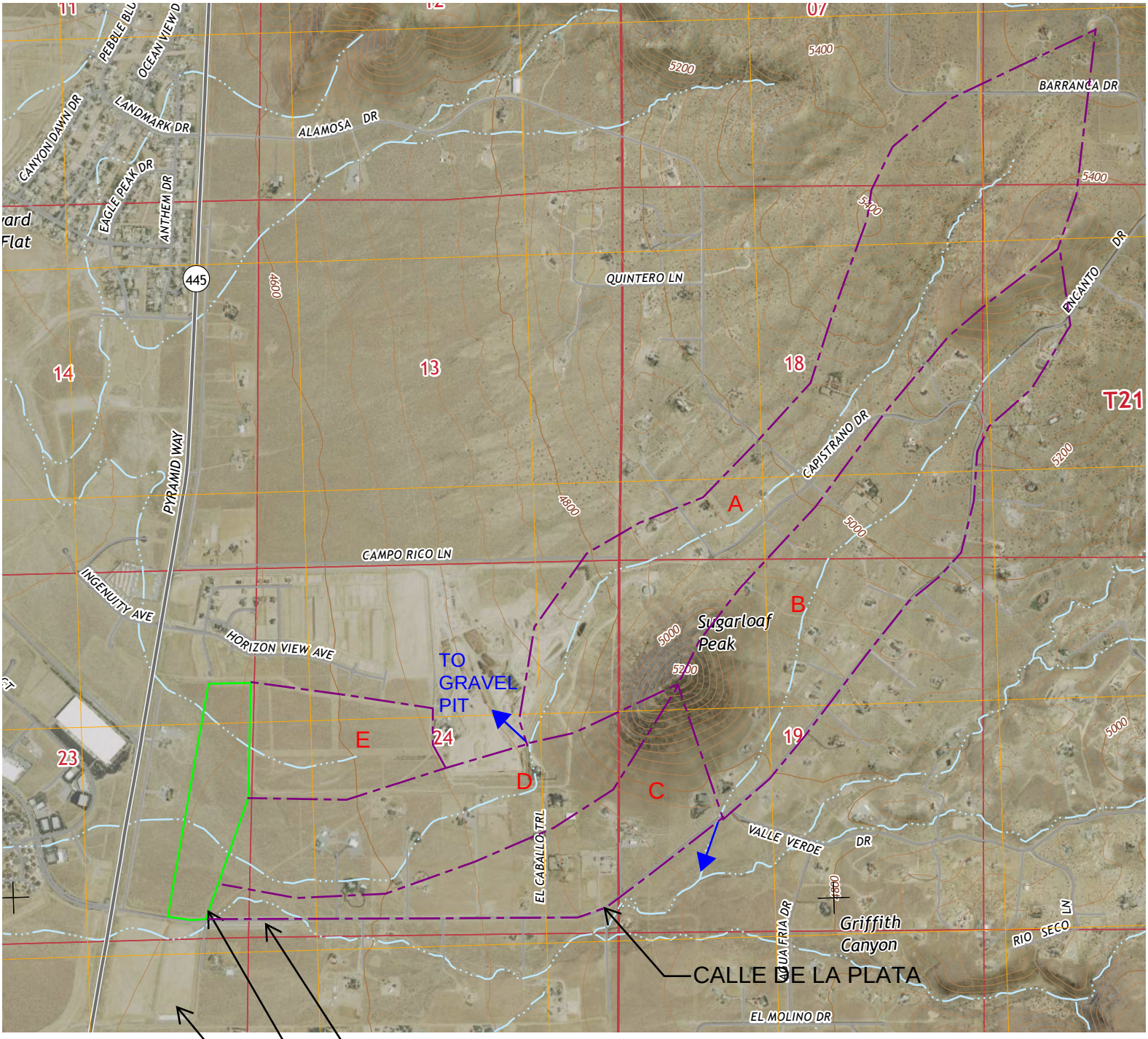
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Subbasin-E	0.13	0.0	01Jan2017, 00:00	0.0
Subbasin-D	0.27	0.5	01Jan2017, 13:43	0.3
Subbasin-C	0.27	1.3	01Jan2017, 14:18	0.7

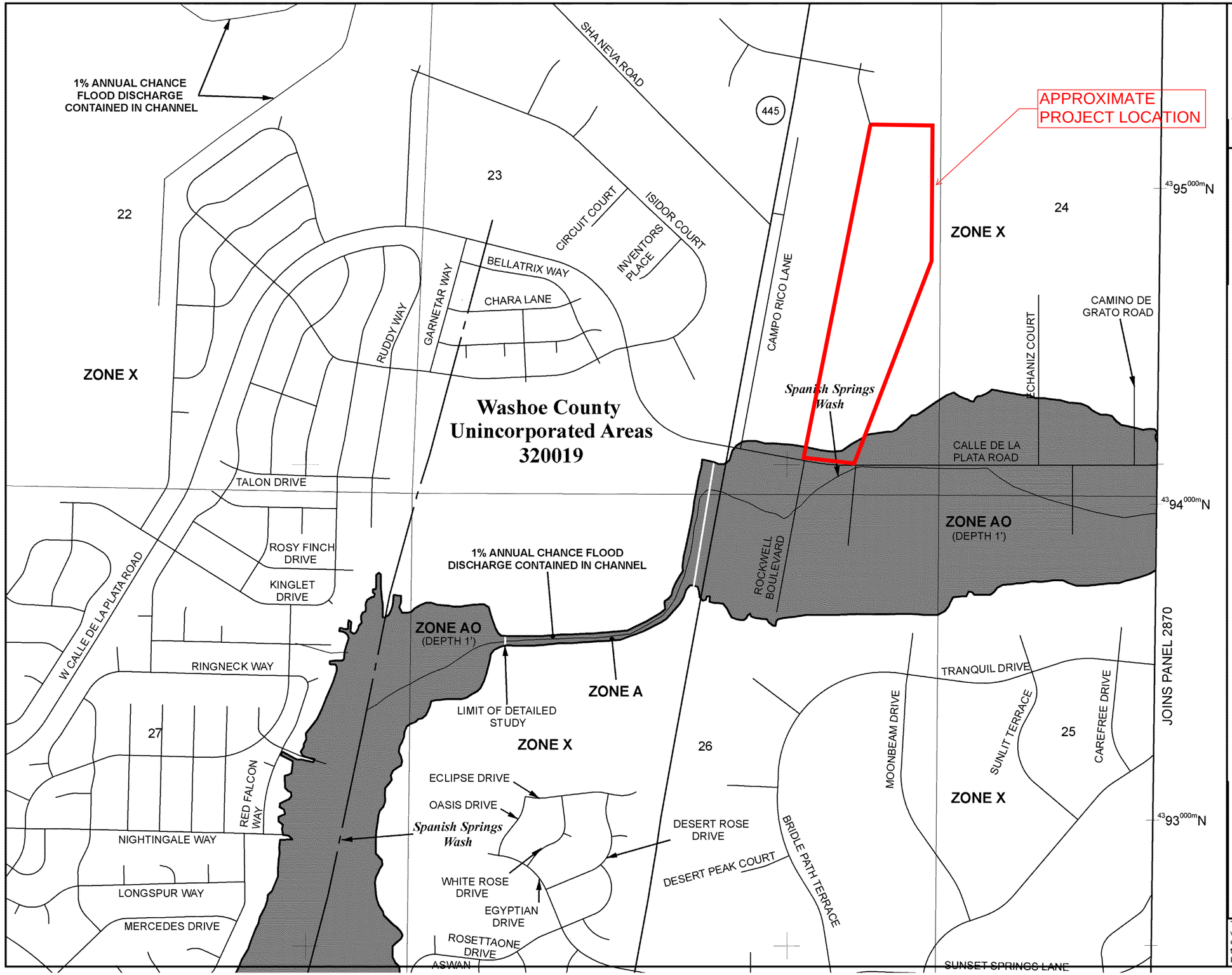
Project: Blackstone Estates Simulation Run: 100-year, 24-hour

Start of Run: 01Jan2017, 00:00
End of Run: 02Jan2017, 00:00
Compute Time: 01Jun2016, 14:27:06

Basin Model: Blackstone Estates
Meteorologic Model: 100-Year
Control Specifications: 100-year, 24-hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Subbasin-E	0.13	1.3	01Jan2017, 19:09	1.0
Subbasin-D	0.27	2.9	01Jan2017, 19:29	2.4
Subbasin-C	0.27	3.3	01Jan2017, 14:30	3.1


PEBBLE BLU
OCEAN VIEW D
CANYON DAWN DR
LANDMARK DR
ALAMOSA DR
BARRANCA DR
EAGLE PEAK DR
ANTHEM DR
445
QUINTERO LN
ENCANTO DR
PYRAMID WAY
CAPISTRANO DR
CAMPO RICO LN
INGENUITY AVE
HORIZON VIEW AVE
Sugarloaf Peak
TO GRAVEL PIT
VALLE VERDE DR
EL CABALLO TRL
AGUA FRIA DR
Griffith Canyon
RIO SECO LN
EL MOLINO DR
CALLE DE LA PLATA
DRAINAGE CHANNEL
APPROXIMATE PROJECT SITE
SEDIMENTATION BASIN
A
B
C
D
E
11
12
07
13
14
18
19
23
24
T21
5400
5200
5000
4800
4600



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2865G

FIRM

FLOOD INSURANCE RATE MAP

WASHOE COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2865 OF 3475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SPARKS, CITY OF	320021	2865	G
WASHOE COUNTY	320019	2865	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 32031C2865G

MAP REVISED MARCH 16, 2009

Federal Emergency Management Agency

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Washoe County Nevada (Unincorporated Areas)	NO PROJECT	UPDATED INFORMATION
	COMMUNITY NO.: 320019		
IDENTIFIER	North Spanish Springs Detention Basin	APPROXIMATE LATITUDE & LONGITUDE: 39.666, -119.700 SOURCE: USGS QUADRANGLE DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 32031C2865 G DATE: March 16, 2009	NO REVISION TO THE FLOOD INSURANCE STUDY REPORT

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Spanish Springs Wash - from approximately 500 feet upstream of Rockwell Boulevard to just upstream

SUMMARY OF REVISIONS

This Letter of Map Revision (LOMR) is an update of a LOMR issued on March 18, 2009 (Case No. 09-09-0489P), which added a Special Flood Hazard Area (SFHA), an area subject to inundation by the base (1-percent-annual-chance) flood, along the revised reach of Spanish Springs Wash. In the March 18 LOMR, the new SFHA was inadvertently misrepresented north of Calle de la Plata Road from approximately 500 feet upstream to just upstream of Rockwell Boulevard. This LOMR revises a portion of the March 18 LOMR to redelineate the SFHA based on updated digital mapping data. As a result, the SFHA is removed north of Calle de la Plata Road from approximately 500 feet upstream to just upstream of Rockwell Boulevard along Spanish Springs Wash.

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Dahlia Kasperski

Dahlia Kasperski, P.E., CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Dahlia Kasperski

Dahlia Kasperski, P.E., CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Sally M. Ziolkowski
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7175

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Dahlia Kasperski

Dahlia Kasperski, P.E., CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Dahlia Kasperski

Dahlia Kasperski, P.E., CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

Legend

1% annual chance (100-Year) Floodplain

1% annual chance (100-Year) Floodway

0.2% annual chance (500-Year) Floodplain

MAP SCALE 1" = 1000'

500 0 1000 FEET

300 0 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2865G

FIRM

FLOOD INSURANCE RATE MAP

WASHOE COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2865 OF 3475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WASHOE COUNTY	320019	2865	G
SPARKS, CITY OF	320021	2865	G

REVISED TO REFLECT LOMR EFFECTIVE: May 29, 2009

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 32031C2865G

MAP REVISED MARCH 16, 2009

Federal Emergency Management Agency

Washoe County Unincorporated Areas 320019

APPROXIMATE PROJECT LOCATION

AREA REVISED BY LOMR DATED MARCH 18, 2009

ZONE X

24

REVISED AREA

CAMPO RICO LN

CT

CAMINO DE GRATO RD

ECHANIZ

ZONE A

ZONE AO (DEPTH 1')

CALLE DE LA PLATA RD

ROCKWELL BLVD

ZONE A

Spanish Springs Wash

ZONE X

1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CHANNEL

TRANQUIL DRIVE

DR

DR

MOONBEAM

SUNLIT TERRACE

CAREFREE

25

AREA REVISED BY LOMR DATED MARCH 18, 2009

BRIDLE PATH TERRACE

DESERT PEAK CT

ZONE X

JOINS PANEL 2870

NOAA Atlas 14, Volume 1, Version 5
Location name: Sparks, Nevada, US*
Latitude: 39.6670°, Longitude: -119.6967°
Elevation: 4567 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.099** (0.083-0.114)	**0.123** (0.103-0.144)	**0.166** (0.140-0.196)	**0.206** (0.173-0.245)	**0.274** (0.225-0.331)	**0.338** (0.270-0.415)	**0.415** (0.322-0.517)	**0.510** (0.380-0.649)	**0.664** (0.469-0.874)	**0.807** (0.546-1.09)
10-min	**0.151** (0.126-0.174)	**0.187** (0.157-0.219)	**0.252** (0.212-0.298)	**0.313** (0.263-0.373)	**0.417** (0.343-0.504)	**0.515** (0.411-0.631)	**0.632** (0.490-0.787)	**0.776** (0.579-0.988)	**1.01** (0.713-1.33)	**1.23** (0.830-1.66)
15-min	**0.187** (0.156-0.215)	**0.233** (0.194-0.272)	**0.312** (0.263-0.369)	**0.389** (0.326-0.462)	**0.517** (0.425-0.625)	**0.638** (0.510-0.782)	**0.784** (0.608-0.975)	**0.962** (0.717-1.22)	**1.25** (0.884-1.65)	**1.52** (1.03-2.05)
30-min	**0.251** (0.210-0.290)	**0.313** (0.262-0.366)	**0.420** (0.354-0.497)	**0.523** (0.440-0.622)	**0.696** (0.573-0.842)	**0.859** (0.687-1.05)	**1.06** (0.819-1.31)	**1.29** (0.966-1.65)	**1.69** (1.19-2.22)	**2.05** (1.39-2.77)
60-min	**0.311** (0.260-0.359)	**0.387** (0.324-0.453)	**0.520** (0.438-0.615)	**0.648** (0.544-0.770)	**0.862** (0.709-1.04)	**1.06** (0.850-1.30)	**1.31** (1.01-1.63)	**1.60** (1.20-2.04)	**2.09** (1.47-2.75)	**2.54** (1.72-3.42)
2-hr	**0.411** (0.361-0.475)	**0.511** (0.450-0.593)	**0.658** (0.574-0.765)	**0.788** (0.677-0.914)	**0.988** (0.829-1.16)	**1.17** (0.958-1.38)	**1.38** (1.10-1.66)	**1.67** (1.29-2.06)	**2.17** (1.61-2.78)	**2.64** (1.89-3.46)
3-hr	**0.494** (0.438-0.563)	**0.614** (0.550-0.704)	**0.772** (0.685-0.882)	**0.901** (0.793-1.03)	**1.09** (0.940-1.25)	**1.25** (1.06-1.45)	**1.45** (1.21-1.71)	**1.73** (1.41-2.07)	**2.22** (1.76-2.81)	**2.68** (2.07-3.49)
6-hr	**0.699** (0.624-0.790)	**0.874** (0.780-0.991)	**1.08** (0.962-1.23)	**1.25** (1.10-1.42)	**1.46** (1.27-1.67)	**1.62** (1.39-1.86)	**1.78** (1.51-2.07)	**1.99** (1.67-2.35)	**2.40** (1.97-2.87)	**2.81** (2.27-3.53)
12-hr	**0.930** (0.829-1.04)	**1.17** (1.04-1.31)	**1.47** (1.31-1.66)	**1.71** (1.51-1.93)	**2.03** (1.77-2.31)	**2.27** (1.97-2.60)	**2.52** (2.15-2.92)	**2.77** (2.33-3.25)	**3.11** (2.54-3.71)	**3.41** (2.73-4.13)
24-hr	**1.16** (1.04-1.31)	**1.47** (1.31-1.65)	**1.89** (1.68-2.12)	**2.23** (1.98-2.51)	**2.70** (2.38-3.05)	**3.09** (2.69-3.49)	**3.49** (3.01-3.98)	**3.91** (3.33-4.49)	**4.49** (3.76-5.22)	**4.96** (4.08-5.83)
2-day	**1.40** (1.24-1.59)	**1.77** (1.57-2.01)	**2.31** (2.04-2.62)	**2.74** (2.41-3.12)	**3.37** (2.92-3.85)	**3.87** (3.33-4.45)	**4.40** (3.74-5.10)	**4.97** (4.16-5.81)	**5.77** (4.73-6.84)	**6.42** (5.16-7.72)
3-day	**1.52** (1.35-1.73)	**1.94** (1.72-2.21)	**2.56** (2.25-2.91)	**3.06** (2.68-3.49)	**3.79** (3.28-4.33)	**4.38** (3.75-5.04)	**5.01** (4.24-5.81)	**5.69** (4.74-6.66)	**6.66** (5.42-7.91)	**7.45** (5.95-8.97)
4-day	**1.65** (1.46-1.88)	**2.11** (1.86-2.40)	**2.81** (2.47-3.20)	**3.38** (2.96-3.86)	**4.21** (3.65-4.83)	**4.88** (4.18-5.63)	**5.62** (4.74-6.53)	**6.41** (5.32-7.50)	**7.54** (6.11-8.98)	**8.47** (6.74-10.2)
7-day	**1.94** (1.70-2.24)	**2.49** (2.17-2.87)	**3.34** (2.91-3.85)	**4.04** (3.50-4.67)	**5.04** (4.31-5.85)	**5.86** (4.96-6.85)	**6.75** (5.64-7.95)	**7.70** (6.33-9.15)	**9.07** (7.29-10.9)	**10.2** (8.05-12.5)
10-day	**2.19** (1.91-2.52)	**2.82** (2.46-3.25)	**3.79** (3.29-4.37)	**4.56** (3.95-5.27)	**5.65** (4.84-6.57)	**6.54** (5.55-7.63)	**7.48** (6.27-8.79)	**8.47** (7.00-10.1)	**9.87** (7.99-11.9)	**11.0** (8.76-13.4)
20-day	**2.72** (2.38-3.13)	**3.51** (3.07-4.04)	**4.70** (4.11-5.41)	**5.62** (4.89-6.46)	**6.85** (5.92-7.89)	**7.81** (6.69-9.03)	**8.79** (7.45-10.2)	**9.86** (8.26-11.6)	**11.3** (9.31-13.5)	**12.5** (10.1-15.1)
30-day	**3.19** (2.79-3.68)	**4.12** (3.60-4.75)	**5.51** (4.81-6.36)	**6.58** (5.71-7.57)	**8.00** (6.90-9.22)	**9.09** (7.79-10.5)	**10.2** (8.68-11.9)	**11.4** (9.54-13.3)	**13.0** (10.8-15.5)	**14.4** (11.7-17.2)
45-day	**3.82** (3.34-4.34)	**4.94** (4.32-5.61)	**6.58** (5.74-7.47)	**7.80** (6.79-8.86)	**9.41** (8.14-10.7)	**10.6** (9.14-12.2)	**11.9** (10.1-13.6)	**13.1** (11.1-15.2)	**15.0** (12.4-17.5)	**16.4** (13.5-19.3)
60-day	**4.39** (3.82-5.00)	**5.71** (4.98-6.49)	**7.59** (6.61-8.63)	**8.93** (7.76-10.1)	**10.6** (9.19-12.1)	**11.9** (10.2-13.6)	**13.1** (11.2-15.0)	**14.3** (12.1-16.5)	**15.9** (13.4-18.6)	**17.2** (14.3-20.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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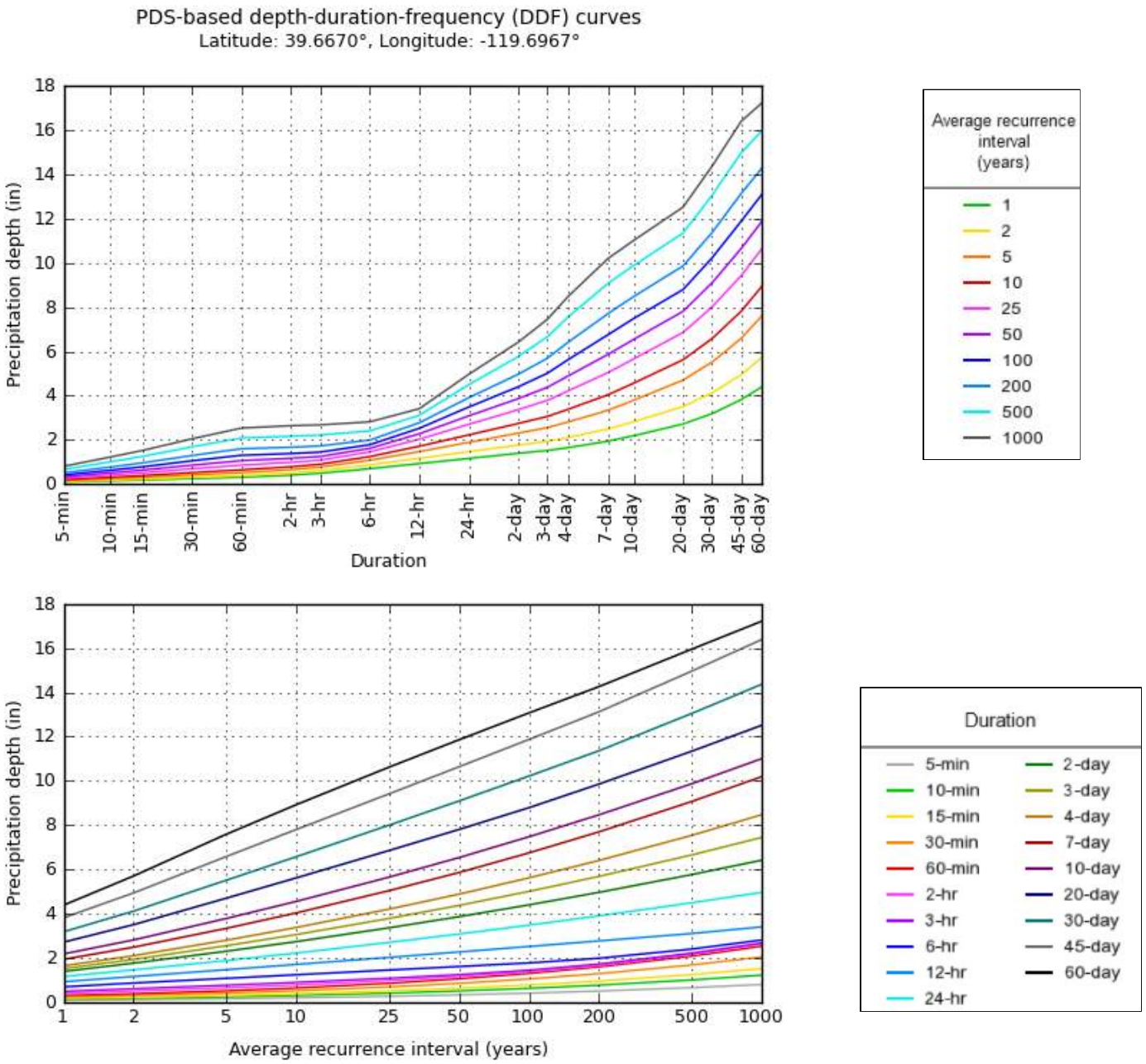
PF graphical



NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Wed Jun 1 16:34:40 2016

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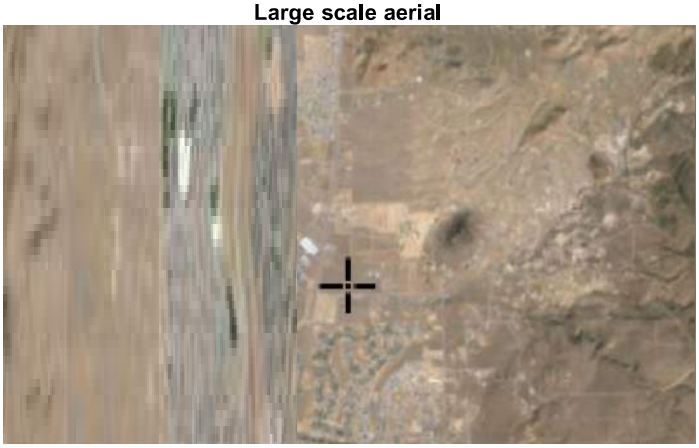
Maps & aerials

Small scale terrain

Large scale terrain

Large scale map

Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 1, Version 5
Location name: Sparks, Nevada, US*
Latitude: 39.6670°, Longitude: -119.6967°
Elevation: 4567 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**1.19** (0.996-1.37)	**1.48** (1.24-1.73)	**1.99** (1.68-2.35)	**2.47** (2.08-2.94)	**3.29** (2.70-3.97)	**4.06** (3.24-4.98)	**4.98** (3.86-6.20)	**6.12** (4.56-7.79)	**7.97** (5.63-10.5)	**9.68** (6.55-13.1)
10-min	**0.906** (0.756-1.04)	**1.12** (0.942-1.31)	**1.51** (1.27-1.79)	**1.88** (1.58-2.24)	**2.50** (2.06-3.02)	**3.09** (2.47-3.79)	**3.79** (2.94-4.72)	**4.66** (3.47-5.93)	**6.06** (4.28-7.99)	**7.37** (4.98-9.94)
15-min	**0.748** (0.624-0.860)	**0.932** (0.776-1.09)	**1.25** (1.05-1.48)	**1.56** (1.30-1.85)	**2.07** (1.70-2.50)	**2.55** (2.04-3.13)	**3.14** (2.43-3.90)	**3.85** (2.87-4.90)	**5.01** (3.54-6.60)	**6.09** (4.12-8.22)
30-min	**0.502** (0.420-0.580)	**0.626** (0.524-0.732)	**0.840** (0.708-0.994)	**1.05** (0.880-1.24)	**1.39** (1.15-1.68)	**1.72** (1.37-2.11)	**2.11** (1.64-2.63)	**2.59** (1.93-3.30)	**3.37** (2.38-4.44)	**4.10** (2.77-5.53)
60-min	**0.311** (0.260-0.359)	**0.387** (0.324-0.453)	**0.520** (0.438-0.615)	**0.648** (0.544-0.770)	**0.862** (0.709-1.04)	**1.06** (0.850-1.30)	**1.31** (1.01-1.63)	**1.60** (1.20-2.04)	**2.09** (1.47-2.75)	**2.54** (1.72-3.42)
2-hr	**0.206** (0.180-0.238)	**0.256** (0.225-0.296)	**0.329** (0.287-0.382)	**0.394** (0.338-0.457)	**0.494** (0.414-0.578)	**0.584** (0.479-0.691)	**0.692** (0.552-0.828)	**0.834** (0.645-1.03)	**1.08** (0.804-1.39)	**1.32** (0.946-1.73)
3-hr	**0.165** (0.146-0.187)	**0.204** (0.183-0.234)	**0.257** (0.228-0.294)	**0.300** (0.264-0.344)	**0.362** (0.313-0.416)	**0.416** (0.354-0.484)	**0.483** (0.403-0.568)	**0.576** (0.470-0.689)	**0.739** (0.585-0.934)	**0.892** (0.689-1.16)
6-hr	**0.117** (0.104-0.132)	**0.146** (0.130-0.165)	**0.181** (0.161-0.206)	**0.208** (0.184-0.236)	**0.244** (0.213-0.278)	**0.270** (0.233-0.311)	**0.297** (0.253-0.346)	**0.332** (0.278-0.392)	**0.402** (0.329-0.480)	**0.470** (0.379-0.589)
12-hr	**0.077** (0.069-0.087)	**0.097** (0.086-0.109)	**0.122** (0.109-0.138)	**0.142** (0.126-0.160)	**0.168** (0.147-0.191)	**0.189** (0.163-0.216)	**0.209** (0.179-0.242)	**0.230** (0.193-0.270)	**0.258** (0.211-0.308)	**0.283** (0.227-0.343)
24-hr	**0.048** (0.043-0.055)	**0.061** (0.055-0.069)	**0.079** (0.070-0.088)	**0.093** (0.082-0.104)	**0.113** (0.099-0.127)	**0.129** (0.112-0.146)	**0.145** (0.125-0.166)	**0.163** (0.139-0.187)	**0.187** (0.157-0.217)	**0.207** (0.170-0.243)
2-day	**0.029** (0.026-0.033)	**0.037** (0.033-0.042)	**0.048** (0.042-0.055)	**0.057** (0.050-0.065)	**0.070** (0.061-0.080)	**0.081** (0.069-0.093)	**0.092** (0.078-0.106)	**0.103** (0.087-0.121)	**0.120** (0.098-0.143)	**0.134** (0.108-0.161)
3-day	**0.021** (0.019-0.024)	**0.027** (0.024-0.031)	**0.036** (0.031-0.040)	**0.043** (0.037-0.048)	**0.053** (0.046-0.060)	**0.061** (0.052-0.070)	**0.070** (0.059-0.081)	**0.079** (0.066-0.092)	**0.092** (0.075-0.110)	**0.103** (0.083-0.125)
4-day	**0.017** (0.015-0.020)	**0.022** (0.019-0.025)	**0.029** (0.026-0.033)	**0.035** (0.031-0.040)	**0.044** (0.038-0.050)	**0.051** (0.044-0.059)	**0.059** (0.049-0.068)	**0.067** (0.055-0.078)	**0.079** (0.064-0.094)	**0.088** (0.070-0.106)
7-day	**0.012** (0.010-0.013)	**0.015** (0.013-0.017)	**0.020** (0.017-0.023)	**0.024** (0.021-0.028)	**0.030** (0.026-0.035)	**0.035** (0.029-0.041)	**0.040** (0.034-0.047)	**0.046** (0.038-0.054)	**0.054** (0.043-0.065)	**0.061** (0.048-0.074)
10-day	**0.009** (0.008-0.011)	**0.012** (0.010-0.014)	**0.016** (0.014-0.018)	**0.019** (0.016-0.022)	**0.024** (0.020-0.027)	**0.027** (0.023-0.032)	**0.031** (0.026-0.037)	**0.035** (0.029-0.042)	**0.041** (0.033-0.050)	**0.046** (0.036-0.056)
20-day	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.010** (0.009-0.011)	**0.012** (0.010-0.013)	**0.014** (0.012-0.016)	**0.016** (0.014-0.019)	**0.018** (0.016-0.021)	**0.021** (0.017-0.024)	**0.024** (0.019-0.028)	**0.026** (0.021-0.031)
30-day	**0.004** (0.004-0.005)	**0.006** (0.005-0.007)	**0.008** (0.007-0.009)	**0.009** (0.008-0.011)	**0.011** (0.010-0.013)	**0.013** (0.011-0.015)	**0.014** (0.012-0.017)	**0.016** (0.013-0.019)	**0.018** (0.015-0.022)	**0.020** (0.016-0.024)
45-day	**0.004** (0.003-0.004)	**0.005** (0.004-0.005)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.009** (0.008-0.010)	**0.010** (0.008-0.011)	**0.011** (0.009-0.013)	**0.012** (0.010-0.014)	**0.014** (0.012-0.016)	**0.015** (0.012-0.018)
60-day	**0.003** (0.003-0.003)	**0.004** (0.003-0.005)	**0.005** (0.005-0.006)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.010** (0.008-0.011)	**0.011** (0.009-0.013)	**0.012** (0.010-0.014)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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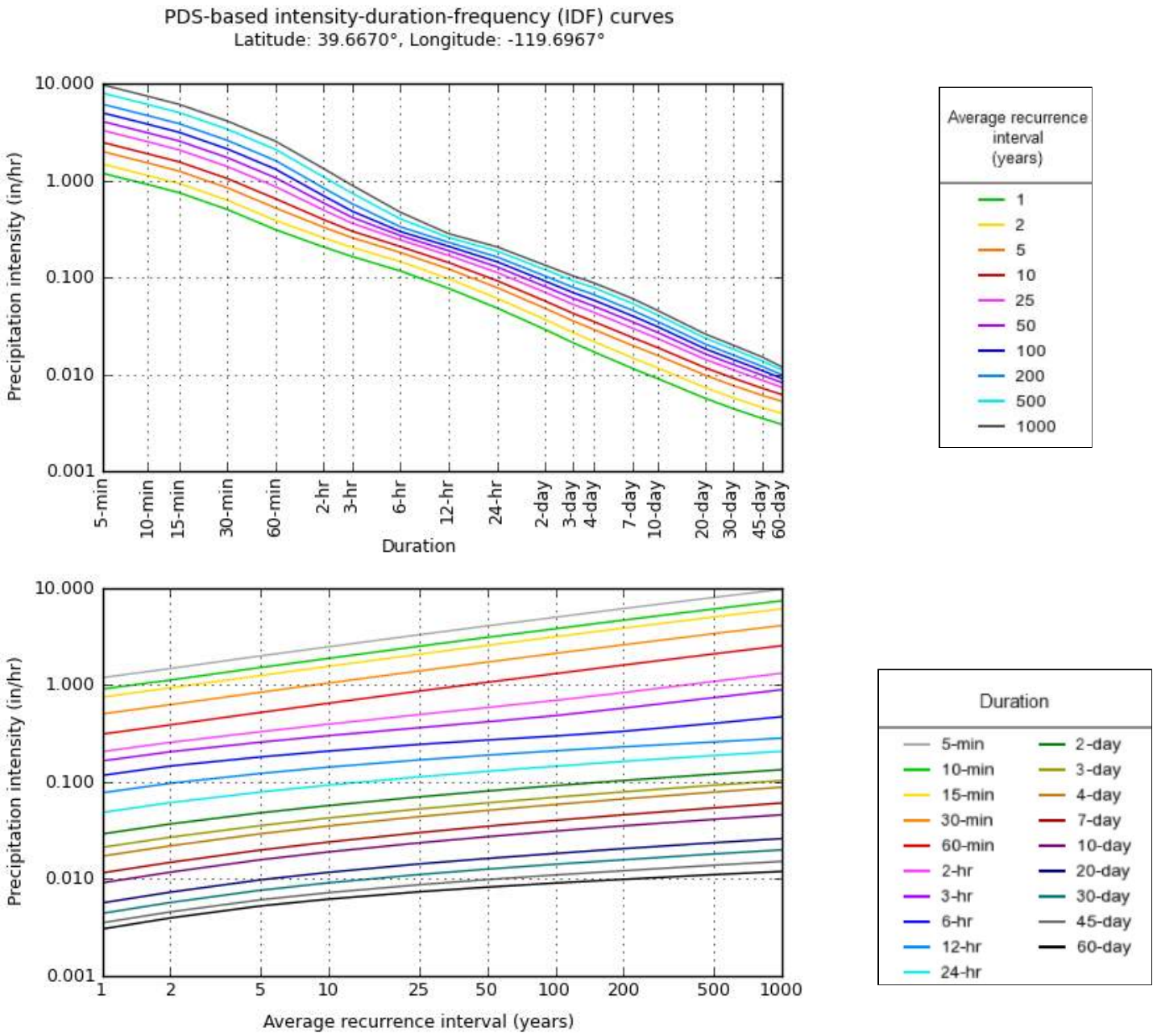
PF graphical



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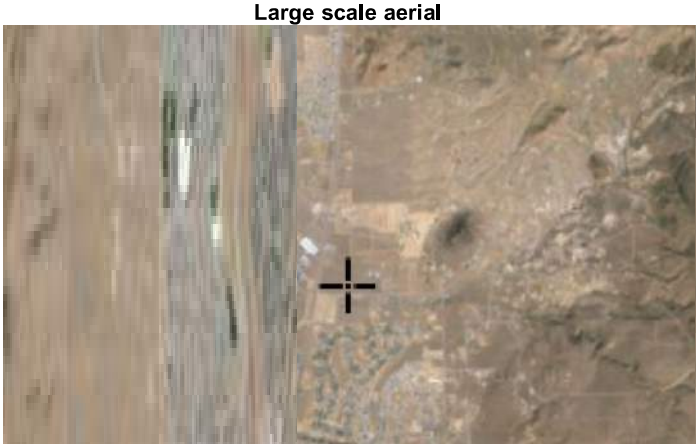
Maps & aerials

Small scale terrain

Large scale terrain

Large scale map

Large scale aerial



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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Washoe County, Nevada, South Part

June 1, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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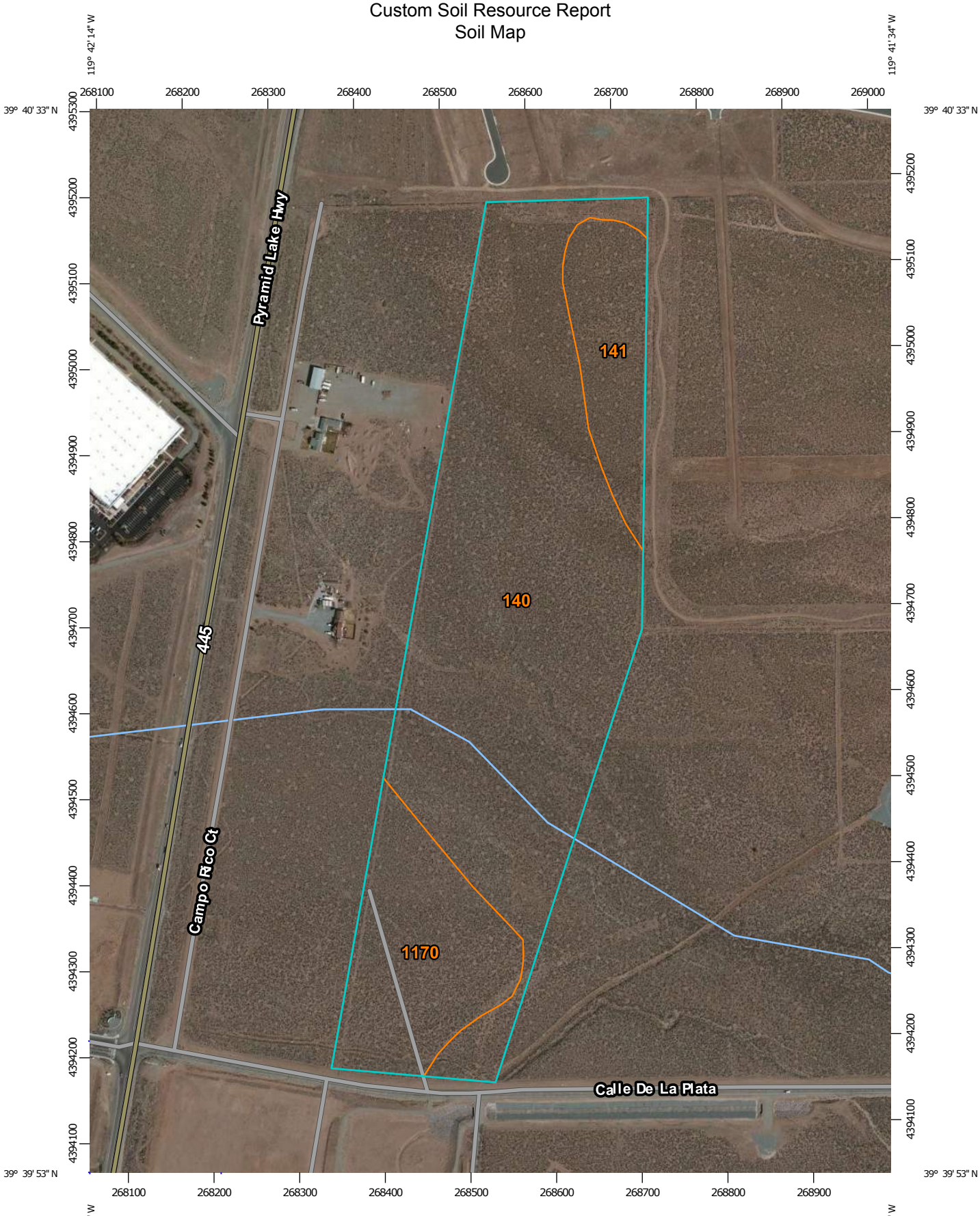
Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:6,030 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washoe County, Nevada, South Part
Survey Area Data: Version 11, Aug 21, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 2, 2012—Apr 29, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Washoe County, Nevada, South Part (NV628)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
140	Haybourne loamy sand, 2 to 4 percent slopes	41.2	70.6%
141	Haybourne loamy sand, 4 to 8 percent slopes	6.3	10.8%
1170	Wedertz sandy loam, 2 to 4 percent slopes	10.9	18.7%
Totals for Area of Interest		**58.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments

on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Washoe County, Nevada, South Part

140—Haybourne loamy sand, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: hxfn
Elevation: 4,500 to 5,900 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 48 to 51 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Haybourne and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haybourne

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granitic rocks

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 26 inches: sandy loam
H3 - 26 to 63 inches: stratified gravelly coarse sand to fine sandy loam

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: SANDY 8-10 P.Z. (R026XY020NV)

Minor Components

Incy

Percent of map unit: 5 percent
Landform: Dunes
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SANDY 8-10 P.Z. (R026XY020NV)

Greenbrae

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: LOAMY 8-10 P.Z. (R026XY016NV)

Indian creek

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: CLAYPAN 8-10 P.Z. (R026XY025NV)

141—Haybourne loamy sand, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: hxfr
Elevation: 4,500 to 5,900 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 48 to 51 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Haybourne and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haybourne

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granitic rocks

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 26 inches: sandy loam
H3 - 26 to 60 inches: stratified gravelly coarse sand to fine sandy loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare

Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: SANDY 8-10 P.Z. (R026XY020NV)

Minor Components

Incy

Percent of map unit: 5 percent
Landform: Dunes
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SANDY 8-10 P.Z. (R026XY020NV)

Linhart

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: GRANITIC FAN 10-12 P.Z. (R026XY008NV)

Indian creek

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: CLAYPAN 8-10 P.Z. (R026XY025NV)

1170—Wedertz sandy loam, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: hxcv
Elevation: 4,500 to 5,500 feet
Mean annual precipitation: 8 to 10 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 100 to 110 days
Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium

Map Unit Composition

Wedertz and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wedertz

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 22 inches: sandy clay loam
H3 - 22 to 34 inches: sandy loam
H4 - 34 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C
Ecological site: LOAMY 8-10 P.Z. (R026XY016NV)

Minor Components

Jowec

Percent of map unit: 5 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Convex

Aquinas

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: LOAMY HILL 10-12 P.Z. (R026XY017NV)

Greenbrae

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: LOAMY 8-10 P.Z. (R026XY016NV)

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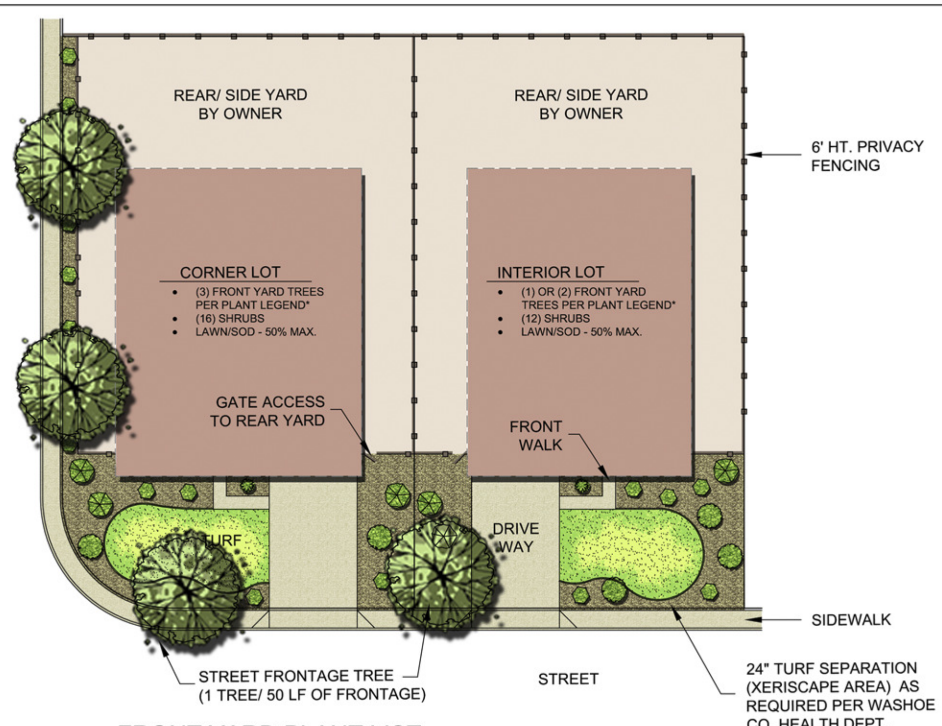


FRONT YARD PLANT LIST

SYM.	DESCRIPTION		
	FRONT YARD TREES*		SHRUBS
			TURF

MULCH NOTE: ALL SHRUB BEDS SHALL RECEIVE 3" DEPTH OF MULCH WITH WEED CONTROL

*OVERALL FRONT YARD / STREET FRONTAGE TREE QUANTITY SHALL MEET THE MINIMUM CODE REQUIREMENT OF ONE (1) TREE PER 50 LF OF STREET FRONTAGE.

TYPICAL FRONT YARD PLAN

LANDSCAPE DATA

PROJECT SITE AREA: 58 ACRES
ZONING: LDS (LOW DENSITY SUBURBAN & GR (GENERAL RURAL)

TREES REQUIRED PER WASHOE COUNTY CODE

- All required front, rear or side yards which adjoin a public street shall be landscaped and shall include at least one (1) tree for every fifty (50) linear feet of street frontage, or fraction thereof.
- Subdivision Perimeters - New residential subdivisions, regardless of the number of dwelling units per pacel, shall provide at least one (1) tree for every fifty (50) linear feet of perimeter frontage adjoining an arterial or collector identified in the Washoe County Comprehensive Plan Streets and Highways System Plan map.

GENERAL NOTES

1) ALL PLANTING AND IRRIGATION SHALL BE INSTALLED PER LOCAL GOVERNING CODES.

2) FINAL PLANT SELECTION AND LAYOUT WILL BE BASED ON SOUND HORTICULTURAL PRACTICES RELATING TO MICRO-CLIMATE, SOIL, AND WATER REGIMES. ALL TREES WILL BE STAKED SO AS TO REMAIN UPRIGHT AND PLUMB FOLLOWING INSTALLATION. PLANT SIZE AND QUALITY AT TIME OF PLANTING WILL BE PER THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1).

3) ALL SHRUB BEDS WILL RECEIVE 3" DEPTH MULCH WITH WEED CONTROL.

4) ALL LANDSCAPING WILL BE AUTOMATICALLY IRRIGATED. CONTAINER PLANTINGS WILL BE DRIP IRRIGATED BASED ON THE SPECIFIC HORTICULTURAL REQUIREMENTS OF EACH SPECIES. A REDUCED-PRESSURE-TYPE BACKFLOW PREVENTOR WILL BE PROVIDED ON THE COMMON AREA IRRIGATION SYSTEM AS REQUIRED PER CODE.

PLANT LEGEND

- FRONT YARD/STREET FRONTAGE TREE
- FLOWERING DECIDUOUS TREE
- DECIDUOUS TREE
- EVERGREEN TREE

TREE REQUIREMENTS

- Use a mix of informally placed deciduous and evergreen trees for visual interest.
- At least one-half of the deciduous trees shall be two (2) inch caliper minimum.The remaining deciduous trees may be one (1) inch caliper at the time of planting.
- At least one-half of all evergreen trees shall be at least seven (7) feet in height, and the remainder must be at least five (5) feet in height at the time of planting.

- SHRUBS
- NATIVE LANDSCAPE/ REVEGETATION AREA

0' 120' 240' 360'
Scale in Feet

L.A. StudioNevada
the landscape architecture studio
1552 C Street Sparks, NV 89431 (775) 323-2223 NV RLA #440
www.lastudionevada.com

NEVADA

PRELIMINARY LANDSCAPE PLAN
BLACKSTONE ESTATES
Rubicon Design Group

WASHOE COUNTY

No.	Revision Date

LA No:	587-501-10-15
Designed:	JWH
Drawn:	JWH
Checked:	RWH
CAD File:	587-501-10-15
Date:	6/15/16

Sheet
L1
of
1

2 working days Call before you Dig. 1-800-227-2600
AVOID CUTTING UNDERGROUND UTILITIES

SP58, LLC.
BLACKSTONE ESTATES
TENTATIVE MAP
APN: 534-571-01

GENERAL NOTES:

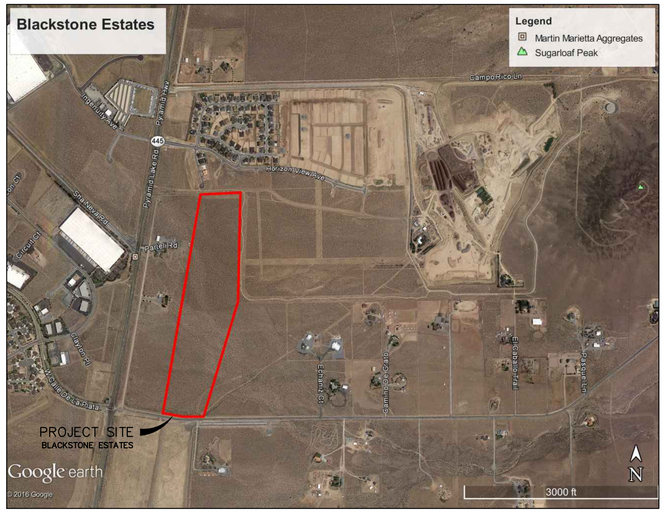
1. PARCEL NUMBER: 534-571-01
2. PROJECT ADDRESS: 250 CALLE DE LA PLATA
3. LOCATED WITHIN THE SPANISH SPRINGS PLANNED AREA OF WASHOE COUNTY
4. EXISTING ZONING IS NEIGHBORHOOD COMMERCIAL/OFFICE (NC), INDUSTRIAL (I) AND SUBURBAN. PROPOSED ZONING IS MDS WITH CLUSTER OPEN SPACE OPTION.
5. NO BUILDINGS EXIST ON THE SUBJECT PROPERTY.
6. NO SEPTIC SYSTEMS, WELLS, LEACH FIELDS OR OVERHEAD UTILITIES EXIST OR ARE PROPOSED ON THE SUBJECT PROPERTY.
7. PROMINENT LANDMARKS, AREAS OF UNIQUE NATURAL BEAUTY, ROCK OUTCROPPINGS, VISTAS AND NATURAL FOLIAGE ARE NOT PRESENT ON THE SUBJECT PROPERTY.
8. CUTS AND FILLS OF GREATER THAN 5' IN HEIGHT ARE NOT PROPOSED FOR THE SUBJECT PROPERTY.
9. NO WETLANDS OR SPRINGS ARE KNOWN TO EXIST ON THE SUBJECT PROPERTY.
10. SECONDARY EMERGENCY ACCESS IS PROPOSED THROUGH THE ADJACENT SUBDIVISION TO THE EAST.
11. LANDSCAPING REQUIRED PER SECTION 110.412 OF THE WASHOE COUNTY DEVELOPMENT CODE.
12. LIGHTING SHALL BE IN CONFORMANCE WITH SECTION 110.414 OF THE WASHOE COUNTY DEVELOPMENT CODE. SPECIFICALLY, PER SECTION 110.414.21 COVERS MUST BE INSTALLED ON ALL LIGHTING FIXTURES AND LAMPS MUST NOT EXTEND BELOW THE BOTTOM OF THE COVER.
13. THE DESIGN AND POSTED SPEED FOR THIS SUBDIVISION IS 25 MPH.
14. ALL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM WITH THE MOST RECENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION AND WASHOE COUNTY STANDARDS.
15. THE MINIMUM PAVEMENT STRUCTURAL SECTION SHALL BE TWO AND ONE-HALF (2.5) INCHES OF TYPE 2 OR TYPE 3 ASPHALT CONCRETE PAVEMENT COMPACTED TO NINETY-FIVE (95) PERCENT MINIMUM DENSITY OVER AN ENGINEERED SUBGRADE. DRAINAGE SHALL BE CONSISTENT WITH COUNTY STANDARDS, INCLUDING ARTIC LE 420, STORM DRAINAGE STANDARDS. THE PAVEMENT SHALL BE SEALED IN ACCORDANCE WITH WASHOE COUNTY STANDARDS.

BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS PLAT IS BASED ON THE NEVADA COORDINATE SYSTEM OF 1983, WEST ZONE, NAD 86/94. DISTANCES SHOWN ARE GROUND DISTANCES USINGA PROJECT COMBINED GRID TO GROUND SCALE FACTOR OF 1.0001998699

BASIS OF ELEVATIONS: DATUM: NAVD 88
PROJECT BENCHMARK: LUMOS CONTROL POINT 500 HAVING AN ELEVATION OF 4550.27'

TOPOGRAPHY DERIVED FROM AERIAL PHOTOGRAMMETRY, DATE OF FLIGHT 07/23/2015

LOCATION MAP



VICINITY MAP

LAND USE DATA:

1. NUMBER OF LOTS: 161 LOTS
2. TOTAL AREA: 58.5 ACRES
3. COMMON AREA: 9.27
   16% COMMON OPEN SPACE PROPOSED
4. DENSITY/INTENSITY: 3 DWELLING UNITS PER ACRE PERMITTED
   2.75 DWELLING UNITS PER ACRE PROPOSED
5. HEIGHT: 35' MAXIMUM PERMITTED/PROPOSED HEIGHT
6. LOT SIZE: 12,000 SF MINIMUM LOT SIZE PERMITTED (MDS ZONING) *
   80' MINIMUM LOT WIDTH PERMITTED (MDS ZONING) *
   * MINIMUM LOT SIZE MODIFIED FOR COMMON OPEN SPACE DEVELOPMENT
7. COMMON OPEN SPACE DEVELOPMENT: THE PROVISIONS OF SECTION 110.404.05, LOT STANDARDS, MAY BE MODIFIED PURSUANT TO ARTICLE 408, COMMON OPEN SPACE DEVELOPMENT. THIS MODIFICATION MAY INCLUDE THE REDUCTION IN MINIMUM LOT SIZES AS LONG AS THE OVERALL DENSITY IS NOT INCREASED BEYOND THAT PERMITTED IN THE REGULATORY ZONE.
8. AVERAGE LOT SIZE: 11,140 SF
9. LARGEST LOT: 19,271 SF (LOT 22)
10. SMALLEST LOT: 8,595 SF (LOT 96)
11. YARD/SETBACKS: FRONT YARD: 20'
    SIDE YARD: 8'
    REAR YARD: 20'
12. THERE SHALL BE NO FENCES OR OTHER OBSTRUCTIONS TO VISION MORE THAN 18" HIGHER THAN CURB LEVEL WITHIN THE SITE VISIBILITY TRIANGLES.
13. ARCHITECTURAL FEATURES: CORNICES, CANOPIES, CHIMNEYS, EAVES OR OTHER SIMILAR ARCHITECTURAL FEATURES MAY EXTEND INTO A REQUIRED SETBACK BY A DISTANCE NOT TO EXCEED TWO (2) FEET.
14. DETACHED GARAGES MAY BE LOCATED BEHIND THE REQUIRED FRONT SETBACK.
15. DECKS WHICH ARE LESS THAN 18" IN HEIGHT FROM THE FINISHED GRADE ARE NOT COUNTED AS A STRUCTURE FOR SETBACK PURPOSES.
16. OFF-STREET PARKING: 2 SPACES REQUIRED PER DWELLING UNIT, 1 OF WHICH MUST BE IN AN ENCLOSED GARAGE.
    4 SPACES PROVIDED PER DWELLING UNIT, 2 OF WHICH IN A GARAGE AND 2 OF WHICH IN THE DRIVEWAY.
17. OPEN SPACE: PRIVATE OPEN SPACE PROPOSED PER SECTION 110.432.10 OF THE WASHOE COUNTY DEVELOPMENT CODE AND COMMON OPEN SPACE PROPOSED PER SECTION 110.432.15 OF THE CODE.
    REQUIRED: 400 SF PRIVATE SPACE PER LOT
    200 SF COMMON OPEN SPACE PER LOT (32,200 SF)
    PROPOSED: 1,400 SF MINIMUM PRIVATE SPACE PER LOT
    403,800 SF (9.27 AC) COMMON OPEN SPACE (COMMON AREAS 'A', 'B', 'C' AND 'D')

OWNER/DEVELOPER:

SP58, LLC.
ATTN: JOSHUA MYERS
439 W PLUMB LANE
RENO, NV 89509
PH.: (775) 352-4200
FAX: (520) 529-1752

ENGINEER

LUMOS & ASSOCIATES
800 E. COLLEGE PARKWAY
CARSON CITY, NEVADA 89706
PH.: (775) 883-7077
FAX: (775) 883-7114

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SP58, LLC.
BLACKSTONE ESTATES
TENTATIVE MAP
TITLE SHEET
WASHOE COUNTY
NEVADA

REV | DATE | DESCRIPTION | BY

TENTATIVE MAP

C1

DATE: MAY 2016
DRAWN BY: KLN/JH
DESIGNED BY: RB
CHECKED BY: TR
JOB NO.: 8973.001

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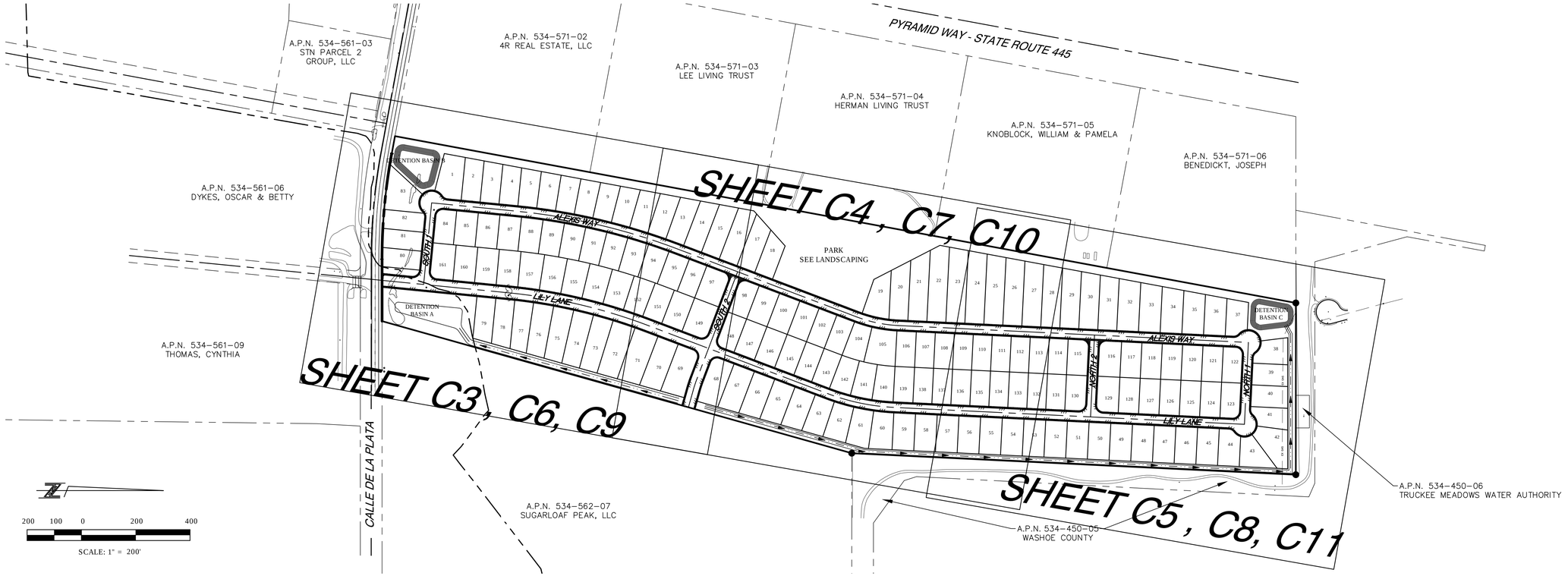

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BLACKSTONE ESTATES
TENTATIVE MAP
INDEX SHEET

WASHOE COUNTY NEVADA

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TENTATIVE MAP

C2

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BLACKSTONE ESTATES
TENTATIVE MAP
SITE PLAN 1

WASHOE COUNTY, NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C3

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A.P.N.534-571-03
LEE LIVING TRUST

A.P.N.534-571-04
HERMAN LIVING TRUST

A.P.N.534-571-05
KNOBLOCK, WILLIAM & PAMELA

N10°29'38.00"E 3373.90'

COMMON AREA 'B'
3.19 AC

PARK
SEE LANDSCAPING

ALEXIS WAY

LILY LANE

SOUTH 2

N20°46'38"E 706.37'

N2°46'04"E 1291.69'

S89°13'52"E 421.80'

S74°18'01"E 65.12'

S15°42'35.00"W 1796.78'

S02°46'04.00"W 1637.31'

A.P.N.534-562-07
SUGARLOAF PEAK, LLC

A.P.N.534-450-05
WASHOE COUNTY

50 25 0 50 100
SCALE: 1" = 50'

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BLACKSTONE ESTATES
TENTATIVE MAP
SITE PLAN 2

WASHOE COUNTY

NEVADA

REV	DATE	DESCRIPTION	BY

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BLACKSTONE ESTATES TENTATIVE MAP SITE PLAN 3

WASHOE COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C5

DATE:	MAY 2016
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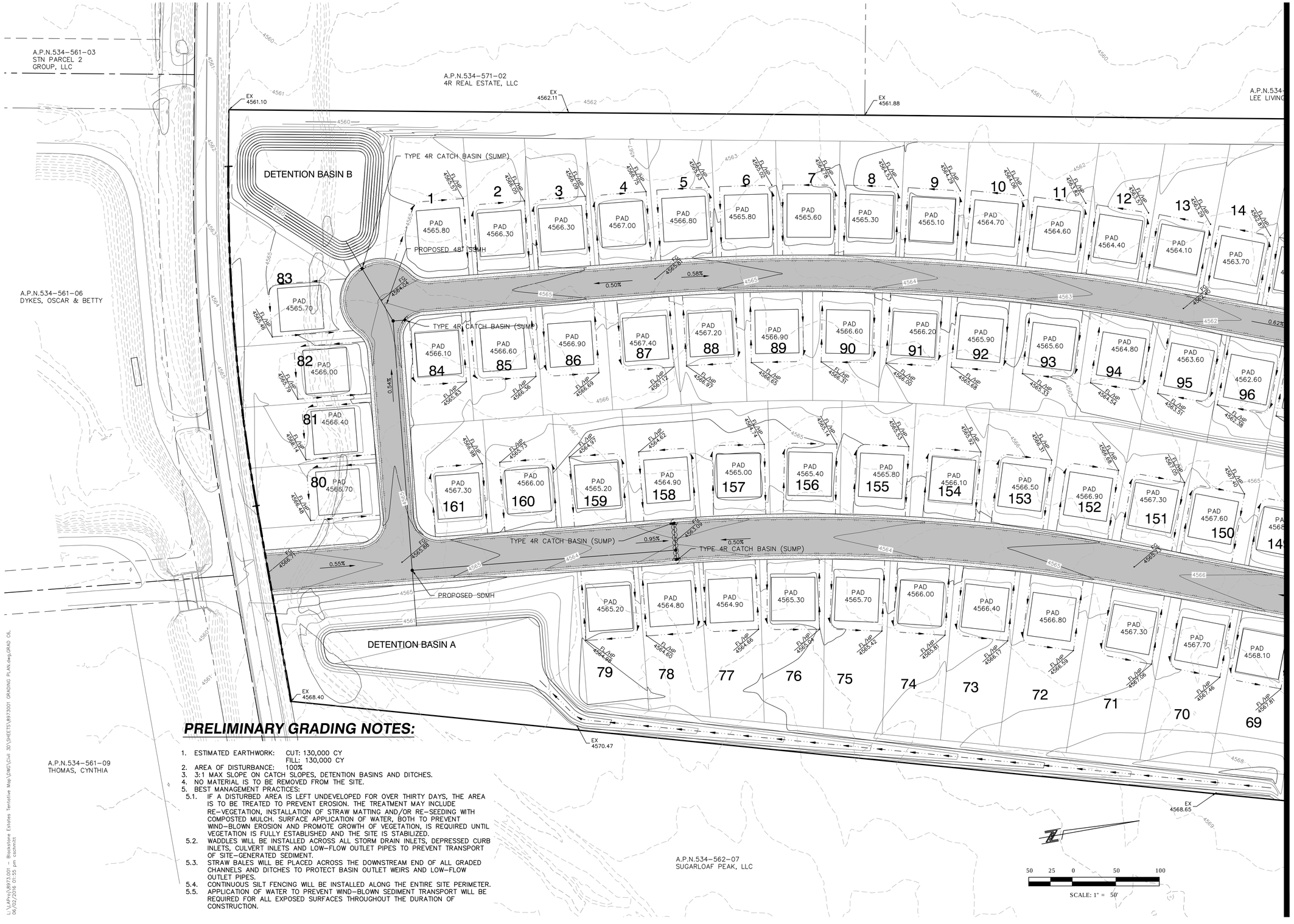

PRELIMINARY GRADING NOTES:

1. ESTIMATED EARTHWORK: CUT: 130,000 CY
   FILL: 130,000 CY
2. AREA OF DISTURBANCE: 100%
3. 3:1 MAX SLOPE ON CATCH SLOPES, DETENTION BASINS AND DITCHES.
4. NO MATERIAL IS TO BE REMOVED FROM THE SITE.
5. BEST MANAGEMENT PRACTICES:
   - 5.1. IF A DISTURBED AREA IS LEFT UNDEVELOPED FOR OVER THIRTY DAYS, THE AREA IS TO BE TREATED TO PREVENT EROSION. THE TREATMENT MAY INCLUDE RE-VEGETATION, INSTALLATION OF STRAW MATTING AND/OR RE-SEEDING WITH COMPOSTED MULCH. SURFACE APPLICATION OF WATER, BOTH TO PREVENT WIND-BLOWN EROSION AND PROMOTE GROWTH OF VEGETATION, IS REQUIRED UNTIL VEGETATION IS FULLY ESTABLISHED AND THE SITE IS STABILIZED.
   - 5.2. WADDLES WILL BE INSTALLED ACROSS ALL STORM DRAIN INLETS, DEPRESSED CURB INLETS, CULVERT INLETS AND LOW-FLOW OUTLET PIPES TO PREVENT TRANSPORT OF SITE-GENERATED SEDIMENT.
   - 5.3. STRAW BALES WILL BE PLACED ACROSS THE DOWNSTREAM END OF ALL GRADED CHANNELS AND DITCHES TO PROTECT BASIN OUTLET WEIRS AND LOW-FLOW OUTLET PIPES.
   - 5.4. CONTINUOUS SILT FENCING WILL BE INSTALLED ALONG THE ENTIRE SITE PERIMETER.
   - 5.5. APPLICATION OF WATER TO PREVENT WIND-BLOWN SEDIMENT TRANSPORT WILL BE REQUIRED FOR ALL EXPOSED SURFACES THROUGHOUT THE DURATION OF CONSTRUCTION.

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BLACKSTONE ESTATES
TENTATIVE MAP
GRADING PLAN 1

WASHOE COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C6

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SCALE: 1" = 50'

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BLACKSTONE ESTATES
TENTATIVE MAP
GRADING PLAN 2

WASHOE COUNTY NEVADA

REV | DATE | DESCRIPTION | BY

TENTATIVE MAP

C7

DATE:	MAY 2016
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   - 5.1. IF A DISTURBED AREA IS LEFT UNDEVELOPED FOR OVER THIRTY DAYS, THE AREA IS TO BE TREATED TO PREVENT EROSION. THE TREATMENT MAY INCLUDE RE-VEGETATION, INSTALLATION OF STRAW MATTING AND/OR RE-SEEDING WITH COMPOSTED MULCH. SURFACE APPLICATION OF WATER, BOTH TO PREVENT WIND-BLOWN EROSION AND PROMOTE GROWTH OF VEGETATION, IS REQUIRED UNTIL VEGETATION IS FULLY ESTABLISHED AND THE SITE IS STABILIZED.
   - 5.2. WADDLES WILL BE INSTALLED ACROSS ALL STORM DRAIN INLETS, DEPRESSED CURB INLETS, CULVERT INLETS AND LOW-FLOW OUTLET PIPES TO PREVENT TRANSPORT OF SITE-GENERATED SEDIMENT.
   - 5.3. STRAW BALES WILL BE PLACED ACROSS THE DOWNSTREAM END OF ALL GRADED CHANNELS AND DITCHES TO PROTECT BASIN OUTLET WEIRS AND LOW-FLOW OUTLET PIPES.
   - 5.4. CONTINUOUS SILT FENCING WILL BE INSTALLED ALONG THE ENTIRE SITE PERIMETER.
   - 5.5. APPLICATION OF WATER TO PREVENT WIND-BLOWN SEDIMENT TRANSPORT WILL BE REQUIRED FOR ALL EXPOSED SURFACES THROUGHOUT THE DURATION OF CONSTRUCTION.

50 25 0 50 100

SCALE: 1" = 50'

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SP58, LLC.

BLACKSTONE ESTATES
TENTATIVE MAP
GRADING PLAN 3

NEVADA

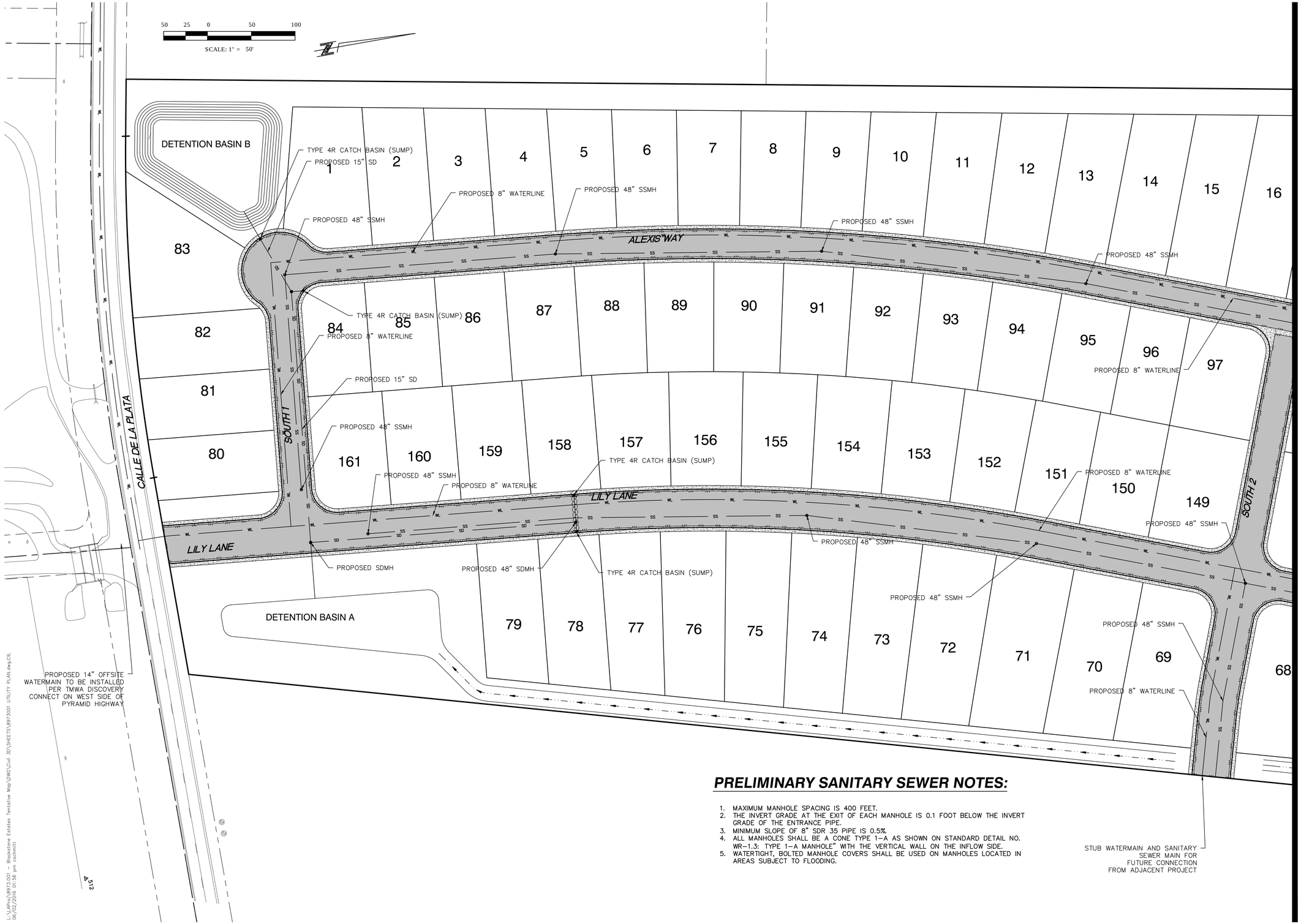
WASHOE COUNTY

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C8

DATE:	MAY 2016
DRAWN BY:	KLN/JH
DESIGNED BY:	RB
CHECKED BY:	TR
JOB NO.:	8973.001



PRELIMINARY SANITARY SEWER NOTES:

1. MAXIMUM MANHOLE SPACING IS 400 FEET.
2. THE INVERT GRADE AT THE EXIT OF EACH MANHOLE IS 0.1 FOOT BELOW THE INVERT GRADE OF THE ENTRANCE PIPE.
3. MINIMUM SLOPE OF 8" SDR 35 PIPE IS 0.5%.
4. ALL MANHOLES SHALL BE A CONE TYPE 1–A AS SHOWN ON STANDARD DETAIL NO. WR–1.3: TYPE 1–A MANHOLE" WITH THE VERTICAL WALL ON THE INFLOW SIDE.
5. WATERTIGHT, BOLTED MANHOLE COVERS SHALL BE USED ON MANHOLES LOCATED IN AREAS SUBJECT TO FLOODING.

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REBECCA C. BERNIER
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CIVIL
No. 19279
5-31-16

SP58, LLC.

BLACKSTONE ESTATES
TENTATIVE MAP
UTILITY PLAN 1

WASHOE COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C9

DATE:	MAY 2016
DRAWN BY:	KLN/JH
DESIGNED BY:	RB
CHECKED BY:	TR
JOB NO.:	8973.001

50 25 0 50 100

SCALE: 1" = 50'

PRELIMINARY SANITARY SEWER NOTES:

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PROPOSED 48" SSMH
PROPOSED 8" WATERLINE
ALEXIS WAY
SOUTH 2
LILY LANE
STUB WATERMAIN AND SANITARY SEWER MAIN FOR FUTURE CONNECTION FROM ADJACENT PROJECT

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5-31-16

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BLACKSTONE ESTATES
TENTATIVE MAP
UTILITY PLAN 2

WASHOE COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C10

DATE:	MAY 2016
DRAWN BY:	KLN/JH
DESIGNED BY:	RB
CHECKED BY:	TR
JOB NO.:	8973.001

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PRELIMINARY SANITARY SEWER NOTES:

1. MAXIMUM MANHOLE SPACING IS 400 FEET.
2. THE INVERT GRADE AT THE EXIT OF EACH MANHOLE IS 0.1 FOOT BELOW THE INVERT GRADE OF THE ENTRANCE PIPE.
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5-31-16

SP58, LLC.
BLACKSTONE ESTATES
TENTATIVE MAP
UTILITY PLAN 3
WASHOE COUNTY, NEVADA

REV	DATE	DESCRIPTION	BY

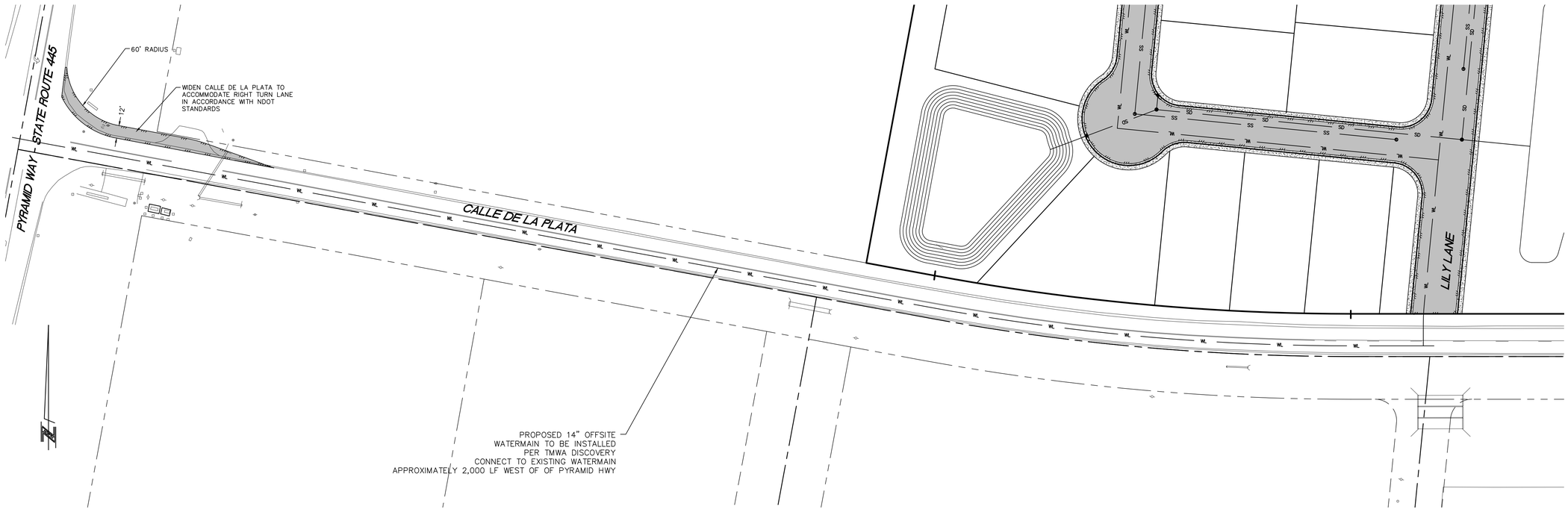
TENTATIVE MAP

C11

DATE:	MAY 2016
DRAWN BY:	KLN/JH
DESIGNED BY:	RB
CHECKED BY:	TR
JOB NO.:	8973.001

50 25 0 50 100

SCALE: 1" = 50'



OFFSITE IMPROVEMENTS

1. 14" WATERMAIN TO BE EXTENDED TO SILENT SPARROW. SEE TMWA DISCOVERY. BORE UNDER PYRAMID HIGHWAY. (NDOT ENCROACHMENT PERMIT REQUIRED)
2. IMPROVE INTERSECTION AT PYRAMID HIGHWAY AND CALLE DE LA PLATA WITH WIDENED AREA FOR RIGHT TURN LANE IF WARRANTED.

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REGISTERED PROFESSIONAL ENGINEER
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Exp: 12/31/16
CIVIL
No. 19273
STATE OF NEVADA
5-31-16

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BLACKSTONE ESTATES
TENTATIVE MAP
OFFSITE IMPROVEMENTS

WASHOE COUNTY NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

C12

DATE:	MAY 2016
DRAWN BY:	KLN/JH
DESIGNED BY:	RB
CHECKED BY:	TR
JOB NO.:	8973.001

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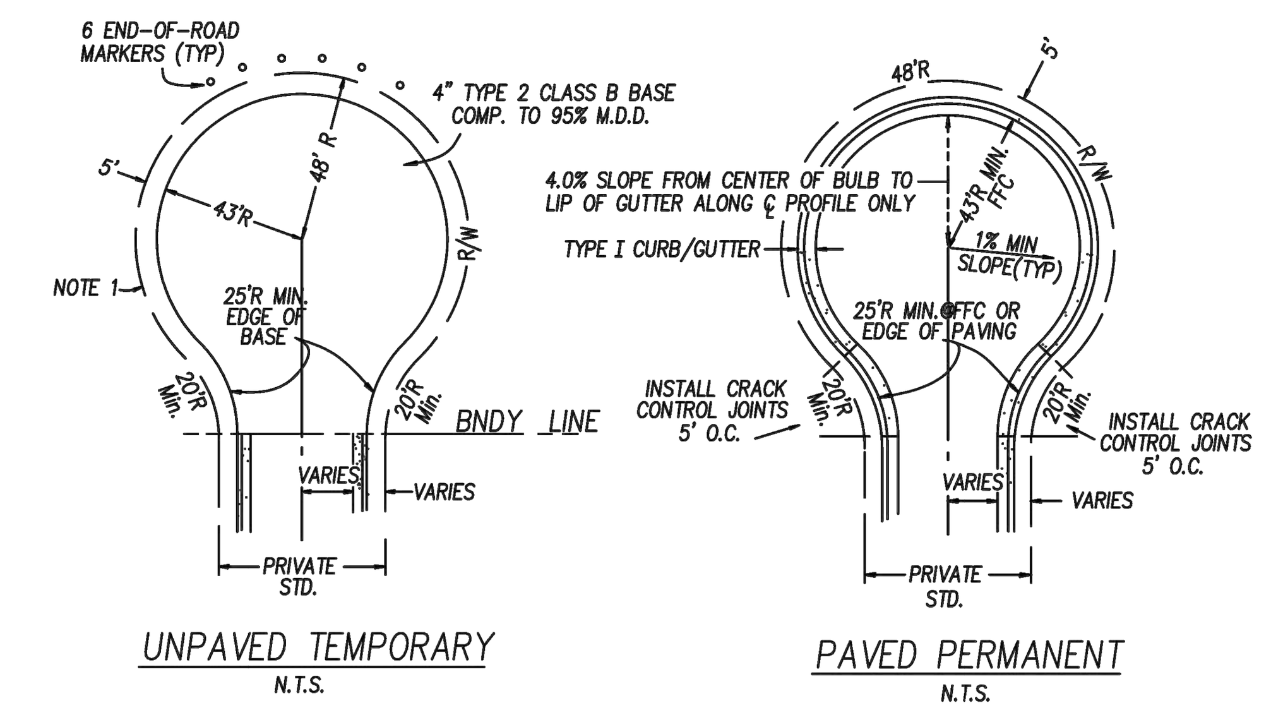
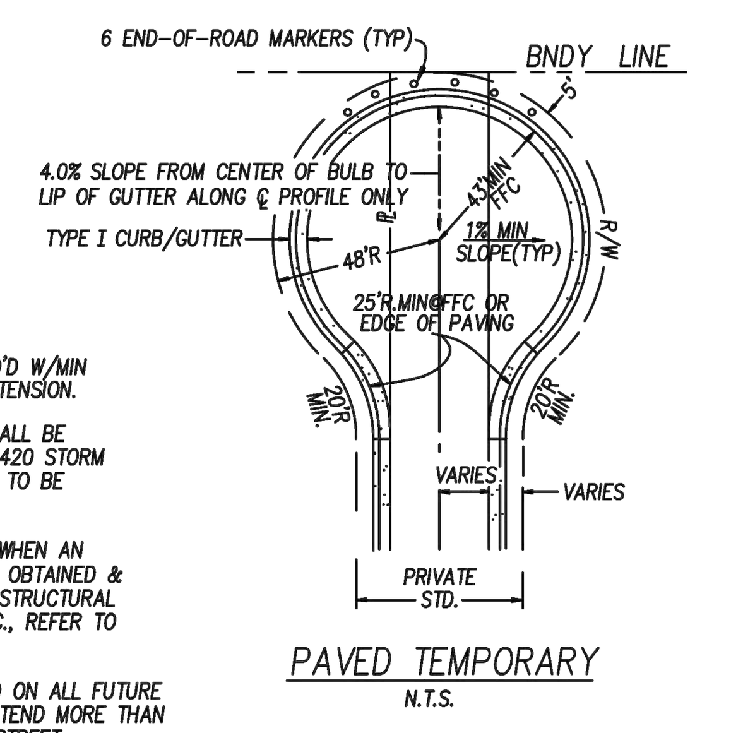


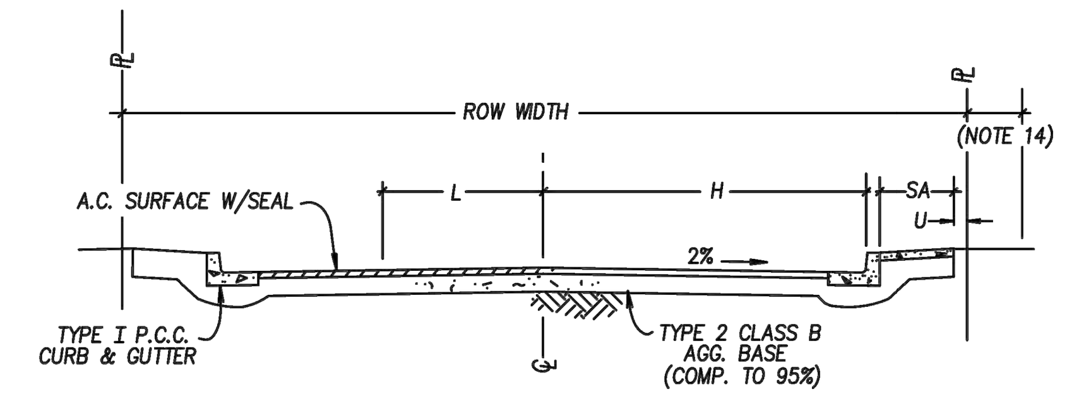


NOTES

1. TEMP TURNAROUND EASEMENT DOCUMENT REQ'D W/MIN 48' RADIUS TO BE ABANDONED W/STREET EXTENSION.
2. DRAINAGE OF UNPAVED TEM 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	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION: WASHOE
			CUL-DE-SAC (PRIVATE STREETS ONLY)	DRAWING NO: W-7.1
				DATE: 6/00 vp; PAGE: W-18.1

CUL-DE-SAC DETAIL (1/D1)
SCALE: N.T.S.



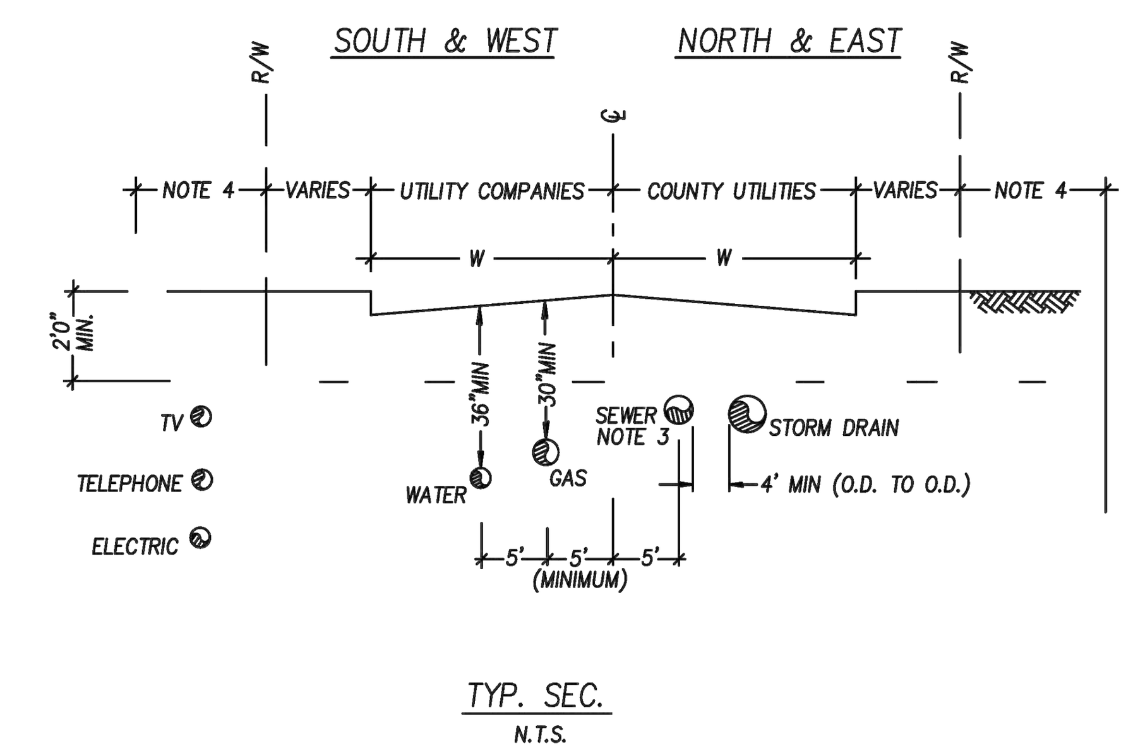
ROW	H	SA	U	L	B	PL	ADT MAX PER 2 TRAVEL LANES	REMARKS
52	20	5	0.5	12	4	0	7300	COLLECTOR
42	16	4	0.5	11	0	2	1000	LOCAL

NOTES

1. ALL WIDTHS ARE IN FEET.
2. H IS MEASURED TO THE FRONT FACE OF CURB.
3. L IS TRAVEL LANE; SA IS SIDEWALK AREA; B IS BICYCLE LANE; ROW IS RIGHT OF WAY PL IS MAX. NUMBER OF PARKING LANES; ADT IS AVERAGE DAILY TRAFFIC.
4. ADT REPRESENTS THE DESIGN VOLUME FOR A TWO LANE FACILITY.
5. BICYCLE LANES SHALL BE PROVIDED IN ACCORDANCE W/THE BICYCLE AND PEDESTRIAN ELEMENT OF THE REGIONAL TRANSPORTATION PLAN AND TO THE SATISFACTION OF THE COUNTY ENGNINEER.
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 CONCRETE AND L SHAPED PER STANDARD DETAIL.
8. SIDEWALK AREA SHALL BE @ 2% SLOPE TOWARD TOP OF CURB & COMPACTED 90% ASTM D-1557, BACKFILL SHALL BE EITHER TYPE 2 CLASS B BASE OR CLASS A BACKFILL.
9. ALL A.C. SURFACES SHALL BE SEALED IN ACCORDANCE WITH WASHOE CO. STANDARDS.
10. RESIDENTIAL 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 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	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION: WASHOE
1	Notes	1/94 vp	ROADWAY SECTIONS (C)	DRAWING NO: W-1.3
2	Corr "U"	2/94 vp	GENERAL APPLICATIONS	
3	Save As W-3.dwg	10/01vp	SUBURBAN AREAS	DATE: 12/93vp; PAGE: 3
4	updated adt	12/05sw	LOT SIZE: 0.5 – 1.5 ACRES	

ROADWAY SECTIONS DETAIL (2/D1)
SCALE: N.T.S.

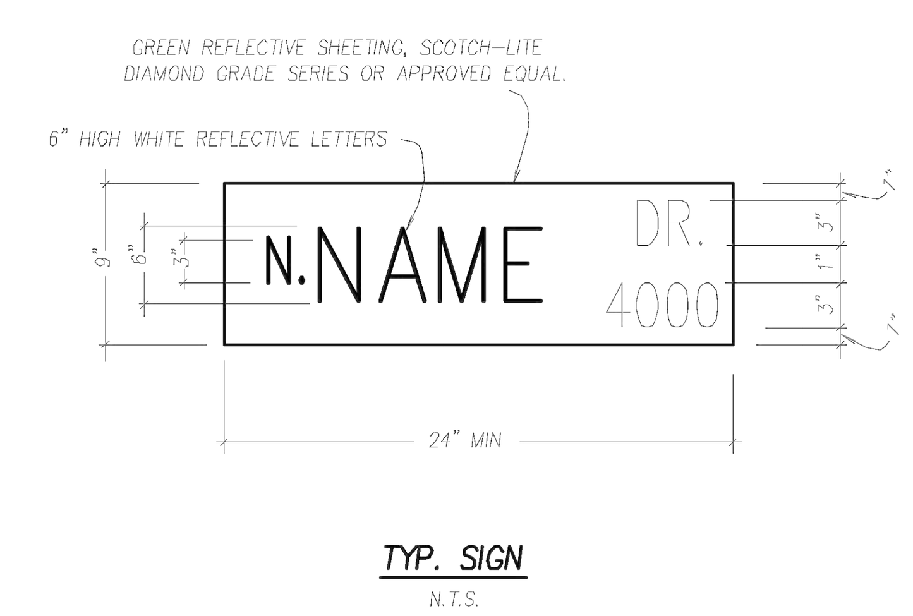


NOTES

1. FOR ALL UTILITIES IN A COMMON TRENCH, SEE STANDARD DETAIL DWG. 1–3.
2. MAINTAIN A MIN SEPARATION OF 5' BETWEEN GAS LINE & WASHOE CO. UTILITIES WATER LINE.
3. 5' MIN FROM FINISHED GRADE TO FLOWLINE OF SANITARY SEWER.
4. MIN 7.5' PUBLIC UTILITY/TRAFFIC CONTROL SIGNAGE/PLOWED SNOW EASEMENT

NO.	REVISED	DATE	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION: WASHOE
1	REDRAWAL	6/94 vp	UTILITY MAIN LOCATIONS	DRAWING NO: W-2.1
				DATE: 6/94 vp; PAGE: 8

UTILITY MAIN LOCATIONS DETAIL (3/D1)
SCALE: N.T.S.



NOTES

1. STREET NAME SIGN SHALL BE IN CONFORMANCE W/LATEST EDITION OF THE M.U.T.C.D.
2. ALL SIGN LETTERING SHALL BE IN UPPERCASE LETTERS AS PROVIDED IN THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS.
3. REFLECTIVE MATERIALS SHALL BE MOUNTED ON .080 GAUGE FLAT PLATE ALUMINUM NO. 6061-T6.
4. REFER TO STANDARD DETAIL DRAWING NO. W-15 FOR MOUNTING AND POLE REQUIREMENTS, UNLESS OTHERWISE SPECIFIED.
5. A MINIMUM OF FOUR (4) SIGNS, PLACED BACK-TO-BACK PER STANDARD DETAIL DRAWING NO. W-15, FOR EACH STREET, IS REQUIRED.

NO.	REVISED	DATE	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION: WASHOE
			STREET NAME SIGN	DRAWING NO: W-6
2	Det., Notes	4/03vp		
1	REDRAWN	9/94vp		DATE: 9/94 vp; PAGE: 17

STREET NAME SIGN DETAIL (4/D1)
SCALE: N.T.S.

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SP58, LLC.

BLACKSTONE ESTATES
TENTATIVE MAP
DETAILS 1

WASHOE COUNTY
NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

D1

DATE:	MAY 2016
DRAWN BY:	KLN/JH
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