Title: Second Reading, Public Hearing, discussion and possible adoption of Bill No. 2738, an Ordinance for approval of a Development Agreement by and between the City of Sparks, Jackling Aggregates, LLC and QK, LLC concerning the development of a parcel 386.87 acre in size located at 555 Highland Ranch Parkway, Washoe County, NV (PCN160050)

Petitioner/Presenter: QK, LLC/Armando Ornelas, Assistant Community Services Director

Recommendation: The Planning Commission recommends that the City Council adopt Bill No. 2738, an ordinance for approval of a Development Agreement by and between the City of Sparks, Jackling Aggregates, LLC and QK, LLC concerning the development of a parcel 386.87 acre in size located at 555 Highland Ranch Parkway.

Financial Impact: No direct financial cost. The fiscal impact analysis submitted by the applicant estimates this annexation and single-family development of 1,223 single family units and 13 acres of commercial uses on the site will produce a projected positive fiscal impact over the 20-year analysis period.

Business Impact (Per NRS 237):
A Business Impact Statement is not required because this is not a rule.

Agenda Item Brief:

The proposed Development Agreement (the "Agreement") is for a parcel 386.87 acres in size located at 555 Highland Ranch Parkway. The parties to the Agreement are the City of Sparks, Jackling Aggregates, LLC (the property owner) and QK, LLC (the developer). The Agreement also constitutes the property owner's petition for inclusion in Impact Fee Service Area #1. The Agreement is coming forward for City Council consideration in conjunction with three related requests for: annexation of the subject property into the city of Sparks; certification of a Comprehensive Plan amendment to change the land use designation of the property from Open Space (OS), Employment Center (EC) and Commercial (C) to Intermediate Density Residential (IDR) and Commercial (C); and, rezoning of the subject parcel from A40 (Agriculture) to SF6 (Single Family Residential – 6,000 sq. ft. lots) and C2 (General Commercial). On April 5, 2018, the Sparks Planning Commission voted to forward recommendations of approval to the City Council for the rezoning, annexation and development agreement requests and approved the Comprehensive Plan amendment.

Background:

The property that is the subject of the proposed Development Agreement (the "Agreement") is 386.87 acres in size and located north of Highland Ranch Parkway just west of the intersection with Pyramid Highway. (Refer to Vicinity Map). The site is currently vacant except for a Truckee Meadows Water Authority (TMWA) water tank located along Highland Ranch Parkway. The subject property was formerly the site of an aggregate mining operation. The aggregate pit is not visible from either Highland Ranch Parkway or Pyramid Highway as it is situated in a bowl surrounded by ridges. The remaining quarry area and substantial portions of the site have been graded and are intended for development. There is a paved access road connecting Highland Ranch Parkway to the quarry site.

The applicant's property is part of approximately 2,000 acres that were brought into the Sparks Sphere of Influence in 2002 as a Cooperative Planning Area with Washoe County. An area plan, known as the West Pyramid Plan, was prepared for this acreage and certified by the City Council in July of 2008. The land use designations for the subject property on the 2016 Sparks Comprehensive Plan Land Use Map – Open Space, Employment Center, and Commercial – are equivalent to but replaced the land uses designated for the site in the West Pyramid Plan.

On March 13, 2017, the City Council directed staff to negotiate and prepare a development agreement pursuant to NRS 278.0201 for the subject property. The proposed Agreement is in response to the Council's direction and is intended to address the type and intensity of development on the site, along with the entitlements necessary to develop the property. The

Agreement also addresses the requirements and terms for the provision of infrastructure, including the property's possible inclusion in Impact Fee Service Area Number 1 (IFSA#1). Another purpose of the Agreement is to provide for the applicant to waive, as permitted by NRS 278.0201, certain statutory timeframes for the processing of applications so that the land use requests can be considered concurrently by the Planning Commission and the City Council. Finally, for the owners and developer, the Agreement is intended to provide for greater regulatory predictability during the project's build-out.

The Agreement is coming forward for City Council consideration in conjunction with three related requests for: annexation of the subject property into the city of Sparks; certification of a Comprehensive Plan amendment to change the land use designation of the site from Open Space (OS), Employment Center (EC) and Commercial (C) to Intermediate Density Residential (IDR) and Commercial (C); and, rezoning of the subject parcel from A40 (Agriculture) to SF6 (Single Family Residential – 6,000 sq. ft. lots) and C2 (General Commercial).

On April 5, 2018, the Planning Commission reviewed the applicant's four requests and recommended the City Council approve the annexation petition, certify the comprehensive plan amendment and approve the development agreement and rezoning requests. (Please refer to the Planning Commission Report of Action.)

On May 9, 2018, the Regional Planning Commission (RPC) held a public hearing and reviewed the requested Comprehensive Plan amendment. The RPC also reviewed the project that is proposed for the site, as described in the development agreement, as a project of regional significance. The RPC determined that both the Comprehensive Plan amendment and the proposed project conform with the Truckee Meadows Regional Plan.

Analysis:

The proposed Agreement is for a parcel 386.87 acres in size located at 555 Highland Ranch Parkway. The Agreement also constitutes the property owner's petition for inclusion in Impact Fee Service Area #1. The parties to the Agreement are the City of Sparks, Jackling Aggregates, LLC (the property owner) and QK, LLC (the developer).

As discussed in the Background section, this request is coming forward for City Council consideration in conjunction with three related requests for annexation, a Comprehensive Plan land use amendment and rezoning of the property. The purpose of bundling a development agreement with these other requests is to provide the public, third-party reviewing agencies, the Planning Commission, and City Council with an understanding of the development proposed for the subject property at the time these requests are considered. The Agreement is also intended to serve as the basis for satisfying the so-called concurrency requirement (Goal 3.5 and Policy 3.5.1) of the 2012 Truckee Meadows Regional Plan for infrastructure and public services that must be addressed with the land use applications. For these reasons, the Agreement supports the findings for approval for the other three requests.

Per SMC 20.05.09 (Development Agreements), the City Council may approve a development agreement if it is consistent with the Comprehensive Plan and otherwise consistent with Nevada or federal law. In particular, the Agreement is intended to serve as the basis for satisfying the concurrency requirement for the associated land use approvals. The Agreement must be approved by the Sparks City Council to take effect. It includes the following provisions:

- Section Two is intended to provide the developer a degree of regulatory predictability during the build-out of the project. It defines the rules and fees that apply to development of the project.
- Permitted uses and density are addressed in Section 3.1, which specifies that 1,200-1,800 residential units are permitted at a gross density of between 3.1 and 4.6 dwelling

units per acre. Single family detached and attached units are permitted in the portion of the property for which SF6 zoning is requested. All uses permitted in the C2 zoning district, including multi-family housing (by Conditional Use Permit), would be permitted in the portion of the property for which C2 zoning is requested.

- Required infrastructure improvements are addressed in Section 3.2. This includes the off-site infrastructure, at the developer's expense, necessary for the proposed project. The required off-site improvements include sanitary sewer upgrades and flood control and drainage improvements.

  The Agreement requires the widening (to 4 travel lanes), prior to the issuance of any building permits for structures, of Highland Ranch Parkway from Pyramid Highway to the entrance to the project. Also required are the improvements to the intersection of Highland Ranch Parkway and Pyramid Highway recommended in the Traffic Study prepared by Solaegui Engineers, which has been reviewed by City staff and the Nevada Department of Transportation (NDOT). The intersection improvements must be completed prior to issuance of any certificate of occupancy for, or final inspection of, any dwelling unit in excess of 650 dwelling units.

- Section 3.2(d) also requires, per the determination of the City's Fire Chief, construction of a private, gated secondary fire apparatus access road prior to issuance of a certificate of occupancy for and/or final inspection of any dwelling unit in excess of 200 dwelling units. Section 3.2(d) also requires that the interior street providing primary access to the project be a four-lane, median-divided roadway from Highland Ranch Parkway to the first entrances of Villages 3 and 4, which are shown on the land plan exhibit to the development agreement. In addition, all dwelling units and commercial structures intended for or used for human occupancy must be equipped with fire suppression systems. Finally, emergency access points must be provided to all common areas. These access points shall be a minimum of sixteen (16) feet wide, gated, and posted with signs prohibiting parking.
- Section 3.11 constitutes the developer's and property owner's petition to include the subject property in IFSA#1 and their agreement not to withdraw the petition except as permitted by the Agreement.
- Section 3.4 of the Agreement limits the total area to be cleared, graded or disturbed to 225 (58.2%) of the 387 acres. The developer is required to convey, with each final subdivision map, the lands designated as open space to the entity responsible for maintenance of those lands (e.g., homeowner's association).
- Section Four permits the City Council to review the developer's compliance with the terms of the Agreement within 12 months of its effective date. It also requires the developer to report, every 24 months after that initial review, on the number of units approved and built, development densities, and status of the project.
- Section 6.1 specifies the duration of the Agreement, which is 15 years. The Agreement grants the developer the right to request one 5-year extension subject to certain conditions.

Consistency with Comprehensive Plan

The Planning Commission determined that the Agreement is consistent with the Comprehensive Plan in part because it serves as the petition for the subject property to be brought into IFSA#1. Inclusion of the subject property in IFSA#1 provides a plan and funding mechanism for the provision of sanitary sewer and storm drain improvements, a fire station, and regional trails to serve development on this site. In Section 3.2, the Development Agreement also obligates the developer to increase the capacity of Highland Ranch Parkway between the Pyramid Highway and the entrance to the subject property, and to construct improvements to the intersection of those two roadways necessary to maintain a Level of Service E.

The Agreement thus supports and is consistent with the following Comprehensive Plan goals and policies:

Policy MG5 When reviewing master plan amendments for sites over 5 acres, the City will evaluate or cause to be evaluated: a) the impacts on existing and planned facilities and infrastructure; b) the impacts on existing and planned public services; c) the proposed land use in relationship to existing land uses; and, d) the fiscal implications for public service providers of the proposed land use changes as documented in a fiscal impact analysis.

Policy CF1: When reviewing new development, the City will not approve an application unless the City services can be provided at acceptable service levels.

The Planning Commission viewed the proposed Agreement as supporting a finding that the City can provide municipal services to the subject property concurrent with its development. This enabled the Planning Commission to make certain findings, including those regarding concurrency and fiscal impact, in support of the applicant's annexation, Comprehensive Plan amendment, and rezoning requests.

Alternatives:

1. The City Council can adopt Bill 2738 for approval of the Development Agreement as presented.
2. The City Council can modify the Development Agreement subject to the consent of Jackling Aggregates, LLC and QK, LLC.
3. The City Council can reject the Development Agreement.

Recommended Motion:

I move to adopt Bill No. 2738, an Ordinance for approval of a Development Agreement by and between the City of Sparks, Jackling Aggregates, LLC and QK, LLC concerning the development of a parcel 386.87 acre in size located at 555 Highland Ranch Parkway, Washoe County, NV.

When Recorded Return to:
Sparks City Clerk
PO Box 857
Sparks, NV 89432

BILL NO. 2738 **INTRODUCED BY COUNCIL**

ORDINANCE NO. _____ **PCN16050 – THE QUARRY, 386.87 ACRES AT 555 HIGHLAND RANCH PARKWAY**

AN ORDINANCE BY THE CITY OF SPARKS TO APPROVE A DEVELOPMENT AGREEMENT WITH JACKLING AGGREGATES, LLC AND QK, LLC CONCERNING THE DEVELOPMENT OF A PARCEL 386.87 ACRES IN SIZE LOCATED AT 555 HIGHLAND RANCH PARKWAY, SPARKS, NEVADA AND OTHER MATTERS PROPERLY RELATED THERETO.

WHEREAS, Jackling Aggregates, LLC owns certain real property situated in the County of Washoe, State of Nevada more specifically described as Assessor's Parcel Number 083-011-15, more particularly described on Exhibit A and depicted on Exhibit B attached hereto and incorporated by this reference (collectively, the "Property");

WHEREAS, the City is authorized, pursuant to Chapter 278 of the Nevada Revised Statutes and Title 20 of the Sparks Municipal Code, to enter into agreements concerning the development of land such as this Agreement with persons having a legal or equitable interest in real property;

WHEREAS, QK, LLC filed annexation, comprehensive plan and zoning applications with the City of Sparks to annex the Property into

the city of Sparks and change the comprehensive plan and zoning designations on the Property, more particularly described as City of Sparks Application Nos. PCN16-0050, AX16-0003, MPA17-0005, and RZ17-0006 (collectively, the "Applications");

WHEREAS, the City, Jackling Aggregates, LLC and QK, LLC (collectively, the "Parties") acknowledge that this Agreement will (i) promote the health, safety and general welfare of the City and its inhabitants, (ii) minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, (iii) ensure attainment of the maximum efficient utilization of resources within the City at the least economic cost to its citizens, and (iv) otherwise achieve the goals and purposes for which the laws governing development agreements were enacted;

WHEREAS, the Parties desire to enter this Agreement in order to provide for processing of the Applications and development of the Property; and

WHEREAS, NRS 278.0203 and SMC 20.05.09 allow the Sparks City Council to approve a development agreement by ordinance.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF SPARKS DOES ORDAIN:

SECTION 1: The Development Agreement by and between the City of Sparks, Jackling Aggregates, LLC and QK, LLC is approved.

SECTION 2: All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SECTION 3: The City Clerk is instructed and authorized to publish the title to this ordinance as provided by law and to record the approved Development Agreement as provided by law.

SECTION 4: This ordinance shall become effective upon passage, approval, publication and recordation.

SECTION 5: The provisions of this ordinance shall be

liberally construed to effectively carry out its purposes in the interest of the public health, safety, welfare and convenience.

SECTION 6: If any subsection, phrase, sentence or portion of this section is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions.

SECTION 7: The City Council finds that this ordinance is not likely to impose a direct and significant economic burden upon a business or directly restrict the formation, operation or expansion of a business, or is otherwise exempt from Nevada Revised Statutes Chapter 237.

PASSED AND ADOPTED this _____ day of _____, 2018, by the following vote of the City Council:

AYES:

NAYS:

ABSENT:

ABSTAIN:

APPROVED this _____ day of _____, 2018 by:

_____

GENO MARTINI, Mayor

ATTEST:

_____

Teresa Gardner, City Clerk

APPROVED AS TO FORM & LEGALITY:

_____

CHESTER H. ADAMS, City Attorney

Exhibit A

The Quarry: Legal Description

All that certain real property situate within a portion of Section 9, Township 20 North, Range 20 East, Mount Diablo Meridian, County of Washoe, State of Nevada, described as follows:

Parcel 2 as shown on the Record of Survey to support a Boundary Line Adjustment (RS3818) filed within the Official Records of Washoe County, Nevada on June 30, 2000 as File No. 2460839 and being more particularly described as follows:

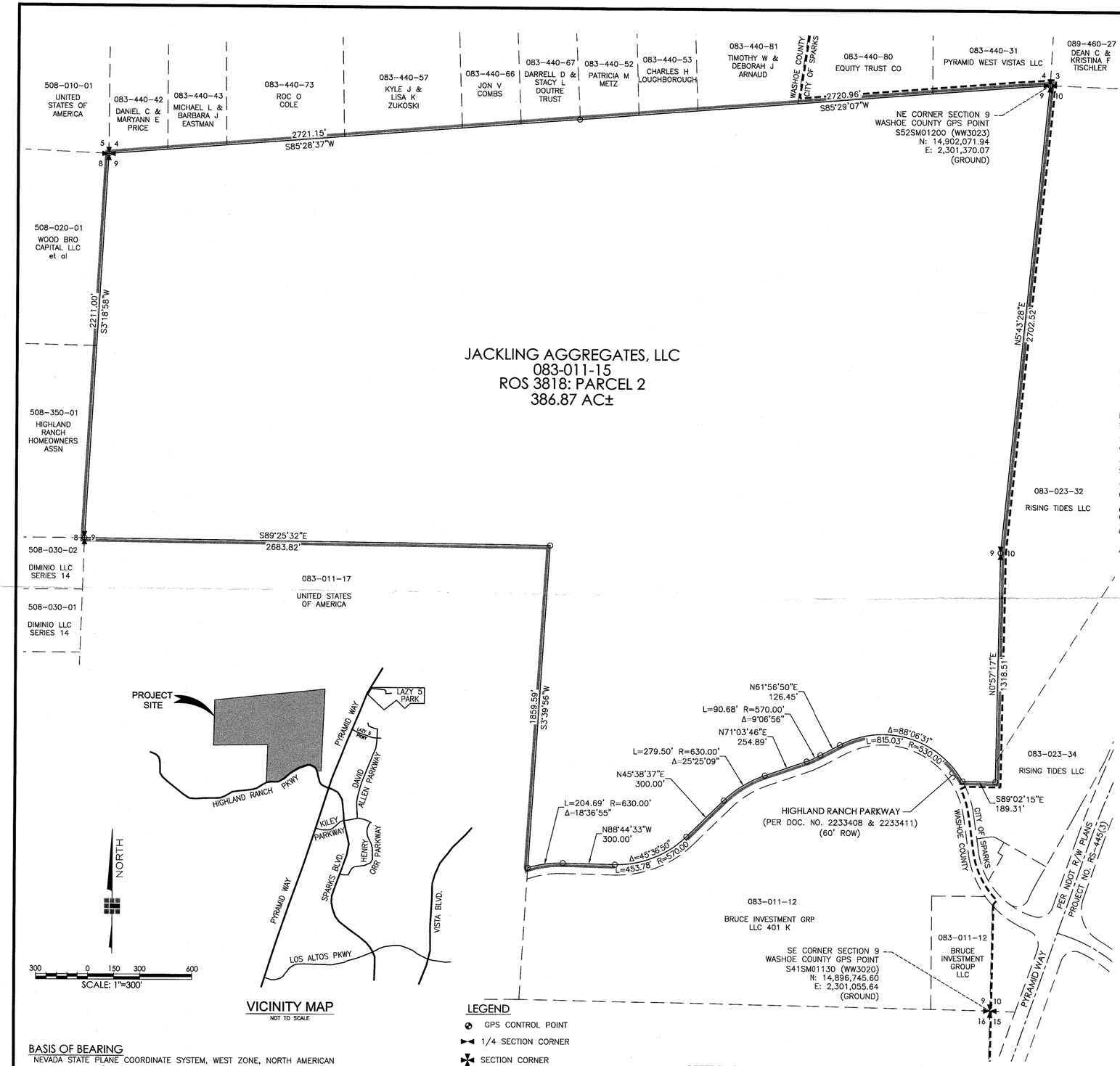
Beginning at the Northeast corner of Section 9;
South 05°43'28" West, 2702.52 feet to the East one- quarter (E ¼) corner of Section 9; Continuing along the Easterly line of Section 9, South 00°57'17" West, 1318.51 feet to the Northerly line of the Southeast one-quarter (SE ¼) of Section 9; Thence along the Northerly line of the Southeast one-quarter (SE ¼) of Section 9, North 89°02'15" West, 189.31 feet to the Northerly right-of-way of Highland Ranch Parkway; Leaving the Northerly line of the Southeast one-quarter (SE ¼) of Section 9, along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a non-tangent curve to the left, from a tangent which bears North 29°56'39"West, having a length of 815.03 feet and a radius of 530.00 feet, through a central angle of 88°06'31"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, South 61°56'50" West, 126.45 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the right, having a length of 90.68 feet and a radius of 570.00 feet, through a central angle of 09°06'56"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, South 71°03'46" West, 254.89 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the left, having a length of 279.50 feet and a radius of 630.00 feet, through a central angle of 25°25'09"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, South 45°38'37" West, 300.00 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the right, having a length of 453.78 feet and a radius of 570.00 feet, through a central angle of 45°36'50"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, North 88°44'33" West, 300.00 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the left, having a length of 204.69 feet and a radius of 630.00 feet, through a central angle of 18°36'55", to the North-South centerline of Section 9; Leaving the Northerly right-of-way of Highland Ranch Parkway, along the North-South centerline of Section 9, North 03°39'56" East, 1859.59 feet to the center of Section 9; Thence along the East-West centerline of Section 9, North 89°25'32" West, 2683.82 feet to the West one-quarter (1/4) of Section 9; Thence along the West line of Section 9, North 03°18'58" East, 2211.00 feet to the Northwest corner of Section 9; Thence along the North line of Section 9, North 85°28'37" East, 2721.15 feet to the North one-quarter (N ¼) corner of Section 9; Continuing along the North line of Section 9, North 85°29'07" East, 2720.96 feet to the Northeast corner of Section 9 and the Point of Beginning.

Containing 386.87 acres, more or less.

11/23/16

APN: **083-011-15**

Exhibit B



VICINITY MAP
NOT TO SCALE

LEGAL DESCRIPTION

ALL THAT CERTAIN REAL PROPERTY SITUATE WITHIN A PORTION OF SECTION 9, TOWNSHIP 20 NORTH, RANGE 20 EAST, MOUNT DIABLO MERIDIAN, COUNTY OF WASHOE, STATE OF NEVADA, DESCRIBED AS FOLLOWS:

PARCEL 2 AS SHOWN ON THE RECORD OF SURVEY TO SUPPORT A BOUNDARY LINE ADJUSTMENT (RS3818) FILED WITHIN THE OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA ON JUNE 30, 2000 AS FILE NO. 2460839 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF SECTION 9;

SOUTH 05°43'28" WEST, 2702.52 FEET TO THE EAST ONE-QUARTER (E ¼) CORNER OF SECTION 9;

CONTINUING ALONG THE EASTERLY LINE OF SECTION 9, SOUTH 00°57'17" WEST, 1318.51 FEET TO THE NORTHERLY LINE OF THE SOUTHEAST ONE-QUARTER (SE ¼) OF SECTION 9;

THENCE ALONG THE NORTHERLY LINE OF THE SOUTHEAST ONE-QUARTER (SE ¼) OF SECTION 9, NORTH 89°02'15" WEST, 189.31 FEET TO THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY;

LEAVING THE NORTHERLY LINE OF THE SOUTHEAST ONE-QUARTER (SE ¼) OF SECTION 9, ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, FROM A TANGENT WHICH BEARS NORTH 29°56'39"WEST, HAVING A LENGTH OF 815.03 FEET AND A RADIUS OF 530.00 FEET, THROUGH A CENTRAL ANGLE OF 88°06'31";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, SOUTH 61°56'50" WEST, 126.45 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A LENGTH OF 90.68 FEET AND A RADIUS OF 570.00 FEET, THROUGH A CENTRAL ANGLE OF 09°06'56";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, SOUTH 71°03'46" WEST, 254.89 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A LENGTH OF 279.50 FEET AND A RADIUS OF 630.00 FEET, THROUGH A CENTRAL ANGLE OF 25°25'09";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, SOUTH 45°38'37" WEST, 300.00 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A LENGTH OF 453.78 FEET AND A RADIUS OF 570.00 FEET, THROUGH A CENTRAL ANGLE OF 45°36'50";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, NORTH 88°44'33" WEST, 300.00 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A LENGTH OF 204.69 FEET AND A RADIUS OF 630.00 FEET, THROUGH A CENTRAL ANGLE OF 18°36'55", TO THE NORTH-SOUTH CENTERLINE OF SECTION 9;

LEAVING THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE NORTH-SOUTH CENTERLINE OF SECTION 9, NORTH 03°39'56" EAST, 1859.59 FEET TO THE CENTER OF SECTION 9;

THENCE ALONG THE EAST-WEST CENTERLINE OF SECTION 9, NORTH 89°25'32" WEST, 2683.82 FEET TO THE WEST ONE-QUARTER (1/4) OF SECTION 9;

THENCE ALONG THE WEST LINE OF SECTION 9, NORTH 03°18'58" EAST, 2211.00 FEET TO THE NORTHWEST CORNER OF SECTION 9;

THENCE ALONG THE NORTH LINE OF SECTION 9, NORTH 85°28'37" EAST, 2721.15 FEET TO THE NORTH ONE-QUARTER (N¼) CORNER OF SECTION 9;

CONTINUING ALONG THE NORTH LINE OF SECTION 9, NORTH 85°29'07" EAST, 2720.96 FEET TO THE NORTHEAST CORNER OF SECTION 9 AND THE POINT OF BEGINNING.

CONTAINING 386.87 ACRES, MORE OR LESS.

APN: 083-011-15

PETITIONER

JACKLING AGGREGATES, LLC
ATTN: KRISTI GIUDICI
1475 E. GREG STREET, SUITE A
SPARKS, NV 89431

SURVEYOR'S CERTIFICATE

I, HARLAN K. KING, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF NEVADA, DO HEREBY STATE:

1. THIS MAP CORRECTLY REPRESENTS THE TOTAL AREA OF LAND PROPOSED FOR ANNEXATION INTO THE CITY OF SPARKS.
2. THE PROPERTY SHOWN LIES WITHIN A PORTION OF SECTION 9, TOWNSHIP 20 NORTH, RANGE 20 EAST, M.D.M.
3. THE SURVEY WAS COMPLETED ON NOVEMBER 22, 2016.

HARLAN K. KING, PLS 5665

PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA — HARLAN K. KING — No. 5665 — 11/22/16

EXP. 06/30/17

CITY COUNCIL APPROVAL

APPROVED AND ACCEPTED BY THE CITY COUNCIL OF THE CITY OF SPARKS, WASHOE COUNTY, NEVADA, ON THE _____ DAY OF _____, 2017 BY ORDINANCE _____.

_____ DATE

GENO MARTINI, MAYOR

Exhibit B

BASIS OF BEARING

NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE, NORTH AMERICAN DATUM OF 1983/1994, HIGH ACCURACY REFERENCE NETWORK (NAD 83/94-HARN), AS DETERMINED FROM THE FOUND POSITIONS OF THE MONUMENTS SHOWN HEREON AS "WW3020" AND "WW3023" USING THE COORDINATES AS PUBLISHED BY THE CITY OF SPARKS, PER RECORD OF SURVEY MAP NO. 3818, FILE NO. 2460839, OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA. (I.E. N03°22'08"E)

LEGEND

- GPS CONTROL POINT
- 1/4 SECTION CORNER
- SECTION CORNER
- ADJACENT PARCEL LINE
- BOUNDARY LINE
- SECTION/GPS TIE
- ANNEXATION BOUNDARY
- EXISTING CITY LIMIT

REFERENCE

1. RECORD OF SURVEY MAP NO. 3818, FILE NO. 2460839, JUNE 30, 2000, OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA

NOTE

1. THIS MAP DOES NOT REPRESENT A FIELD SURVEY AND IS BASED ON RECORD INFORMATION ONLY.

MAP IN SUPPORT OF A
PETITION FOR ANNEXATION TO THE CITY OF SPARKS
FOR
THE QUARRY
JACKLING AGGREGATES, LLC

BEING THE NW 1/4, NE 1/4, AND A PORTION OF THE SE 1/4 OF SECTION 9 TOWNSHIP 20 NORTH, RANGE 20 EAST, M.D.M.

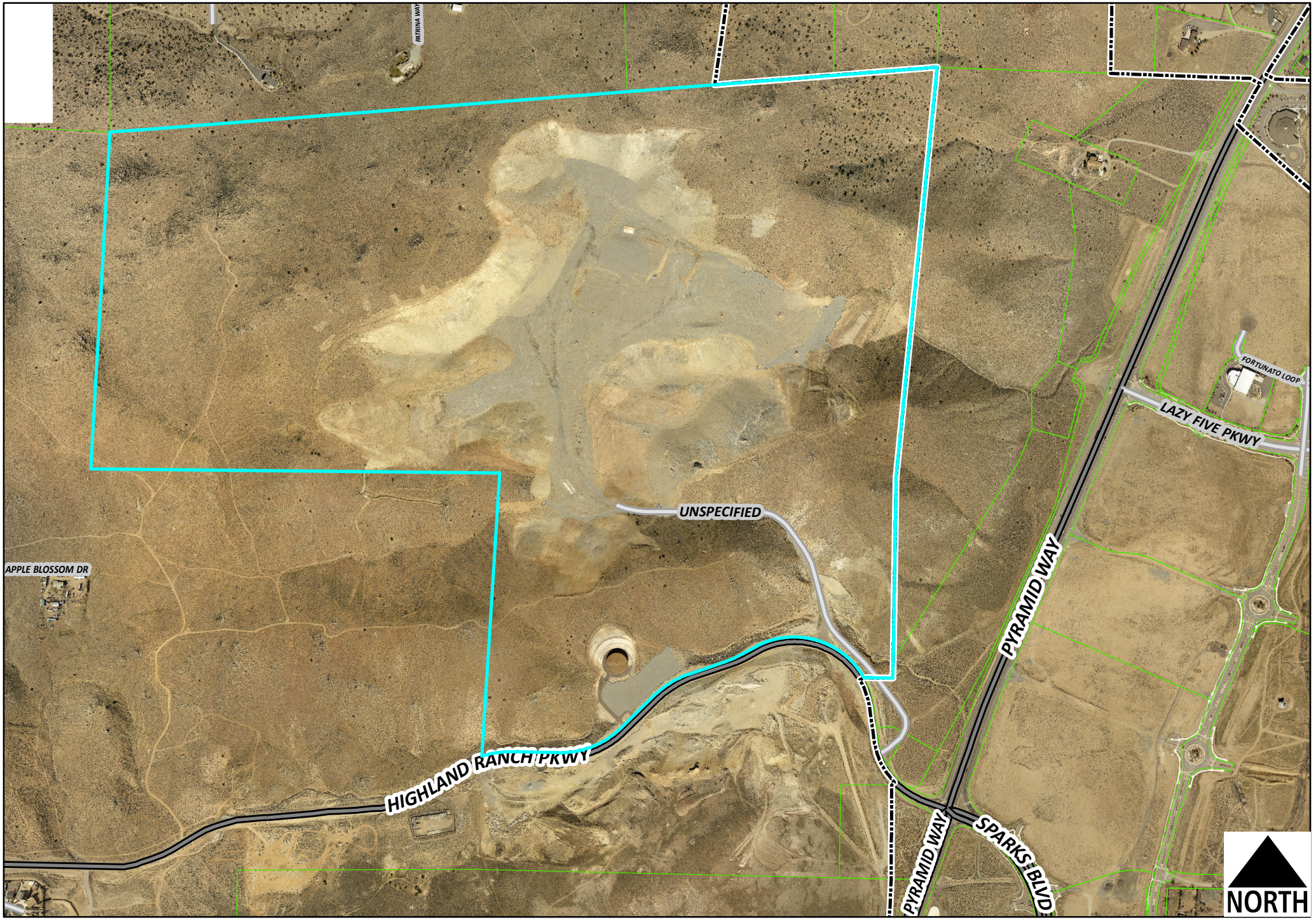
CITY OF SPARKS WASHOE COUNTY NEVADA

CHRISTY CORPORATION
1000 Kiley Pkwy | Sparks Nevada 89436
P 775.502.8552 christynv.com

SHEET 1 OF 1

Vicinity Map
PCN16050

Exhibit A



Recording Requested by and
When Recorded Mail To:

Teresa Gardner, City Clerk
City of Sparks
431 Prater Way
P.O. Box 857
Sparks, Nevada 89432-0857

The undersigned hereby affirms that this document submitted for recording does not contain the personal information of any person or persons per N.R.S. 239B.030.
_____
Signature of Declarant or Agent

THIS DEVELOPMENT AGREEMENT ("Agreement") is made and entered into this ___ day of _____, 2018, by and between the CITY OF SPARKS, a municipal corporation of the State of Nevada ("City"); Jackling Aggregates, LLC, a Nevada Limited Liability Corporation ("Owner"); and QK, LLC, a Nevada Limited Liability Corporation ("Master Developer"). The City and Owner and Master Developer are sometimes individually referred to as a "Party" and collectively as the "Parties."

RECITALS

A. The City is authorized, pursuant to Chapter 278 of the Nevada Revised Statutes and Title 20 of the Sparks Municipal Code, to enter into development agreements such as this Agreement with persons having a legal or equitable interest in real property in order to establish long-range plans for the development of such property.

B. Owner has authorized Master Developer to develop the Property legally described by "Exhibit A" (metes and bounds) attached hereto (the "Property").

C. The Property currently consists of one (1) parcel that totals 386.87 acres, as shown in "Exhibit B" (graphic depiction) attached hereto.

D. Master Developer proposes developing the Property with residential and commercial uses as allowed by the Code in effect on the date of this Agreement in the land uses identified in the master plan amendment and zone change amendment described in Case No. PCN160050 and the Land Plan attached as "Exhibit C."

E. The Parties acknowledge that this Agreement will (i) promote the health, safety and general welfare of the City and its inhabitants, (ii) minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, (iii) ensure attainment

of the maximum efficient utilization of resources within the City at the least economic cost to its citizens, and (iv) otherwise achieve the goals and purposes for which the laws governing development agreements were enacted.

F. As a result of the development of the Property, the City will receive needed housing, jobs, sales and other tax revenues and significant increases to its real estate property tax base that meet or exceed the cost of providing public services, facilities and infrastructure to the Property as described in the Fiscal Analysis attached as "Exhibit D." The City will additionally receive a greater degree of certainty with respect to the timing and orderly development of the Property and City infrastructure by a developer with significant economic resources and experience in the development process.

G. The Master Developer understands and acknowledges that there are insufficient public facilities and infrastructure available at the Property in order to properly construct, populate, and serve the Property. Subject to the terms and conditions of this Agreement, the Master Developer agrees to provide the necessary improvements to public facilities and infrastructure on the Property and outside the Property as specifically provided for in the Infrastructure Plan attached as "Exhibit E."

H. The Master Developer understands and acknowledges that the Property is currently outside a four-minute travel time for Fire Department response to fire, medical, and other emergency service calls and, due to the Property's location and characteristics, certain design requirements and development restrictions as stated in this Agreement are appropriate and necessary.

I. The Master Developer understands and acknowledges that the development of the Property is constrained by the steep slopes naturally occurring thereon as depicted in the Slope Analysis, attached hereto and incorporated by reference as part of the Infrastructure Plan, "Exhibit E."

J. The Master Developer desires to enter into a development agreement with City pursuant to NRS 278.0201 to obtain reasonable assurances that it may develop the Property in accordance with the terms, conditions and intent of this Agreement. The Master Developer's decision to enter into this Agreement and commence development of the Property is based on expectations of proceeding and the right to proceed with the Property in accordance with this Agreement and any other Applicable Rules.

K. The Master Developer further acknowledges that this Agreement was made part of the record at the time of its approval by the City Council and that the Master Developer agrees without protest to the requirements, obligations, limitations, and conditions imposed by this Agreement.

L. The City Council, having determined that the development of the Property in the manner proposed in Exhibits C, D, and E is beneficial to the City, that this Agreement is in conformance with the City's Comprehensive Plan, the Sparks Municipal Code, and state and federal law, and that all other substantive and procedural requirements for approval of

this Agreement have been satisfied, and after giving notice as required by relevant law, and after introducing this agreement by ordinance at a public meeting on _____ _____ and after a subsequent public hearing to consider the substance of this Agreement on _____, found this Agreement to be in the public interest and lawful in all respects, and approved the execution of this Agreement by the Mayor of the City of Sparks.

NOW, THEREFORE, in consideration of the foregoing recitals, the promises and covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

SECTION ONE
DEFINITIONS

For all purposes of this Agreement, except as otherwise expressly provided or unless the context otherwise requires, the following terms shall have the following meanings:

"Administrator" means the person holding the position of City Manager of the City of Sparks at any time or his designee.

"Agreement" means this development agreement and at any given time includes all addenda and exhibits incorporated by reference and all amendments which hereafter are duly entered into in accordance with the terms of this Agreement.

"Applicable Rules" means and refers to:

(a) The provisions of the Code and all other uniformly-applied City rules, policies, regulations, ordinances, laws, general or specific, which were in effect on the Effective Date, including without limitation City ordinances, resolutions, or regulations governing the permitted uses of land, density and standards for design;

(b) This Agreement; and

(c) The term "Applicable Rules" does not include:

(i) Any ordinances, laws, policies, regulations or procedures adopted by a governmental entity other than City;

(ii) Any fee or monetary payment prescribed by City ordinance which is applied to any development or construction subject to the City's jurisdiction; or

(iii) Any applicable state or federal law or regulation.

"Building Codes" means the Building Codes and Fire Codes in effect at the time of issuance of a permit for a particular development activity.

"City" means the City of Sparks, together with its successors and assigns.

"City Council" means the Sparks City Council.

"Code" means the Sparks Municipal Code, including all ordinances, rules, regulations, standards, criteria, manuals, appendices, and other references adopted therein.

"Development Parcels" means legally subdivided parcels of land within the Project that are intended to be developed or further subdivided.

"Development Area" means the areas of the Property that the Master Developer expects or plans to develop, as shown in Exhibit B and Exhibit C to this Agreement.

"Effective Date" means the date, on or after the adoption by City of an ordinance approving the execution of this Agreement, and the subsequent execution of this Agreement by the Parties, on which this Agreement is recorded in the Office of the County Recorder of Washoe County. Each party agrees to cooperate as requested by the other party to cause the recordation of this Agreement without delay.

"Entitlement" means any land use approval, including without limitation, any master plan or other zoning approval, annexation, Subdivision Map, tentative map, final map, parcel map, special use permit, permitted land use, density of tentative or final mapped Development Parcels, building permit, grading permit, and other land use entitlements or permits, issued for the Project or any portion of the Property or in favor of Master Developer or its successor(s) in connection with the development of the Property.

"Entitlement Request" means a request by Master Developer or its authorized designee for any land use approval for development of the Project in accordance with this Agreement, including, without limitation, parcel map, tentative subdivision map or final subdivision map, and including the annexation, master plan amendment, and zoning amendment contemplated by this Agreement.

"Infrastructure Plan" means a collection of documents that fully describe the public and private infrastructure, on and off the Property, necessary to support the adopted Land Plan and the proposed method(s) of financing construction of the public infrastructure included therein, including, but not limited to, grading plans, drainage studies, sanitary sewer studies, traffic studies, and utility improvement plans.

"Land Plan" means a collection of documents that fully describe the physical characteristics of the Property and the permitted uses of the Property, including, but not limited to, a detailed description and depiction of the permitted uses and associated densities, intensities and locations within the Project; physical characteristics of the Property such as floodplain, slope and soil, Slope Analysis, the availability and accessibility of water that meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the Project, the availability and accessibility of utilities, the availability and accessibility of public services, the availability and accessibility of water and services for fire protection, prevention and containment, and the effect of the Project on existing public streets. attached to this Agreement as Exhibit C.

"Master Developer" means QK, LLC, a Nevada Limited Liability Corporation, and its successors and assigns as permitted by the terms of this Agreement.

"Nonconforming Entitlement Request" means a request by Master Developer or its authorized designee for any amendment to this Agreement, Land Plan amendment, master plan amendment, or zoning amendment, or an application for a Subdivision Map which, when evaluated in conjunction with all existing Entitlements and potential future development in the Project, proposes a total number of units which will result in the Project having less than the minimum or more than the maximum number of permitted units set forth in Section 3.1 at Project build out.

"Owner" means Jackling Aggregates, LLC, a Nevada Limited Liability Corporation, the entity that holds title to the real property described by Exhibit A, and its successors and assigns as permitted by the terms of this Agreement.

"Party," when used in the singular form, means either Owner, Master Developer, or City, and in the plural form of "Parties" means Master Developer, Owner, and City.

"Project" means the Property and any and all improvements provided for or constructed thereupon.

"Property" means that certain 386.87 gross acres of real property that are the subject of this Agreement as described in Exhibit A.

"Slope Analysis" means a slope or cell map that groups small areas of similar slope together, gridded at a maximum contour interval of 2 feet. The Slope Analysis shall depict the following slope categories and may depict additional subcategories within said categories: 0-15%, 16-25%, 26-30%, and 30% or greater.

"Subdivision Map" means any instrument under the Nevada Revised Statutes and the Code that legally subdivides property or gives the right to legally subdivide property.

"Term" means the temporal duration of this Agreement.

SECTION TWO
APPLICABLE RULES AND CONFLICTING LAWS

2.1 Reliance on the Applicable Rules

City and Master Developer agree that Master Developer will be permitted to carry out and complete the development of the Project in accordance with the terms of this Agreement, the Land Plan, the Infrastructure Plan, and the Applicable Rules. The terms of this Agreement shall supersede any conflicting provision of the Code except as provided in Section 2.2 below.

2.2 Application of Subsequently Enacted Rules by the City

The City shall not amend, alter or change any Applicable Rule as applied to the development of the Project, or apply a new fee, rule, regulation, resolution, policy or ordinance to the development of the Project, except as follows:

(a) The development of the Project shall be subject to the Building Codes and Fire Codes in effect at the time of issuance of the permit for the particular development activity.

(b) The application of a new uniformly applied rule, regulation, resolution, policy or ordinance to the development of the Project is permitted, provided that such action is necessary to protect the health, safety and welfare of City residents, does not reduce the permitted density or land use types, does not prevent the type of units or number of permitted units in the Project as set forth in this Agreement, and is consistent with the efficient development and preservation of the entire Project.

(c) Nothing in this Agreement shall preclude the application to the Project of new or changed rules, regulations, policies, resolutions or ordinances specifically mandated and required by changes in state or federal laws or regulations necessary to protect the health, safety and welfare of City residents. In such event, the provisions of Sections 2.4 and 2.5 of this Agreement are applicable.

(d) Should the City adopt or amend rules, regulations, policies, resolutions or ordinances and apply such rules to the development of the Project, other than pursuant to one of the above Sections 2.2(a), 2.2(b) or 2.2(c), the Master Developer shall have the option, in its sole discretion, of accepting or rejecting such new or amended rules by giving written notice of such acceptance or rejection within 90 days of the application of such new or amended rules to the Project. If accepted, City and the Master Developer shall subsequently execute an amendment to this Agreement evidencing the Master Developer's acceptance of the new or amended ordinance, rule, regulation or policy within a reasonable time. If rejected, the new or amended rules will not apply to the Project. Master Developer's failure to accept or reject new or amended rules within 90 days constitutes acceptance of the new or amended rules for that instance.

2.3 Application of New Fees

Notwithstanding Section 2.2 above, City may increase existing cost-based processing fees, entitlement processing fees, Entitlement Request fees, inspection fees, plan review fees, facility fees, or sewer connection fees that uniformly apply to all or similarly situated development in City.

2.4 Conflicting Federal or State Rules

In the event that any federal or state laws or regulations prevent or preclude compliance by City or Master Developer with one or more provisions of this Agreement or require changes to any

approval given by City, this Agreement shall remain in full force and effect as to those provisions not affected, and:

(a) Notice of Conflict. A Party, upon learning of any such matter, will provide the other Parties with written notice of the conflicting laws or regulations and provide a copy of any such law, rule, regulation or policy together with a statement of how any such matter conflicts with the provisions of this Agreement; and

(b) Modification Conferences. The Parties shall, within thirty (30) calendar days of the notice referred to in the preceding subsection, meet and confer in good faith and attempt to modify this Agreement to bring it into compliance with any such federal or state law, rule, regulation or policy.

2.5 City Council Hearings

In the event a Party believes that an amendment to this Agreement is necessary due to the effect of any federal or state law, rule, regulation or policy, the proposed amendment shall be scheduled for hearing before the City Council. The City Council shall determine the exact nature of the amendment necessitated by such federal or state law or regulation. Master Developer shall have the right to offer oral and written testimony at the hearing and may support or oppose such change. Any amendment ordered by the City Council pursuant to a hearing contemplated by this Section is subject to judicial review, but such review shall be filed within twenty-five (25) calendar days from the date of the hearing.

SECTION THREE
PLANNING AND DEVELOPMENT OF THE PROJECT

3.1 Permitted Uses and Density

Subject to all the terms and conditions of this Agreement, Master Developer agrees to build the Project described by Exhibit C subject to the design standards adopted in the Code and as follows:

(a) Number of Units Permitted: 1200-1800 units
(b) Permitted Residential Unit Types: Single Family Detached/Attached
(c) Permitted Commercial Uses: Those uses permitted in the C2 zoning district by Title 20 of the Sparks Municipal Code will be permitted in the portion of the Property with the C2 zoning designation. All conditions and regulations applicable to C2 uses set forth in Title 20 of the Code apply to such uses upon the Property. If any part of the Property is developed for multi-family residential use, the multi-family dwelling units shall be counted toward the number of units permitted in the Project.
(d) Gross Density: A minimum of 3.1 to a maximum of 4.6 du/acre
(e) Minimum Reservation of Open Space: 100 Acres

3.2 Required Infrastructure Improvements

Subject to all the terms and conditions of this Agreement, Master Developer agrees to construct all infrastructure necessary to support the Project as described in Exhibit E. Master Developer further agrees to install, at Master Developer's expense, off-site infrastructure necessary to provide services to the Project, including without limitation:

(a) Sanitary sewer conveyance upgrades that are necessary based on the increased flows resulting from the anticipated land use changes resulting in a residential unit count that would generate sewage volumes 200% to 300% greater than attributed to the site in the sewer model; and

(b) Improvements to public streets, sidewalks, curbs, and gutters that are necessary based on the increased traffic resulting from the anticipated land use changes in the Project. This includes but is not limited to off-site improvements to Highland Ranch Parkway and to the intersection of Highland Ranch Parkway and Pyramid Highway as follows:

(i) Prior to issuance of any building permits for structures, the widening to four travel lanes of Highland Ranch Parkway from Pyramid Highway to the entrance to the Project.

(ii) Prior to or concurrently with submitting an application for a tentative map and/or for multi-family residential units exceeding, in aggregate, 650 dwelling units, the Master Developer shall submit an encroachment permit application to the Nevada Department of Transportation to complete all improvements to the intersection of Highland Ranch Parkway and Pyramid Highway recommended in the The Quarry Traffic Study dated September (25), 2017, with an addendum dated March 12, 2018, and prepared by Solaegui Engineers, incorporated by reference herein as part of the Infrastructure Plan attached hereto as Exhibit E. All improvements from the entrance to the Project to the intersection of Highland Ranch Parkway and Pyramid Highway shall be completed prior to issuance of any certificate of occupany for or final inspection of any dwelling unit in excess of 650 dwelling units in the Project.

(c) Flood control and drainage improvements that are necessary based on the anticipated land use changes in the Project.

(i) If the Property is included in Impact Fee Service Area Number 1, the City will consider for inclusion in the Impact Fee Service Area Number 1 Capital Improvements Plan any flood control and drainage improvements that have regional impacts as illustrated by a hydrology study to be completed at Master Developer's expense. The Parties agree that nothing contained in this Agreement constitutes in any way a pre-approval or authorization of the Property's participation in Impact Fee Service Area Number 1 or a pre-

approval or authorization for inclusion of any flood control or drainage improvements in the Impact Fee Service Area Number 1 Capital Improvements Plan.

(ii) Master Developer shall design and construct all flood control and drainage improvements, whether onsite or off-site, required to comply with the Truckee Meadows Regional Drainage Manual and the approval of the Administrator. Design rainfall depths shall utilize the 24-hour point precipitation frequency estimates from the National Oceanic and Atmospheric Administration Atlas 14 (NOAA Atlas 14).

(d) Public safety conditions and improvements that are necessary based on the anticipated land use changes in the Project, including, without limitation:

(i) Construction of a second fire apparatus access road. The primary median-divided access road to the Project shall serve as dual access for the development of Villages 1 and 2 and shall be extended to the first entrances of Villages 3 and 4. A private, gated secondary fire apparatus access road shall be required with the development of the remainder of the project. Construction of the secondary fire apparatus access road shall be completed prior to issuance of a certificate of occupancy for and/or final inspection of any dwelling unit in excess of 200 dwelling units in the Project. The secondary fire apparatus access road shall be a minimum of twenty (20) feet wide and emergency pull-out areas shall be constructed upon this secondary fire apparatus access road to the approval of the Fire Chief and the City Engineer.The Parties acknowledge and agree that nothing contained in this Agreement constitutes in any way a pre-approval or acceptance of dedication of any streets, gutters, curbs, or sidewalks on the Property.

(ii) Construction of all streets and the secondary fire apparatus access road shall comply with design requirements set forth in the City of Sparks Site Development Fire Prevention Policy Guide and shall be to the approval of the Fire Chief. The street providing primary access to the Project shall be a four lane, median-divided roadway from Highland Ranch Parkway to the first entrances of Villages 3 and 4.Emergency median cross-overs shall be constructed to the approval of the Fire Chief every 750 feet or more frequently. Fire hydrants shall be installed upon the primary access street at distances to be approved by the Fire Chief. Any cul-de-sac constructed within the Project shall have a radius of at least fifty (feet) and a diameter of at least one hundred (100) feet.

(iii) All dwelling units and commercial structures intended or used for human occupancy shall be equipped with fire suppression systems to the approval of the Fire Chief.

(iv) Emergency access points shall be provided to all common areas. These emergency access points shall be a minimum of sixteen (16) feet wide, shall be gated, and shall be posted with signs indicating that parking is prohibited to the approval of the Fire Chief. Design and location of the emergency access points shall be addressed with the appropriate tentative map submittals.

All infrastructure, whether onsite or off-site, shall be constructed in substantial conformance with:

(a) Applicable construction standards;
(b) Design standards required for dedication to the City of Sparks, if applicable; and
(c) Approval of the Administrator.

3.3 Slope Analysis and Development Constraints

Master Developer acknowledges that the development of the Property is constrained by the steep slopes naturally occurring on the Property. In developing the Property, Master Developer shall satisfy all requirements of the Code governing slopes, hilltops, and ridges, including but not limited to Sparks Municipal Code Section 20.04.011. Specifically, Master Developer shall:

(a) Obtain a conditional use permit prior to any clearing, grading, or other disturbance of the soils on the Property and prior to the approval of a tentative map as required by Sparks Municipal Code Section 20.04.011 and Appendices A7 and A8; and

(b) Limit the total area of the Property to be cleared, graded, or otherwise disturbed to 225 acres. With the recordation of each final subdivision map, the Master Developer shall convey the lands designated as open space to the entity responsible for maintenance of the lands designated as open space.

3.4 Fiscal Analysis Revision

Prior to submitting any Nonconforming Entitlement Request for consideration, Master Developer agrees to update the comprehensive Fiscal Analysis of the Project attached hereto as Exhibit D to include any new or amended elements of the Project contemplated by the associated Nonconforming Entitlement Request. Upon approval of the respective Nonconforming Entitlement Request, the updated Fiscal Analysis shall be incorporated into this Agreement as an addendum to Exhibit D. So long as the Project is being developed in accordance with the Land Plan, the Infrastructure Plan, and this Agreement, no revisions or update to the Fiscal Analysis shall be required, including in connection with an Entitlement Request.

3.5 Entitlement Requests

(a) City shall reasonably cooperate with Master Developer to:

(i) Expeditiously process all Entitlement Requests in connection with the Property that are in compliance with the Applicable Rules, Land Plan, and Infrastructure Plan; and

(ii) Promptly consider the approval of Entitlement Requests, subject to reasonable conditions not otherwise in conflict with the Applicable Rules, Land Plan, or the Infrastructure Plan.

(b) Annexation Required. The Parties acknowledge and agree that the Property must be annexed by the City of Sparks before the Project may be developed as described herein. Master Developer has submitted an Annexation Application in accordance herewith as Case No. PCN17-0050 (AX16-0003), and the terms and conditions of any approval of such application shall be deemed in conformance with and incorporated by reference as part of the Land Plan and Infrastructure Plan.

(c) Master Plan Amendment. The Parties acknowledge and agree that the Property's existing and equivalent land use designation must be amended to allow for the development of the uses and densities provided for herein. Master Developer has submitted a Master Plan Amendment in accordance herewith as Case No. PCN17-0050 (MPA 17-0005) and the terms and conditions of any approval of such application shall be deemed in conformance with and incorporated by reference as part of the Land Plan and Infrastructure Plan.

(d) Required Zoning Entitlement for Property. The Parties acknowledge and agree that the proper means to legally entitle the Property for eventual development is by rezoning the Property to allow for the development of the uses and densities provided for herein. Master Developer has submitted a proposed zone change in accordance herewith as Case No. PCN17-0050 (RZ17-0006), and the terms and conditions of any approval of such application shall be deemed in conformance with and incorporated by reference as part of the Land Plan and Infrastructure Plan.

(e) Concurrent Processing of Initial Entitlement Requests. The Parties agree that the most efficient and expeditious manner in which to process the Entitlement Requests described in Section 3.04(b)-(d) is to consolidate final approval of all of the respective Entitlement Requests at a single meeting of the City Council. The City agrees to process the Entitlement Requests described in Section 3.5(b)-(d) concurrently in order to present them to the Sparks Planning Commission and the City Council as a single set. The Master Developer agrees to waive any statutory or Code requirements related to limitations of time for processing individual Entitlement Requests in order to facilitate final action on the entitlements described in Section 3.5(b)-(d) at single meetings of the Planning Commission and City Council. This waiver is intended to allow the Truckee Meadows Regional Planning Agency to review any master plan amendments or projects of regional significance associated with the development of the Project in the period before or between consideration by the Sparks Planning Commission and the City Council.

(f) Other Entitlement Requests. Except as provided herein, all other Entitlement Request applications shall be processed by City according to the Applicable Rules. The Parties acknowledge that the procedures for processing such Entitlement Request applications are governed by the Code. In addition, any additional application requirements delineated herein shall be supplemental and in addition to such Code requirements. The Parties acknowledge and agree that nothing contained in this Agreement constitutes in any way a pre-approval or authorization of any Entitlement Request.

3.6 Modification or Amendment of the Agreement

This Agreement may not be modified or amended, except by the mutual written agreement of the Parties.

3.7 Deviation from Design Standards

Any request for variance or deviation from a particular requirement of the Code for a particular Development Parcel or lot shall be processed and considered according to the requirements of the Code in effect on the Effective Date, unless otherwise agreed to by Master Developer.

3.8 Anti-Moratorium

The Parties agree that no moratorium or future ordinance, resolution or other land use rule or regulation imposing a limitation on the construction, rate, timing or sequencing of the development of property, including those that affect parcel or subdivision maps, building permits, occupancy permits or other entitlements to use or develop land that are issued or granted by City shall apply to the development of the Project or any portion thereof. Notwithstanding the foregoing, City may adopt ordinances, resolutions or rules or regulations that are necessary to:

(a) Comply with any state or federal laws or regulations as provided by Section 2.4, above;

(b) Alleviate or otherwise contain a legitimate, bona fide harmful and/or noxious use of the Property, in which event the ordinance shall contain the most minimal and least intrusive alternative possible, and shall not, in any event, be imposed arbitrarily; or

(c) Maintain City's compliance with federal and state sewerage, storm water conveyance, storm water discharge, water system, and utility regulations.

3.9 Property Dedications to City

Except as provided herein, any real property (and fixtures thereupon) transferred or dedicated to City or any other public entity shall be free and clear of any mortgages, deeds of trust, liens or other encumbrances.

3.10 Inclusion of Additional Property

The City Council will consider the inclusion of additional property ("Additional Parcels") in the Project by formal amendment of this Agreement provided that:

(a) Each Additional Parcel is contiguous to some portion of the Property or immediately across the street;

(b) Development of each Additional Parcel must conform to this Agreement; and

(c) Master Developer obtains the necessary annexation, zoning, and land use approvals and approval of all necessary technical studies for each Additional Parcel. In no event shall this Agreement be amended to include Additional Parcels without contemporaneously amending Exhibits A through E to reflect the proposed expansion of the Project.

The Parties agree that nothing contained in this Agreement constitutes in any way a pre-approval or authorization of the inclusion of Additional Parcels in the Project.

3.11 Impact Fee Service Area Number 1

By executing this Agreement, Master Developer and Owner hereby petition the City, to include the Property in Impact Fee Service Area Number 1 and agree not to withdraw this petition except as permitted by the termination provisions of this Agreement. The Parties agree that nothing contained in this Agreement constitutes in any way a pre-approval or authorization of the Property's participation in Impact Fee Service Area Number 1.

3.12 Special Improvement District

City agrees to consider and, if appropriate, process and facilitate, with due diligence, any applications made by Master Developer for the creation of a special improvement district. The Parties agree that nothing contained in this Agreement constitutes in any way a pre-approval or authorization of any such special improvement district, and any application to create a special improvement district must be processed and approved in accordance with state law and the Applicable Rules.

SECTION FOUR
REVIEW OF DEVELOPMENT

4.1 Frequency of Review

At City's request, Master Developer shall appear before the City Council to review the Master Developer's compliance with the terms of this Agreement pursuant to NRS 278.0205. The Parties agree that the first review shall occur no later than twelve (12) months after the Effective Date of this Agreement, and Master Developer shall provide an updated report every twenty-four (24)

months on the anniversary date of that first review thereafter, or as otherwise requested by City upon thirty (30) days' written notice to Master Developer. For any such review, Master Developer shall provide, and City shall review, a report submitted by Master Developer documenting the extent of Master Developer's and City's material compliance with the terms of this Agreement during the preceding reporting period. The report shall contain information regarding the progress of development within the Project, including, without limitation:

(a) Data showing the total number of units built and approved on the date of the report;

(b) Specific densities within each subdivision and within the Project as a whole; and

(c) The status of development within the Project and the anticipated phases of development for the next calendar year.

In the event Master Developer fails to submit such a report within thirty (30) days following written notice from City that the deadline for such a report has passed, Master Developer shall be in default of this provision and City shall prepare such a report and conduct the required review in such form and manner as City may determine in its sole discretion. City shall charge Master Developer for its reasonable expenses, fees, and costs incurred in conducting such review and preparing such report. If at the time of review an issue not previously identified in writing is required to be addressed, the review may, at the request of either Party, be continued to afford reasonable time for response.

4.2 Opportunity to be Heard

The report required by this Section shall be considered solely by the City Council. Master Developer shall be permitted an opportunity to be heard orally and in writing before the City Council regarding performance of the Parties under this Agreement.

4.3 Action by the City Council

At the conclusion of the public hearing on the review, the City Council may take any action permitted by NRS 278.0205, NRS 278.02053, and/or this Agreement.

SECTION FIVE
DEFAULT

5.1 Material Default; Opportunity to Cure

In the event of any material default of any provision of this Agreement, the Party alleging such noncompliance shall deliver to the other by certified mail a ten (10) day notice of default and opportunity to cure. The time of notice shall be measured from the date of receipt of the certified mailing. The notice of noncompliance shall specify the nature of the alleged noncompliance and the manner in which it may be satisfactorily corrected, during which ten (10) day period the party alleged to be in noncompliance shall not be considered in default for the purposes of termination or institution of legal proceedings.

If the material default cannot reasonably be cured within the ten (10) day cure period, the defaulting Party may timely cure the material default for purposes of this Section if it commences the appropriate remedial action within the ten (10) day cure period and thereafter diligently prosecutes such action to completion within a period of time acceptable to the non-breaching Party. If no agreement between the Parties is reached regarding the appropriate timeframe for remedial action, the cure period shall not be longer than ninety (90) days from the date on which the ten (10) day notice of material default and opportunity to cure was received by the defaulting Party.

If the material default is corrected, then no default shall exist and the noticing Party shall take no further action. If the material default is not corrected within the relevant cure period, the defaulting Party is in default, and the Party alleging material default may elect any one or more of the following courses.

(a) Amendment or Termination by City. After proper notice and the expiration of the above-referenced period for Master Developer to correct the alleged material default, the City may give notice of intent to amend or terminate this Agreement as authorized by NRS Chapter 278. Following any such notice of intent to amend or terminate, the matter shall be scheduled and noticed as required by law for consideration and review solely by the City Council. Following consideration of the evidence presented before the City Council and a finding that a material default has occurred by Master Developer and remains uncured, City may amend or terminate this Agreement. Termination shall not in any manner rescind, modify, or terminate any Entitlement held in the Project and/or in favor of Master Developer, as determined under the Applicable Rules, existing or received as of the date of the termination. Master Developer shall have twenty-five (25) days after receipt of written notice of termination to institute legal action pursuant to this Section to determine whether a material default existed and whether City was entitled to terminate this Agreement.

(b) Termination by Master Developer. In the event City materially defaults under this Agreement, Master Developer shall have the right to terminate this Agreement after providing notice and an opportunity to cure as set forth in this Section. Master Developer shall have the option, in its discretion, to maintain this Agreement in effect, and seek to enforce all of City's obligations by pursuing an action for specific performance or other appropriate judicial remedy.

5.2 Force Majeure; Unavoidable Delay; Extension of Time

Neither Party hereunder shall be deemed to be in default, and performance shall be excused, where delays or defaults are caused by war, national disasters, terrorist attacks, insurrection, strikes, walkouts, riots, floods, earthquakes, fires, casualties, third-party lawsuits, or acts of God. If written notice of any such delay is given to one Party or the other within thirty (30) days after the commencement thereof, an automatic extension of time, unless otherwise objected to by the Party in receipt of the notice within thirty (30) days of such written notice, shall be granted coextensive with the period of the enforced delay, or longer as may be required by circumstances or as may be subsequently agreed to between City and Master Developer.

5.3 Limitation on Monetary Damages

The Parties agree that they would not have entered into this Agreement if either were to be liable for monetary damages based upon a breach of this Agreement or any other allegation or cause of action based upon or with respect to this Agreement. Accordingly, the Parties (or their permitted assigns) may pursue any course of action at law or in equity available for breach of contract, except that neither Party shall be liable to the other or to any other person or entity for any monetary damages based upon a breach of this Agreement or any other allegation or cause of action based upon or with respect to this Agreement.

5.4 Venue

Jurisdiction for judicial review under this Agreement shall rest exclusively with the Second Judicial District Court, County of Washoe, State of Nevada or the United States District Court, District of Nevada. The Parties agree to mediate any and all disputes prior to filing of an action in court unless seeking injunctive relief.

5.5 Waiver

Failure or delay in giving notice of default shall not constitute a waiver of any default. Except as otherwise expressly provided in this Agreement, any failure or delay by any Party in asserting any of its rights or remedies in respect of any default shall not operate as a waiver of any default or any such rights or remedies, or deprive such Party of its right to institute and maintain any actions or proceedings that it may deem necessary to protect, assert, or enforce any of its rights or remedies.

5.6 Applicable Laws; Attorney Fees

This Agreement shall be construed and enforced in accordance with the laws of the State of Nevada. Each Party shall bear its own attorney fees and court costs in connection with any legal proceeding hereunder, and in no event shall any prevailing Party in such a legal proceeding be entitled to an award of attorney fees.

SECTION SIX
GENERAL PROVISIONS

6.1 Duration of Agreement

The Term of this Agreement shall commence upon the Effective Date and shall expire on the fifteenth (15) anniversary of the Effective Date, unless terminated earlier pursuant to the terms hereof. Master Developer shall have the right to request one extension of the Term of this Agreement for an additional five (5) years upon the following conditions:

(a) Master Developer provides written notice of such extension to City at least one hundred-eighty (180) days prior to the expiration of the original Term of this Agreement;

(b) Master Developer is not in default of this Agreement;

(c) The City Council finds that an extension is in the best interests of the City; and

(d) Master Developer and City enter into an amendment to this Agreement memorializing the extension of the Term.

6.2 Expiration of the Agreement

Expiration of the Agreement Term pursuant to Section 6.1 shall not in any manner rescind, modify, or terminate any Entitlement in the Project and/or in favor of Master Developer, as determined under the Applicable Rules, existing or received as of the date of the expiration, and future development of any other portion of the Project not holding such Entitlements shall be subject to all applicable Codes in effect at the time of development. The Parties agree that, in the event of such expiration, the Master Developer shall consent to the City reverting the land use and/or zoning designations on any undeveloped portion of the Property back to the respective land use and/or zoning designations applicable to such undeveloped portion of the Property on the Effective Date of this Agreement.

6.3 Assignment

The Parties acknowledge that the intent of this Agreement is that there is a master developer responsible for all of the obligations in this Agreement throughout the Term of this Agreement. At any time during the Term, Master Developer may sell, assign or transfer all or any portion of its rights, title and interests in the Property, Project (including rights to develop such property in accordance with this Agreement), and this Agreement to any person or entity for development, so long as Master Developer remains, or a successor master developer has assumed through a written assignment and assumption agreement provided to the City, and is obligated and responsible as master developer of the Project for:

(a) Performance under this Agreement;

(b) Completion of backbone infrastructure for the Project; and

(c) Completion of common areas through dedication and acceptance by a common interest community or limited purpose association under NRS Chapter 116.

6.4 Indemnity; Hold Harmless

Except as expressly provided in this Agreement, the Master Developer shall hold City, its officers, agents, employees, and representatives harmless from liability for damage or claims for damage for personal injury including death and claims for property damage which may arise from the direct

or indirect operations of Master Developer or those of its contractors, subcontractors, agents, employees, or other persons acting on Master Developer's behalf that relate to the development of the Project. Master Developer agrees to and shall defend City and its officers, agents, employees, and representatives from actions for damages caused or alleged to have been caused by reason of Master Developer's activities in connection with the development of the Project other than any challenges to the validly of this Agreement or City's approval of related entitlements. Master Developer and City agree to equally pay all costs and attorney fees for a defense in any legal action filed in a court of competent jurisdiction by a third party alleging any such claims or challenging the validity of this Agreement. The provisions of this Section shall not apply to the extent such damage, liability, or claim is proximately caused by the intentional or negligent act of City, its officers, agents, employees, or representatives. This Section shall survive any termination of this Agreement.

6.5 Binding Effect of Agreement

Subject to this Agreement, the burdens of this Agreement bind, and the benefits of this Agreement inure to, the Parties' respective assigns and successors-in-interest and the Property that is the subject of this Agreement.

6.6 Relationship of Parties

It is understood that the contractual relationship between City and Master Developer is such that Master Developer is not an agent of City for any purpose and City is not an agent of Master Developer for any purpose.

6.7 Counterparts

This Agreement may be executed at different times and in multiple counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Any signature page of this Agreement may be detached from any counterpart without impairing the legal effect to any signatures thereon, and may be attached to another counterpart, identical in form thereto, but having attached to it one or more additional signature pages.

Delivery of a counterpart by facsimile or portable document format (pdf) through electronic mail transmission shall be as binding an execution and delivery of this Agreement by such Party as if the Party had delivered an actual physical original of this Agreement with an ink signature from such Party. Any Party delivering by facsimile or electronic mail transmission shall promptly thereafter deliver an executed counterpart original hereof to the other Party.

6.8 Notices

All notices, demands and correspondence required or provided for under this Agreement shall be in writing. Delivery may be accomplished in person, by certified mail (postage prepaid return receipt requested), or via electronic mail transmission. Mail notices shall be addressed as follows:

To City:	City of Sparks Attention: City Manager 431 Prater Way Sparks, Nevada 89431
To Owner:	Jackling Aggregates, LLC Attention: Kristi Giudici 1475 E. Greg Street, Suite A Sparks, Nevada 89431
To Master Developer:	QK, LLC Attention: Blake Smith l East Liberty, Suite 444 Reno, Nevada 89501

Any Party may change its address by giving notice in writing to the others and thereafter notices, demands and other correspondence shall be addressed and transmitted to the new address.

Notices given in the manner described shall be deemed delivered on the day of personal delivery or the date delivery of mail is first attempted.

6.9 Entire Agreement

This Agreement constitutes the entire understanding and agreement of the Parties. This Agreement integrates all of the terms and conditions mentioned herein or incidental hereto and supersedes all negotiations or previous agreements between the Parties with respect to all or any part of the subject matter hereof.

6.10 Waiver

All waivers of the provisions of this Agreement shall be in writing and signed by the appropriate officers of Master Developer or approved by the City Council, as the case may be.

6.11 Recording; Amendments

Promptly after execution hereof, an executed original of this Agreement shall be recorded in the Official Records of Washoe County, Nevada. All amendments hereto must be in writing signed by the appropriate officers of City and Master Developer in a form suitable for recordation in the Official Records of Washoe County, Nevada. Upon completion of the performance of this Agreement, a statement evidencing said completion shall be signed by the appropriate officers of the City and Master Developer and shall be recorded in the Official Records of Washoe County, Nevada. A revocation or termination shall be signed by the appropriate officers of the City or Master Developer and shall be recorded in the Official Records of Washoe County, Nevada.

6.12 Headings; Exhibits; Cross References

The recitals, headings and captions used in this Agreement are for convenience and ease of reference only and shall not be used to construe, interpret, expand or limit the terms of this Agreement. All exhibits attached to this Agreement are incorporated herein by the references contained herein. Any term used in an exhibit hereto shall have the same meaning as in this Agreement unless otherwise defined in such exhibit. All references in this Agreement to sections and exhibits shall be to sections and exhibits to this Agreement, unless otherwise specified.

6.13 Severability of Terms

If any term or other provision of this Agreement is held to be invalid, illegal or incapable of being enforced by any rule of law or public policy, all other conditions and provisions of this Agreement shall nevertheless remain in full force and effect, provided that the invalidity, illegality or unenforceability of such terms does not materially impair the Parties' ability to consummate the transactions contemplated hereby. If any term or other provision is invalid, illegal or incapable of being enforced, the Parties hereto shall, if possible, amend this Agreement so as to affect the original intention of the Parties.

6.14 Exercise of Discretion

Wherever a Party to this Agreement has discretion to make a decision, it shall be required that such discretion be exercised reasonably unless otherwise explicitly provided in the particular instance that such decision may be made in the Party's "sole" or "absolute" discretion or where otherwise allowed by applicable law.

6.15 No Third-Party Beneficiary

This Agreement is intended to be for the exclusive benefit of the Parties hereto and their permitted assignees, if any. No third-party beneficiary to this Agreement is contemplated and none shall be construed or inferred from the terms hereof. In particular, no person purchasing or acquiring title to land within the Project, residing in the Project, or residing outside the Project shall, as a result of such purchase, acquisition or residence, have any right to enforce any obligation of Master Developer or City nor any right or cause of action for any alleged breach of any obligation hereunder by any Party hereto.

6.16 Gender Neutral

In this Agreement (unless the context requires otherwise), the masculine, feminine and neutral genders and the singular and the plural include one another.

[Signatures on following pages]

IN WITNESS WHEREOF, this Agreement has been executed by the Parties on the day and year first above written.

CITY OF SPARKS, a municipal corporation of the State of Nevada

By: _____
Geno Martini, Mayor

ATTEST:

By: _____
Teresa Gardner, City Clerk

APPROVED AS TO FORM

By: _____
Chester H. Adams, City Attorney

JACKLING AGGREGATES, LLC, a Nevada Limited Liability Company

By: _____

QK, LLC, a Nevada Limited Liability Company

By: _____

STATE OF _____)
) ss.
COUNTY OF _____)

This instrument was acknowledged before me this _____ day of _____, 2018, by _____.

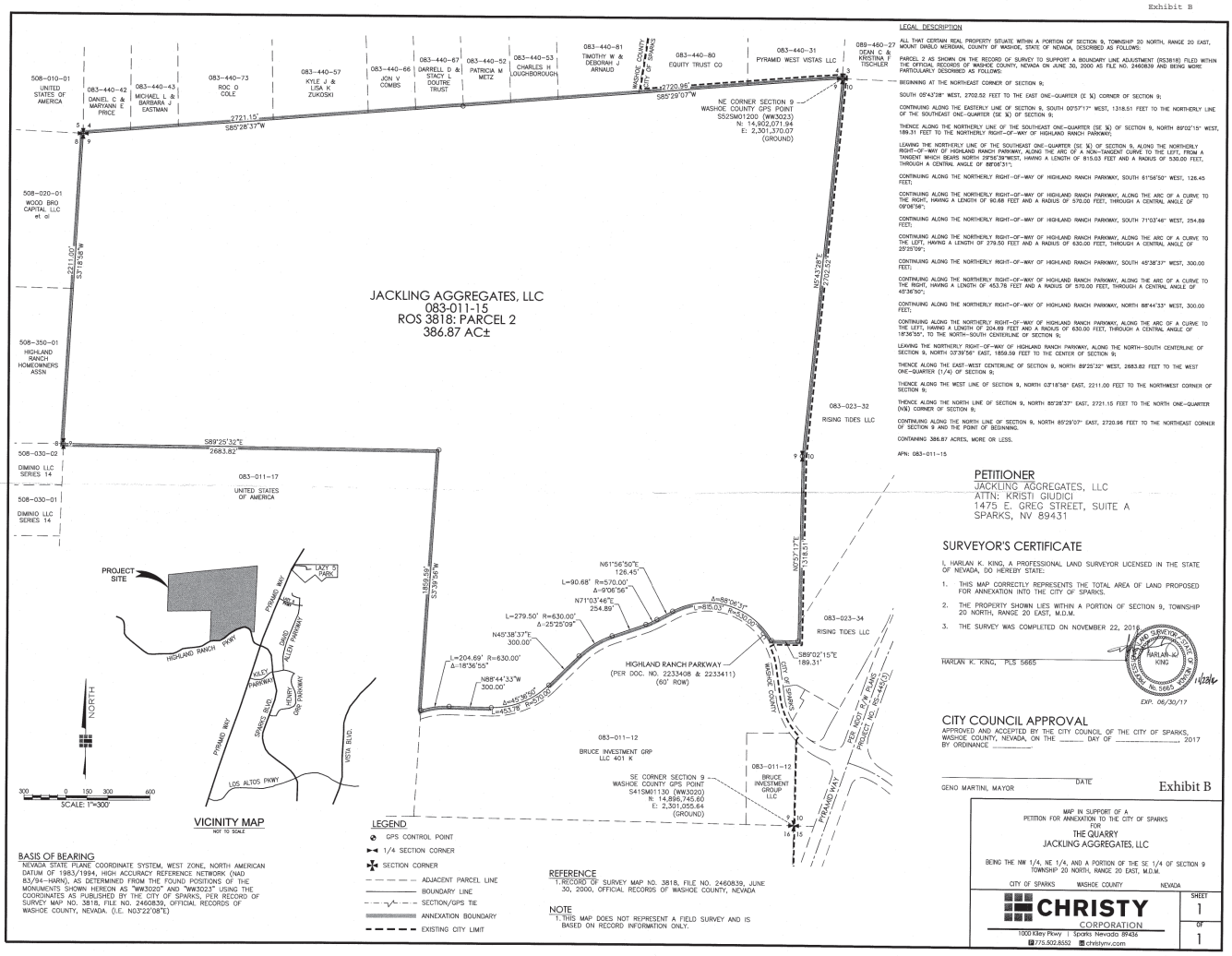
_____
Notary Public

STATE OF _____)
) ss.
COUNTY OF _____)

This instrument was acknowledged before me this _____ day of _____, 2018, by _____.

_____
Notary Public

Exhibit B



VICINITY MAP
NOT TO SCALE

LEGAL DESCRIPTION

ALL THAT CERTAIN REAL PROPERTY SITUATE WITHIN A PORTION OF SECTION 9, TOWNSHIP 20 NORTH, RANGE 20 EAST, MOUNT DIABLO MERIDIAN, COUNTY OF WASHOE, STATE OF NEVADA, DESCRIBED AS FOLLOWS:

PARCEL 2 AS SHOWN ON THE RECORD OF SURVEY TO SUPPORT A BOUNDARY LINE ADJUSTMENT (RS3818) FILED WITHIN THE OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA ON JUNE 30, 2000 AS FILE NO. 2460839 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF SECTION 9;

SOUTH 05°43'28" WEST, 2702.52 FEET TO THE EAST ONE-QUARTER (E ¼) CORNER OF SECTION 9;

CONTINUING ALONG THE EASTERLY LINE OF SECTION 9, SOUTH 00°57'17" WEST, 1318.51 FEET TO THE NORTHERLY LINE OF THE SOUTHEAST ONE-QUARTER (SE ¼) OF SECTION 9;

THENCE ALONG THE NORTHERLY LINE OF THE SOUTHEAST ONE-QUARTER (SE ¼) OF SECTION 9, NORTH 89°02'15" WEST, 189.31 FEET TO THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY;

LEAVING THE NORTHERLY LINE OF THE SOUTHEAST ONE-QUARTER (SE ¼) OF SECTION 9, ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, FROM A TANGENT WHICH BEARS NORTH 39°56'39"WEST, HAVING A LENGTH OF 815.03 FEET AND A RADIUS OF 530.00 FEET, THROUGH A CENTRAL ANGLE OF 88°06'31";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, SOUTH 61°56'50" WEST, 126.45 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A LENGTH OF 90.68 FEET AND A RADIUS OF 570.00 FEET, THROUGH A CENTRAL ANGLE OF 09°06'56";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, SOUTH 71°03'46" WEST, 254.89 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A LENGTH OF 279.50 FEET AND A RADIUS OF 630.00 FEET, THROUGH A CENTRAL ANGLE OF 25°25'09";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, SOUTH 45°38'37" WEST, 300.00 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A LENGTH OF 453.78 FEET AND A RADIUS OF 570.00 FEET, THROUGH A CENTRAL ANGLE OF 45°36'40";

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, NORTH 88°44'33" WEST, 300.00 FEET;

CONTINUING ALONG THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A LENGTH OF 204.69 FEET AND A RADIUS OF 630.00 FEET, THROUGH A CENTRAL ANGLE OF 18°36'55", TO THE NORTH-SOUTH CENTERLINE OF SECTION 9;

LEAVING THE NORTHERLY RIGHT-OF-WAY OF HIGHLAND RANCH PARKWAY, ALONG THE NORTH-SOUTH CENTERLINE OF SECTION 9, NORTH 03°39'56" EAST, 1859.59 FEET TO THE CENTER OF SECTION 9;

THENCE ALONG THE EAST-WEST CENTERLINE OF SECTION 9, NORTH 89°25'32" WEST, 2683.82 FEET TO THE WEST ONE-QUARTER (1/4) OF SECTION 9;

THENCE ALONG THE WEST LINE OF SECTION 9, NORTH 03°18'58" EAST, 2211.00 FEET TO THE NORTHWEST CORNER OF SECTION 9;

THENCE ALONG THE NORTH LINE OF SECTION 9, NORTH 85°28'37" EAST, 2721.15 FEET TO THE NORTH ONE-QUARTER (N¼) CORNER OF SECTION 9;

CONTINUING ALONG THE NORTH LINE OF SECTION 9, NORTH 85°29'07" EAST, 2720.96 FEET TO THE NORTHEAST CORNER OF SECTION 9 AND THE POINT OF BEGINNING.

CONTAINING 386.87 ACRES, MORE OR LESS.

APN: 083-011-15

PETITIONER
JACKLING AGGREGATES, LLC
ATTN: KRISTI GIUDICI
1475 E. GREG STREET, SUITE A
SPARKS, NV 89431

SURVEYOR'S CERTIFICATE

I, HARLAN K. KING, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF NEVADA, DO HEREBY STATE:

1. THIS MAP CORRECTLY REPRESENTS THE TOTAL AREA OF LAND PROPOSED FOR ANNEXATION INTO THE CITY OF SPARKS.
2. THE PROPERTY SHOWN LIES WITHIN A PORTION OF SECTION 9, TOWNSHIP 20 NORTH, RANGE 20 EAST, M.D.M.
3. THE SURVEY WAS COMPLETED ON NOVEMBER 22, 2016.

HARLAN K. KING, PLS 5665

EXP. 06/30/17

CITY COUNCIL APPROVAL

APPROVED AND ACCEPTED BY THE CITY COUNCIL OF THE CITY OF SPARKS, WASHOE COUNTY, NEVADA, ON THE _____ DAY OF _____, 2017 BY ORDINANCE _____.

_____ DATE
GENO MARTINI, MAYOR

Exhibit B

MAP IN SUPPORT OF A PETITION FOR ANNEXATION TO THE CITY OF SPARKS FOR
THE QUARRY
JACKLING AGGREGATES, LLC

BEING THE NW 1/4, NE 1/4, AND A PORTION OF THE SE 1/4 OF SECTION 9 TOWNSHIP 20 NORTH, RANGE 20 EAST, M.D.M.

CITY OF SPARKS WASHOE COUNTY NEVADA

CHRISTY CORPORATION
1000 Kiley Pkwy | Sparks Nevada 89436
775.502.8552 christynv.com

SHEET 1 OF 1

BASIS OF BEARING
NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE, NORTH AMERICAN DATUM OF 1983/1994, HIGH ACCURACY REFERENCE NETWORK (NAD 83/94-HARN), AS DETERMINED FROM THE FOUND POSITIONS OF THE MONUMENTS SHOWN HEREON AS "WW3020" AND "WW3023" USING THE COORDINATES AS PUBLISHED BY THE CITY OF SPARKS, PER RECORD OF SURVEY MAP NO. 3818, FILE NO. 2460839, OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA. (I.E. N03°22'08"E)

LEGEND
- GPS CONTROL POINT
- 1/4 SECTION CORNER
- SECTION CORNER
- ADJACENT PARCEL LINE
- BOUNDARY LINE
- SECTION/GPS TIE
- ANNEXATION BOUNDARY
- EXISTING CITY LIMIT

REFERENCE
1. RECORD OF SURVEY MAP NO. 3818, FILE NO. 2460839, JUNE 30, 2000, OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA

NOTE
1. THIS MAP DOES NOT REPRESENT A FIELD SURVEY AND IS BASED ON RECORD INFORMATION ONLY.

CITY OF SPARKS, NV
COMMUNITY
SERVICES
DEPARTMENT

To: Mayor and City Council

From: Marilie Smith, Administrative Secretary

Subject: Report of Planning Commission Action

Date: April 13, 2018

RE: PCN16-0050 – Consideration of and possible action, for a site 386.87 acres in size located at 555 Highland Ranch Parkway, Sparks, NV, of requests for:
- DA18-0001 – A Development Agreement between the City of Sparks and Jackling Aggregates, LLC and QK, LLC; (For Possible Action)
- AX16-0003 – Voluntary annexation into the city of Sparks. Upon annexation the parcel shall convert from a Washoe County zoning designation of GR (General Rural) to a City of Sparks zoning designation of A40 (Agriculture); (For Possible Action)
- MPA17-0005 – A Comprehensive Plan land use change from Open Space (OS), Commercial (C) and Employment Center (EC) to Intermediate Density Residential (IDR) and Commercial (C); (For Possible Action) and
- RZ17-0006 – Rezoning of the site from A40 (Agriculture) to SF6 (Single Family Residential – 6,000 square feet lots) and C2 (General Commercial) zoning. (For Possible Action)

Please see the attached excerpt from the April 5, 2018 Planning Commission meeting transcript.

(A break was taken.)

* * * * *

CHAIRMAN VANDERWELL: Okay. I'm going to call the Commission meeting for April 5th back to order.

And we are now going to discuss PCN16-0050, and we're going to start with DA18-0001, to start out.

MR. ORNELAS: Chairman VanderWell and members of the Planning Commission, I am Armando Ornelas, the Community Services Director for the City. If it's okay with the Chairman and the Planning Commission, I'd like to introduce all four of the items that are part of this PCN-0050.

CHAIRMAN VANDERWELL: Yes.

MR. ORNELAS: And then I and Chief Maples, Fire Chief Maples will address the development agreement. And Karen Melby, your Development Services Manager, will address the annexation, Comprehensive Plan amendment, and zoning request. And then we all be available for questions.

CHAIRMAN VANDERWELL: Perfect. So I need to open just for all of them, just open them one at a time?

MS. MCCORMICK: You can just read the top two lines.

CHAIRMAN VANDERWELL: Okay.

MS. MCCORMICK: And the stated four requests.

CHAIRMAN VANDERWELL: Okay.

MR. ORNELAS: Okay. This case involves a property located at 555 Highland Ranch Parkway, which is located just up to the west on Melanie Parkway from the Pyramid Highway. It is outlined, the parcel, the single parcel is outlined in the blue (indistinct).

The property's, again, 387 acres in size. It's a former aggregate mining sect. You can see the impact of that on the sect in the (indistinct). It is largely not visible from either Highland Ranch Parkway or from Pyramid Highway. It's, essentially, once you go up, you're up here, and (indistinct). It is a big access road, as shown here from Mount Ridge Parkway.

And, again, this case, PCN16-0050, is comprised of four requests. The first one is DA18-001, which is the proposed development agreement between the City of Sparks, Jackling Aggregates, LLC, and QK, LLC.

In the instance of the development agreement, the Planning Commission's responsibility is to review it and to make a recommendation as to the City Council regarding whether the development agreement is consistent with the Comprehensive Plan or not. The agreement would have to be approved by the City Council for it to take effect.

The second part of the request is AX16-0003,

which is voluntary annexation into the City of Sparks. Upon annexation, the parcel shall, will convert from a Washoe County zoning designation of General Rural to a City of Sparks zoning designation of A40, or Agriculture. The Planning Commission is responsible for making a recommendation to the City Council on annexation requests.

The third part of this is MPA17-0005, which a Comprehensive Plan land use change request to change its designation from Open Space, Commercial, and Employment Center to Intermediate Density Residential and Commercial. In the case of the Comprehensive Plan request, as we discussed in the past, the Comprehensive Plan is the Planning Commission's domain, by and large. And so it is your responsibility to approve or disapprove this request. And then the City Council will certify the change if you were to approve it.

And then the fourth part is RZ17-0006, which is a request to rezone the site from of A40, which is Agricultural, to SF6, single-family residential 6,000-square-foot lots, and C2, which is General Commercial. And the Planning Commission's role is to make a recommendation on the rezoning to the City Council.

So the reason for bundling the development

agreement with the other three requests, with the annexation, Comp Plan amendment, and the zoning request, is to provide through the Planning Commission, the City Council public and third-party reviewing agencies with an understanding of what's proposed for the site at the time that these requests were being contemplated.

As you may recall, for example, on the 67-acre parcel to the south, on Mount Ridge Parkway, the Planning Commission saw these, the annexation, as planned in the zoning request, really without any basis in terms of anything definitive in terms of what the project would be. And so there was also no ability to condition the approvals.

And so, in this instance, the development agreement is a mechanism for conditions to be attached to the approvals, as would be done, for example, with a plan development handbook. They're different animals, if you will. The development agreement is not intended to be as specific or to address all the details, for example, architectural design standards, that will be addressed in the handbook.

Nevertheless, the development agreement, you know, in this instance includes a land plan. It includes an infrastructure plan. And by addressing those, both uses and the infrastructure requirements,

enables the development agreement to serve as a mechanism for satisfying the so-called concurrency requirement in the regional plan, which calls for or requires infrastructure and public services be addressed at the time that land use entitlements are considered.

So, in terms of what's in the agreement, the agreement's key terms are summarized on pages five and six of the agreement. Section 2 is intended to provide the developer a degree of regulatory predictability in the relation of the build-out of the project. This has a long, long build-out. And so it defines the rules and the fees that apply to development of the project.

Permitted uses and density are addressed in Section 3.1, which specifies that between 1,200 and 1,800 residential units are permitted, which placed a gross density of between 3.1 and 4.6 dwelling units per acre. It allows for single-family detached and attached units in the portion of the property for which SF6 zoning is requested. And then, in the 13 or so acres that where C2 zoning is proposed, all of the uses that are permitted in C2 zoning would be permitted.

The required infrastructure improvements are addressed in Section 3.2. This includes the off-site infrastructure, which is part of the developer's expense for the project. The required off-site improvements

include sanitary sewer upgrades and flood control and drainage improvements.

Also required are the widening of the Highland Ranch Parkway from the entrance to the project to the Pyramid Highway. So, essentially, from the intersection of Pyramid Highway to the entrance of the project, this lane would be required to be expanded to four lanes, four travel lanes prior to the issuance of any building permits for any structures.

And then the development agreement also includes provisions that require that this intersection have certain improvements made to it that are recommended in the traffic study, which is one of the attachments to the staff report that was prepared by Solaegui Engineers. That traffic analysis will be reviewed by both City engineering staff and the Nevada Department of Transportation. And both staff and the NDOT staff concur with those recommendations.

Those are the section improvements that must be completed prior to the issuance of any certificate of occupancy for, or final inspection of any dwelling unit in excess of 650 dwelling units. Stated more simply, prior to the 650 first certificate of occupancy or final inspection, those are permits that have to be made. That means that the developer is going to have to get

started in terms of getting approval from NDOT for those specific improvements well before they need that, right, so that they have that in time.

The idea, again, is to maintain at least a level of service E at that intersection.

Section 3.2 of the agreement also requires, per the determination of the City's Fire Chief, the construction of a second fire apparatus access road prior to the issuance of that 650 first C of 0 or occupancy permit. And as written in the development agreement, the second fire apparatus access road must be open for public use, a condition which Chief Maples will elaborate on following my presentation, and which, I believe, the developer has some concerns about. And it's up to him to address, them to address their concerns about that.

In addition, the development agreement specifies that all dwelling units and commercial structures intended for or to be used for human occupancy must be equipped with fire suppression systems, i.e. (indistinct).

And then, also, in terms of requirements from the fire department that have been incorporated into the development agreement, construction of all streets must comply with the design requirements that are set forth

in the City's site development and fire prevention policy guide to the approval of Fire Chief.

And then Section 3.11 constitutes the developer's and property owner's petition to include the subject property in Impact Fee Service Area Number 1 and, essentially, in the development agreement there is not -- withdraw the petition except as permitted in the agreement.

Section 3.4 of the development agreement limits the total area to be cleared, graded or disturbed to 225 of the 387 acres. So, as Karen will address in her presentation, the entirety of the site is being, or is close to being rezoned and to have its master plan land use designation changed to those that I mentioned. We don't have anything that would be zoned for this as open space or designated as such in our Comprehensive Plan.

However, this agreement is the basis for limiting that 225 of the 387 acres, which equates to about 58 percent of the site. So that means that over 40 percent of the site is supposed to be left as open space. And per the development agreement, the developer's required to convey with each final subdivision map the lands designated as open space to the entity responsible for maintenance of those lands, which would, in all likelihood, be the homeowners

association.

Section 4 permits the City Council to review the developer's compliance with the agreement at 12 months from the effective date. It also requires the developer to report every 24 months after that initial review on the number of units approved and built, development densities, and status of the project.

Section 6.1 specifies the duration of the agreement, which is 15 years. The agreement grants the developer the right to request one five-year extension subject to certain conditions.

So that's what's in the agreement, if you will, in terms of the primary terms.

Before I address the -- you know, how this development agreement is consistent with the Comprehensive Plan, which is, you know, what the Planning Commission proposed to plan on, and that are conditioned to the City Council, Chief Maples has a -- is going to address the provisions in the agreement that apply.

Thank you.

CHIEF MAPLES: Good evening, Commissioners. For the record, my name is Chris Maples, and I'm the Fire Chief for the City of Sparks. I think, this is the first time I've had the opportunity to speak before you.

So I wanted to address you tonight and stress one of my concerns regarding the proposed development. And that is, my primary concern is the limited access to this property. As currently proposed, the development only has a single dedicated public roadway in and out.

The Fire Code gives me the authority to require a secondary means of access for fire department. Beyond that, I'd ask that this access road be open to the public to ensure two ways in and two ways out for both residents and emergency vehicles.

My concern with the fire access road is that it will not receive the same level of maintenance as a city street open for public use. For example, it won't be plowed when it snows.

Additionally, if we can get it and, most importantly, emergency access roads are not typically designed for two-way traffic. While a fire access road may provide a way for fire department vehicles to enter the development, it will not be suitable for the rapid evacuation of residents should the need arise due to some natural or unnatural disaster.

Given the density and topography of the proposed development, my professional opinion is that an additional public access route into and out of the development is not only prudent, but also provides a

much greater degree of safety for the residents.

So to rectify this, I propose that the development agreement be amended to include a secondary access road that would be open to the public to use, rather than designed solely for access by emergency vehicles. And it's my understanding that the developer has asked for this requirement to be removed.

Now, I will say that subsequent to me preparing my statement, I (indistinct) contacted me and offered or suggested some possible alternatives to address my concerns about the limited access to the property. And it was very preliminary, so I'm not prepared to say whether or not those would be acceptable to me at this time, but I'm willing to consider them in the future.

CHAIRMAN VANDERWELL: Thank you.

MR. ORNELAS: Okay. So just to be clear, the development agreement, as presented to you, was for your consideration. It does include those requests of the Fire Department.

So moving on, in terms of the Planning Commission's role with regard to the development agreement's review, development agreement consistency with the Comprehensive Plan, in staff's view, the applicable Comprehensive Plan's goals and policies are MG5, which really has to do with the review of master

plan amendments for sites over five acres and requires the City to evaluate or cause to be evaluated impacts on facilities and services, facilities and infrastructure, the impacts on services, public services, and then the proposed land use in relationship to existing land uses and the fiscal implications.

And in Policy CF1, which says that when reviewing new development, the City will not approve an application unless the City services can be provided at acceptable service levels.

So what we intended to do in the development agreement is to provide the framework for assuring that this project can comply with those requirements of the Comprehensive Plan. So it is staff's view that for that reason, the development agreement itself is consistent with the Comprehensive Plan.

So that concludes my presentation on the development agreement. As I noted earlier, Ms. Melby's going to be going through the annexation, Comp Plan amendment and the zoning request, and then we'll all be available for questions.

CHAIRMAN VANDERWELL: Thank you.

MS. MELBY: Good evening, Planning Commission. I'm Karen Melby, Development Service.

So my first application I'm going to review

with you tonight is annexation. This is the annexation map. They are proposing or requesting or petitioning for to annex 387, approximately 387 acres.

The first, what I wanted to review is the annexation findings, the three findings. Finding A is in conformance to the requirements of NRS 268. This property is contiguous to the City limits and being requested by the property owner, which is in conformance with NRS 268.

The next finding, A2, which is conformance to the findings for annexation, and our Sparks Municipal Code actually consists of 10 findings. So I'm going to review those.

The first one is the location of the property. The property is located north of Highland Ranch Parkway and is contiguous to the City on two sides, and it would be this to the south and then to the east. It is also actually contiguous a tiny bit on the north. Therefore, making that being consistent with the location.

The next one is the logical extension of City limits. This property, again, is contiguous to the City on two sides, and it is within the City Sphere of Influence. And existing utilities are in proximity to the property. Which fits a logical extension of the City limits.

The next one is need for expansion. There is a housing shortage in the region. So this property will increase the single-family housing supply.

D is the location of the existing and planned water and sewer service. Water service will be provided by the Truckee Meadows Water Authority, and sanitary sewer will be provided by the City of Sparks. Sanitary sewer service will be provided to the project via the northwest sanitary sewer interceptor located on the east side of the project, or actually the east side of McCarran and Highland. The developer will be responsible for the construction of all new sanitary sewer lines as well as an upgrade to the existing sanitary sewer line that will connect the project to the northwest connector.

The City sewer system, sanitary sewer model on the maximum unit count is -- maximum unit --

CHAIRMAN VANDERWELL: Okay. It's okay.

MS. MELBY: In the model, we did the model, the sanitary sewer model. We modeled it at the 1,800, even though at the fiscal impact they did it at 12.3. We did do the maximum number and also looked at the 13.4 acres of commercial. The result of the sanitary sewer model indicated that the developer will be required to construct half of the improvements to the existing

sanitary sewer system located between the project and the northwest interceptor to make it an acceptable levels of service.

Item E is the community goal that must be met. This project, staff believes, complies with Policy MG7, Goal H, and Policy CF1, because annexation will provide additional land for housing development has been in the City Sphere of Influence since the year 2002, promotes Sparks' housing market, and a provision of the development agreement that the applicant is petitioning to be included in our IFSA Number 1, that impact service area, which with this development and will contribute to the construction of the fire station, storm drain, sewer, and parks improvements.

F is the efficient and cost-effective provision of services. The property served by the sanitary sewer, which would be extended from the east side of Pyramid Highway. And these capacity improvements will need to be added to these facilities.

The fire service would be from the Fire Station Number 4 or through the automatic aid agreement with the Truckee Meadows Fire District.

G, which is the fiscal impact analysis. The fiscal impact analysis provided estimated that this annexation and the single-family development of 1,223

single-family home units and 13 acres of commercial will generate $47.3 million in revenue to the General Fund and $33 million in General Fund expenditures, resulting in an anticipated cumulative positive impact of $14.3 million over a 20-year analysis period.

As for the Road Fund, the fiscal impact analysis estimates for a 20-year revenue of $3.3 million for the Road Fund and $14.9 million in expenditures. This estimate results in anticipated deficiency of $11.5 million over 20 years due to the disconnect between the limited sources of revenue available for the Road Fund and the high cost of street maintenance and repair. This is not a unique situation throughout the City and especially for this development.

Combining the net positive for the General Fund of $14.3 million and the net of the Road Fund at $11.5, this produces a project positive fiscal impact of approximately $2.8 million over the 20-year analysis period.

H, which is the Washoe County, the City did email or did send a packet to Washoe County. And we have not received any comments from Washoe County.

I is does it create any islands. This annexation will not create any islands and is continuous to City limits.

J, other factors. Before any tentative maps could be reviewed by the City, the applicant must prepare and submit a slope analysis per the Sparks Municipal Code 20.04.11, which is governs slopes, hilltops and ridges, delineating the developable portion of this property.

Addressing Finding A3, which is the conformance to the Comp Plan, as within the Sphere of Influence and the seven-year annexation program. The City of Sparks initially exerted planning jurisdiction by including this area in our Sphere of Influence in the year 2002. The City's annexation program did expire in 2015. However, NRS 268.670 allows for the City Council to consider annexing properties without an annexation program if it is contiguous to the City limits and the annexation is requested a hundred percent by the property owners. Both of these requirements are satisfied with this request for annexation.

The last finding is public notice. Again, this notice was published in the Reno Gazette-Journal on March 22nd, 2018. We noticed property owners within 750, for a total of 50 property owners.

Now I'd like to address the Comprehensive Plan use amendment. They're requesting this map. The existing is on the top, and the proposed is on the

bottom. So they're requesting to amend 4.3 acres of a Commercial, which is the little half moon there of Commercial, 85 acres of Employment Center, and approximately 298 acres of Open Space. Two, as shown in the lower graphic, two hundred and -- they are requesting to add 13.4 acres of Commercial. And then the balance of the property, which is 373 and a half acres, for Intermediate Density Residential. The DA, though, in the development agreement does limit the total area to be graded clear or disturbed to 225 acres or is longest at 58 percent of the property.

There are four findings for the Comprehensive Plan. The first one is the compliance with the regional plan. Staff feels that it complies with goals 1.1, 2.3, 3.5, because it is within our TMSA, the Sparks Municipal Code, and also the development agreement restricts the area that could be disturbed with the slope analysis as previously discussed. It also will be included in the IFSA Number 1, which will contribute to the construction of the fire station, storm drain, sewer, and park improvements, and along with the construction of capacity improvements to the interception of Highland Ranch Parkway and then also improvements from off Highland Ranch Parkway from Pyramid Highway to the entrance of the project.

This project does not -- let's see. The project does trigger, I guess, would be the word, three of the criteria for regional significance. The first one is that the project is proposed to be more than 625 units at the range of 1,200 to 1,800 units.

The traffic in the trigger for regional plan, or regional project is 6,250, and they're projecting 11,000, approximately 11,000 average daily trips.

The sewer generation standard is 17,500 gallons per day, and it's estimated that this project would generate 378,000 gallons per day.

Therefore, they have triggered three of the regional projects of significance, so that when this project is forwarded to regional planning, they will have to also look at a project of regional significance and compliance with this plan.

The next finding, which is CP2, CPA2, which is implementation of goals in the Comprehensive Plan, staff feels that this complies with Goal MG2, Policy MG5, Policy C1, Goal H2, and policies RC22 and RC23.

Because this will add lands of a mix of residential and commercial uses, and as discussed previously, the fiscal impact analysis projects a net positive fiscal impact. They will be included in the ISFA Number 1 development, will contribute contributions

to the improvements in the Spanish Springs area. It has a provision of additional lands for housing. And a slope analysis will be required per Sparks Municipal Code housing and the hillside section of the zoning code.

Finding C3, which is compatibility with surrounding land uses. The subject property is located on the west side of Pyramid Highway north of Highland Ranch Parkway. The Kiley Ranch North Planned Development is on the east side of Pyramid Highway. It has 157 acres designated as Commercial, including the site of a proposed hospital. None of the commercial uses planned for the Kiley Ranch North Planned Development have been developed to date.

The areas to the north are large single-family properties. To the west are vacant lands with steep slopes. The subject property was finally lined for aggregate. The single-family homes and commercial, as proposed in this project, will be more compatible with the surrounding land uses than the previously mining operation.

The last Comprehensive Plan finding is public notice. This was published in the Reno Gazette-Journal on March 22nd. And the applicant had a neighborhood meeting on February 20, 2018. There were 13 people that

attended that meeting with comments and lots of questions.

The next item is the rezoning request. When this property would be annexed into the City, it'll come in as A40, or Agricultural. That would be the entire 373.48 acres. The applicant is requesting to rezone the property to single-family 6,000, or SF6, and also commercial. The commercial would be right along the Highland Ranch Parkway.

The staff report has included a table which summarizes the permitted zoning uses by zoning district. I will not go into that tonight.

CHAIRMAN VANDERWELL: Thank you.

MS. MELBY: If the Comprehensive Plan amendment is not approved by the Planning Commission tonight, then rezoning cannot be approved.

There are three findings for zoning. The first one is the consistency with the Comprehensive Plan. As I previously discussed under Finding CP2, the staff believes that this finding can be made, but only if the Comprehensive Plan amendment is approved.

Zoning C2, which is consistent with the surrounding existing land uses. Again, as discussed on the Comprehensive Plan Finding 3, the rezoning is consistent with the commercial and residential

development designations in the Kiley Ranch North Planned Development and also Washoe County to the north, the large lots, residential lots to the north.

Finding Z3, which is public notice, the notice was published in the Reno Gazette-Journal on March 22nd, and we sent out 50 notices to property owners within 750 feet of the property.

Staff is recommending approval based on the findings as discussed under each of these requests.

I would like to make a reminder that you will have to make separate motions for each one of the four requests before you tonight.

That concludes our presentation. Armando, Chief Maples and myself are available to answer questions.

CHAIRMAN VANDERWELL: Thank you.

Yes, Chief Maples.

CHIEF MAPLES: I just want to clarify one thing before you guys move on. Karen referenced an automatic aid agreement that I have with Truckee Meadows. That agreement was negotiated prior to the time that this development was contemplated. I've had no discussions with Chief Miller whether or not that automatic aid agreement would apply to this property.

CHAIRMAN VANDERWELL: Thank you for the

clarification. Appreciate that.

Okay. Thank you.

Would the applicant like to speak?

MR. MIKE RAILEY: Good evening. For the record, Mike Railey with Rubicon Design Group representing the project applicant. Scott Christy and Blake Smith, the applicants, are with me tonight, along with Paul Solaegui, the project traffic engineer.

I think, staff did a very thorough job and a great job on the staff report, analyzing findings and explaining the project. We're here to answer any questions you might have tonight.

But before we get to that, I would like to touch on Chief Maples' comments in regards to fire. We are currently considering and analyzing alternatives to address the Chief's concerns, and we'll continue to work with him to make sure that we can come to a common ground on resolving the secondary access issue.

CHAIRMAN VANDERWELL: Terrific. Thank you.

Okay. So, I'm going to open each one of these up for discussion. So I'm going to open for public hearing DA18-0001.

And, so, call for anybody that wants to speak?

MS. MCCORMICK: Yes.

CHAIRMAN VANDERWELL: Okay. So, do we have any

requests to speak on DA -- okay. So. All right.

Mr. Cole, which part -- okay. Before I have you come up here, which part of the application would you like to talk about? Or just go ahead and come up, and let's have you discuss the whole.

MR. ROC COLE: All over.

CHAIRMAN VANDERWELL: Yep, there you go. Why don't you address the whole thing.

MR. ROC COLE: All of it pertains.

CHAIRMAN VANDERWELL: There you go. Go right ahead.

MR. ROC COLE: My name is Roc Cole. I'm a property owner adjacent to the north. And, you know, when we bought our properties, we were told this is Washoe County rural and would remain that. And now, all of a sudden, it's becoming, I guess, to be houses.

Just 18 years ago, or whatever, when the quarry applied for a permit there, we were told that this was a protected ridgeline above our homes and that nothing could, a road, a fence, a home, nothing could be built on that ridgeline. And, and when I look at the map, Village 5 and 6 is infringing on that ridgeline.

And if you look in that, in this right here at page 21, Policy RC23 is required for new development to preserve and protect amenities with many features. And

the problem is the quarry is unique because it can provide for an enclaved-type development pattern that preserves the ridgelines and focuses development in areas that were previously part of the aggregate quarry or well-suited for development.

I didn't, I couldn't make the previous community meeting, but I called Mike Railey, is it?

CHAIRMAN VANDERWELL: Uh-huh (affirmative).

MR. ROC COLE: And he assured me that all the building was down in flat, that nothing was going, it was too steep and nothing was going up on the hills. But now that you look at their map, there is substantial development on that ridgeline.

And I would think, with 390 acres to build on, they could remove that ridgeline building and keep it down in what they propose.

And I know I'm nobody, but I'm speaking for a lot of the residents there. And, by the way, that 750 feet barely covers two properties. You know, it doesn't reach out to everybody. I've made calls to people, and nobody was aware of this. And, like I said, we were promised in previous Commission meetings that that was a protected ridgeline.

That would be my first. The other one is traffic on Pyramid is already atrocious. I don't know

if any of you guys live out there, but it's ridiculous. And this little improvement to Highland Ranch Parkway does nothing for Pyramid. And this is a lot of housing, a lot going in. And that concerns me.

And, I guess, that's pretty much it. I would just appreciate if you could just make it, keep it off the ridgeline and give us a little buffer zone between what was supposed to be rural, and now it's becoming high-density. And it's on the property line.

Thank you so much for your consideration.

CHAIRMAN VANDERWELL: Thank you.

COMMISSIONER CAREY: Thanks for sticking around.

CHAIRMAN VANDERWELL: Yes. Do we have any other requests to speak?

Yes, sir.

MR. BRADLEY PAUL ELLEY: Thank you.

CHAIRMAN VANDERWELL: And then if you'll just fill out a request to speak when you're done. We can get it with the secretary when you're done.

MR. BRADLEY PAUL ELLEY: Okay. My name's Bradley Paul Elley, and my house is also (indistinct) on this project. And the problem is, I have the 20.5-acre lot that's directly north, right next to the one that's on the corner, the northeast corner. That's zoned

one-third acre residential. And the Lancing Group has over 200 acres that they're going to develop. They have a nice development out there. It's close to the high school. You can look down and see the high school from there. You can walk to the high school if you want to, ride a bike maybe. It is steep.

But if you ever go out there, and you walk it, where you think -- if you could put the map up of their parcel. I can see it in front here. But the topography, I share, I think, Mr. Cole's concerns. My property goes to the ridgetop. And what they want to do, they want to put in a congested area right below my property, 6,000-square-foot lot properties. That's really dense.

And what will happen in the winter, if there's any kind of inversion going on, and they allow any kind of burning to go on, all of these 6,000-acre lot residences, all that foul odor is going to go up onto my property. So I get to smell all this by-product of progress on my rural lot.

So I'm not real happy about that. I don't object to them building something. I'm not trying to say don't let them annex. But I'm trying to say, be reasonable. When you go up there and you look at the lot, you'll notice on a good day you don't hear much

road noise. On a bad day, when the wind's blowing up that, that -- if you look at the -- you can't see it from there. But the lay of the land there is it's an echo chamber for the freeway, which I call it the freeway, or the death trap for all the people who get killed by the drunks coming back from Pyramid Lake.

So that's going to be more congested. You're going to hear more traffic. They're going to put in, they're going to have to put in some sort of stoplight system or something there. So you're going to have that freeway come to a stop right there, and I'll hear even more motorcycles than I do now there.

But you also get, besides the noise that flows up there in that echo chamber, you also get a very windy area most days. Come up in a month when the wind's blowing, you'll be up there, and when I originally got this, I thought this would be a great place for a wind turbine, because the wind blows a lot up there. It blows everything --

(The three-minute warning sounded.)

MR. BRADLEY PAUL ELLEY: Oh, is that my three-minute? No.

CHAIRMAN VANDERWELL: That's your time.

MR. BRADLEY PAUL ELLEY: Oh, well, sorry.

CHAIRMAN VANDERWELL: Wrap it up.

MR. BRADLEY PAUL ELLEY: Well, I'll just say thank you for your time. But, please, this congestion right below my lot, it's not compatible with the area. Thank you.

CHAIRMAN VANDERWELL: Thank you. And if you'll see the -- if you'll fill out a form for us, we'd greatly appreciate it.

Are there any other comments?

Yes, sir.

MR. GREG ELLEY: Yeah, I didn't fill out a form.

CHAIRMAN VANDERWELL: That's quite all right. You can go ahead and speak, and if you'll say your name and your address.

MR. GREG ELLEY: Sure.

CHAIRMAN VANDERWELL: And then, yes, if you'll please fill out one when you're done.

MR. GREG ELLEY: Yeah, my name is Greg Elley, and I'm managing partner of Pyramid West Vistas, which is 20 acres adjoined to the north here. And my concern is I'm, basically, echoing what you just heard. The density, 6,000 square feet a lot is, I just think that's too small. And it's going to lead to too much traffic. The traffic's bad already, the noise.

People have the right to build on their land.

Let's try and do it going from half, I think. And that's, basically, it. I just think it's just too dense, and it's just overwhelming.

So those are my concerns. Thank you.

CHAIRMAN VANDERWELL: Thank you.

Anyone else?

Yes, sir. And also, we'll ask that you fill one out, too. Thank you.

MR. REIF MCELROY: My name's Reif McElroy. I live at 7895 Patrina Way to the north of the property. We have multiple residents over there that are on 11- and 12-acre parcels. And I'm just echoing what everybody else is saying there. This is a high-density project adjacent to what we all thought was, at one time, and is still, rural areas, small ranchettes, whatever you want to call them. This is going to impact all those areas to the north and to the west. And it's going to affect Highland as well.

The road improvement in Highland Ranch Parkway to the entrance, as it was shown earlier, I feel, is very inadequate. They should be improving Highland Ranch Road all along that property line. Because there's quite a bit of traffic on Highland Ranch Road now coming down to Pyramid. That little bit of improvement isn't going to do anything for all the other

traffic that's coming into this high-density density point.

I also have an issue -- being an ex-fireman, sir -- with the fire danger. You can always see where the fire impacted that area 15 years ago. You got to have adequate services for that many houses. You should be building a fire station in that location as one of your commercial things. So that would be something I would think you'd be looking at.

I don't begrudge development. I am a builder. So I want them to do what they need to do. I am also concerned about the ridgeline and how it impacts our properties to the north and wanting to keep the houses down. The quarry pit isn't -- I've been up there on my horseback and quad. It's already re-cut right now at a very steep slope, but I'm sure they're going to redevelop it to fit all those houses a little differently. But I would like to see the houses stay off the ridgeline completely. And that way, you're keeping that density more intact to itself.

I'm, basically, just voicing what everybody else is saying. And you do need to give notice not 700 feet from the property. This is a huge development. You need to go much further out. You need to hit the Desert Springs area that's impacting us to the north.

You need to hit the Highland area up to the west. You need to get better clarification. I found out about this yesterday, and I'm here now. So I think that needs to be improved.

Thank you.

CHAIRMAN VANDERWELL: Thank you. Appreciate you being here.

Anyone else?

Yes, sir.

MR. MIKE EASTMAN: Madam Chair, thank you for your time. We have their objection to this. It's close to my property, also.

CHAIRMAN VANDERWELL: Can you state your name and your address, please.

MR. MIKE EASTMAN: Mike Eastman, 10 Mac Road.

CHAIRMAN VANDERWELL: Thank you.

MR. MIKE EASTMAN: I think, in a shortcut, you've been had. I think, you have not been well-explained what kind of property this, this quarry is. If you look to the top of it, you'd probably first say, yeah, the top is here. But, of course, they can cut whatever they want to cut. It is a beautiful piece of property. It overlooks all of Sparks and all of Reno. Fantastic views up there. And, of course, people are going to want to build up there.

But what it does is impact our city in a way that we don't, don't really like. I don't think, I don't think any of you, if you lived where we live, would like that. You're going to have an entire beautiful ridge completely covered with houses in a way that is going to require them to do a lot of chopping and cutting up the hillside. it's going to have to come down a little bit. It's going to have to be flattened and leveled and all those kinds of things.

And I would encourage all of you to go out there and take a look at the site, both as a -- I know we're dealing with a dutiful hard decision, that you really don't -- and it's very tall. I mean it's a very, very good size ridge.

So I don't want to repeat everything everybody else has said. But I don't think they did good, good thoughts on anybody to the north, only, again, sending notification out to 750 people. Everybody out there has 10-acre lots. So 10-acre lots, you don't get in past the real first row of people. You don't get all the rest of the people out there with 10-acre lots if they don't even know this is happening.

So I would encourage that to be done. First, tell everybody else out there. And all those people are, I believe, under the same assumptions that Roc

mentioned earlier, that we are all under the assumption that this was a protected ridge. And all of them believe it's a protected ridge. And they're going to be shocked when they have to come out their front door and see this giant row of houses. Maybe each individual house is pretty. But a giant row of houses sitting on the top of a ridge in the middle of Sparks is not attractive, where you intentionally bought in this rural area for that protected area. And we would certainly like to see it stay that way.

I think, all of us understand development has to go. I don't know that all of this Kiley Ranch and all this valley area that is being built, it looks like there are thousands of room, thousands of lots left for houses. It appears on any map. You just look at it. There's so much plans for that whole area out there, I can't imagine that they have to have this quarry and chop down one of the most beautiful areas in the city for views and for appreciation. We could do better with things like parks, trails, those kind of things, for public use lands.

I would like to re-hit on that one big area, is the traffic. I don't think -- again, I don't know where you all live. But if you live on North Pyramid, north of this Highland Park Ranch, that traffic is,

particularly in the mornings -- obviously, mornings and evenings are worst -- it is just horrible. And it'll take forever to get down there. If you add 1,800 more homes and families that are trying to commute, sometimes two people each, all about the same time of day, it's just going to be bogged down and no one's going to be able to get anywhere.

So I'd appreciate it if you would really, really reconsider this and take a good look at where this property is, take a look at the elevations, the terrain out there, take a look at how --

(The three-minute warning sounded.)

MR. MIKE EASTMAN: -- wonderful it can actually be, and for some other purpose than up and by me with a bunches of houses on top of it.

Thank you.

CHAIRMAN VANDERWELL: Thank you.

Are there any other requests?

Yes, ma'am.

MS. PATRICIA METZ: I didn't (indistinct.)

CHAIRMAN VANDERWELL: That's fine. If you'll just state your name and your address. And then, when you're done, if you'll fill out the form, that would be wonderful.

MS. PATRICIA METZ: My name is Patricia Metz.

And I'm at seven 7335 Star Hill, which is the south part of this area where we all have these, the 10 acres at least, ranches. And mine is right up there against this proposed property, the top of my property. And I bought it in 2001. And I was under the impression that nobody would be ever building out there.

What I'm also concerned about this time, at this time is that so-called berm between -- if there is one, between my place and others that are up this mountain that we have there. It looks like we're going to be touching right where the proposed building will be.

Also, at one time, with the pit, I'll call it, they were also in agreement to never even have any dust coming up. You know, that was their agreement with people on the north side of where the pit is, which would be where I live.

I'm also concerned about fire situations, that they would have to have very good coverage. That is very dense, what they're proposing. And lots of people would be up there over, over our mountain.

No, we did not plan to have houses right up on that ridge. If it goes through, I would really hope that they would handle it better to be in concern of the people that live to the north. There's all this acreage

of ranches. And most of the people that live in the whole area don't even know they're there.

So I am concerned about this whole proposal and, also, the traffic on Highland Parkway. I go up that highway many times to go over to -- on the other side of 395 even. And people drive pretty crazy on it. And with more people going into that proposed construction, I think it would be pretty dangerous.

But, anyway, I think there's a lot of things to look at. And it's not a simple matter.

So thank you for your time.

CHAIRMAN VANDERWELL: Thank you, and we appreciate you staying.

Okay. With that, is there anyone else that requests to speak?

Okay. All right. Then, we're going to take each one of these separately. So I'm going to close the public hearing, and I'm going bring back to discuss DA18-001.

So do any of the Commissioners have questions, comments regarding the development agreement?

Commissioner Carey.

COMMISSIONER CAREY: Thank you, Madam Chair. Question for staff regarding the development agreement. Looking through Section 6.1, that requires the

maintenance of the open space on this property.

I think, one of the concerns that I have, and I appreciate Chief Maples being here, is wildfire. I think, we had some public comment expressed that, too. Given the topography of the site, I could see that wildfire being a serious issue.

My question about Section 6.1 requiring maintenance, does this section of the agreement require, you know, the HOA, or whoever is created for that, to maintain defensible space for the homes that are built?

MR. ORNELAS: The development agreement does not specifically address the issue of defensible space, Commissioner Carey. I mean I would refer the question, of course, to Chief Maples. But, typically, once the developable areas are truly defined, as you know, this is an exceptional land use plan -- scroll down.

This is a preliminary slope analysis. The section of the agreement that addresses slope analysis and development constraints, basically, requires an acknowledgment on the part of the developer that there are slope constraints. Ultimately, this slope analysis will have to be refined and the land plan updated to reflect the slope analysis.

That's a step towards, ultimately, the process of tentative and final maps where the areas that are --

expect to be designated open space and dedicated to the HOA or whatever the entity is responsible for maintaining, for the development agreement. We can start to look at the issue of that through that tentative map process.

There, it's my understanding, Chief Maples, that the International Fire Code has defensible space provisions.

CHIEF MAPLE: So, currently, in the City, we don't have any type of ordinance that regulates the wildland urban interface. And the reason for that is, historically, we haven't been developing out in these areas. It's been more of an urban area.

I believe, with the Andrea, that was the first one where we required the homeowners to, the homeowners association to maintain a defensible space on their property.

So, like Armando said, this is all very preliminary now. But I would assume that it incorporates something like that into this.

COMMISSIONER CAREY: Thank you, Chief, appreciate that, that answer.

My other question I had is concerning the development agreement. One of the key provisions of this development agreement is that it allows for the

property owner to petition to be included within IFSA Number 1. And my question is, about that is, with the proposed land, land uses on this site where it takes up the entire site where we have -- you know, it's all single-family, it's all commercial, how do those, those proposed acreages affect the calculations for our next IFSA update? Would we just take the two, one, and five acres that are developable, or would we take the entire acreages and calculate that?

MR. ORNELAS: We will be looking at development units for that purpose. So, as Mr. Martini explained to you in some detail in his presentation, and he did go into some detail, the -- you know, we'll be looking at the number of residential units, and commercial space will be taken into account as well.

And so it's not the acreage per se. It's the development units that will be taken into account with IFSA, IFSA Number 1.

The other point I would make, just as some clarification, is that by virtue of this agreement, they are petitioning. So this agreement, if approved by both parties, by the City Council, is the petition.

COMMISSIONER CAREY: Appreciate the clarifications. Thank you.

Thank you, Madam Chair.

CHAIRMAN VANDERWELL: Any other questions?

Commissioner Fewins.

COMMISSIONER FEWINS: Commissioner Fewins. And so under the development agreement, you talk about widening to four travel lanes from Pyramid Highway to -- on Highland Ranch to the -- on the map it was called the unknown road, as they name that. Are there any kind of -- with that development agreement, when you have -- say that this does go through, you have 1,800 homes coming down, there's no kind of traffic facility there at that unknown road and Highland Ranch Parkway intersection. Would there, could there be anything in that development agreement that will trigger something for some kind of traffic control at that intersection?

And then, further, those people are probably going to be taking a left through that, coming down Highland Ranch. Is that a --

MR. ORNELAS: I'm going to ask Amber Sosa to address that question, if she would.

COMMISSIONER FEWINS: Okay. Thank you.

MS. SOSA: For the record, Amber Sosa, Transportation Manager for the City of Sparks.

The traffic study provided for this for the Highland Ranch Parkway, and the project access intersection does provide for a three-lane traffic

signal control intersection.

MR. ORNELAS: Okay. Thank you.

COMMISSIONER FEWINS: And we had some discussion about Highland Ranch. And maybe this is for -- we were talking about Highland Ranch being done all the way. I think, there was public comment about improving that all the way. Can you explain possibly where that may not be able to do the development agreement with improving the whole road on that, please?

MR. MARTINI: Good evening, Madam Chair, members of the Commission. John Martini, Community Services Director.

So, as we -- we've talked many times as we look at development-related issues. When we look to a development to make a substantial public improvement, we are bound by, basically, two factors. One is a nexus, meaning do you have a reason to require an approval, or an exact what it is -- it could be improvement of a road, addition of a signal, building a flood control channel, whatever the project we're looking at seems to require.

The second one is called proportionality. So we have a duty to, if we decide we have a nexus to require the developer to do something that's typically an off-site improvement, what is the proportional effect

of that development on the object we're looking at? So in this case, Highland Ranch Parkway.

Certainly, as the project's proposed today, and we've heard discussion about two forms of access -- and the Chief and I will be working with the developer to figure that out. As of right now, you're looking at a project that has one way in and one way out. So it will certainly be utilizing, as we sit tonight, all of the traffic in this project will utilize Highland Ranch Parkway to either come in or out of the project.

So you have a nexus, we do. As we looked at this project over the last 18 months working with the developer, that was clear. Amber Sosa and your City Engineer, Jon Erickson, in conjunction with Mr. Solaegui's work, looked at what the impacts are. You've got the numbers in your report. The development agreement requires a certain amount of upgrading of Highland Ranch.

That is the proportional share. That's where we went. It is all, from the project entrance to Pyramid Highway, the effects on the roadway going forward are completely attributable to this project.

Now, certainly there's going to be some growth to the west in Sun Valley that likely will be coming over. But it is probably de minimis in comparison to an

1,800-unit subdivision utilizing this road.

So, to answer your question, yes, we can. But it has to be proportional.

So to the question asked tonight, why not just pave the road all the way to Sun Valley, I guess, would be the case? We could. However, their proportional share -- let's say it cost $100 to do that improvement. It's probably more like a couple of million bucks. Their share would be, say, $400,000 of that $2 million. The public has to come up with the rest.

As we sit here today, Highland Ranch Parkway is, you view that annexation, a portion of it will be owned now by the City of Sparks. The rest remains in Washoe County. The two entities would have to come together in conjunction with RTC to fund the project. So that can hang a developer up while public funding is being found. The easiest way to do this is to have them, conditioned through this development agreement, to make their proportional share of that upgrade to four lanes on Highland Ranch Parkway, subject to the conditions in the development agreement.

That's a very long-winded way to say, no, we can't just pay for the whole thing, or require them to pay for the whole thing.

COMMISSIONER FEWINS: Thank you.

CHAIRMAN VANDERWELL: Anybody else have any questions?

Commissioner Read.

COMMISSIONER READ: I have a question. I have a question for the applicant.

And, by the way, Commissioner Fewins and I did have the opportunity to take a field, a rather bumpy field trip around the project site. So thank you, Mr. Christy, for that opportunity and sharing your plans for the property.

I had a question regarding the quarry area and the fill. Can you describe the flood mitigation plans at that site?

MR. MIKE RAILEY: I'm going to let somebody that's much more intelligent than I am.

MR. SCOTT CHRISTY: Yeah, good evening. For the record, Scott Christy with QK.

So, currently, there are some, some drainage issues out there that exist today with this development. We're not changing the drainage pattern at all. We will be providing improvements that are going to improve the situation. We're working with staff to potentially improve the situation at the Highland Ranch/Pyramid intersection to improve the culverts that are there today, as well as drainage structures coming down

Highland Ranch parkway.

Did that answer your question?

COMMISSIONER READ: Vaguely.

MR. SCOTT CHRISTY: Well, what can I be more specific about?

COMMISSIONER READ: You had, when we were driving, you had mentioned some sediment basins and some extra hydraulic measures, and.

MR. SCOTT CHRISTY: Yeah, that's all included in what we would do on Highland Ranch Parkway. So there is a sediment, sedimentation issue that's been around a long time. We've actually been working in other areas in the city to help mitigate that. In part, what we would do is to add some sedimentation control. And that's part of the problem I referenced there at Highland Ranch/Pyramid intersection. With the improvements and infrastructure being put in, we could help mitigate that problem.

COMMISSIONER READ: Thank you.

CHAIRMAN VANDERWELL: Anybody else have any questions?

Okay. I just have one question, Mr. Ornelas. If you could address noticing before we move on with this.

MR. ORNELAS: So we notice per the requirements

of state law, which are likely in our municipal code as well. You know, we've often thought to ourselves, you know, sometimes it would, practically speaking, make sense to notice a larger area. We've had that conversation with our legal counsel. And, you know, it really raises the question of why did you do -- if you don't comply, if you don't do notice to be in compliance with state law and our municipal code, any time in the future when you deviate from that, you know, you're going to have to justify why, and why this time and why not some other time for some other project.

So on the advice of legal counsel, we complied with state law with regard to noticing.

CHAIRMAN VANDERWELL: Can you explain what state law says, so that -- because, I think, we have residents here that -- so that they understand how noticing happens.

MR. ORNELAS: Yeah. So, for example, where the Comprehensive Plant land use amendment, if you go to that finding, CP4, the noticing was done. There's a requirement for the immigrant meeting, which is the applicant's responsibility. And then --

MS. MELBY: Would you like me to address that?

MR. ORNELAS: Yes, if you would.

MS. MELBY: Karen Melby, Development Service

Manager. The noticing for the neighborhood meeting is 750 feet by state law. So the applicant did notice within 750 feet of the property. Annexations require 750 feet. And, also, the zone change, they're all 750 feet.

And the applicant received the notice for the neighborhood meeting from the City of Sparks. So it was the same notice list that was used for the neighborhood meeting was also used for the annexation request and also the rezoning.

MR. ORNELAS: And so there's a -- and there's a provision -- correct me if I'm wrong, Ms. Melby --

CHAIRMAN VANDERWELL: Thank you.

MR. ORNELAS: -- that, you know, you go out a certain distance for --

MS. MELBY: Yeah.

MR. ORNELAS: -- for the greater of a certain distance or a minimum number of property owners.

MS. MELBY: Which is 30.

MR. ORNELAS: It's 30. So.

CHAIRMAN VANDERWELL: Thank you.

MR. ORNELAS: In this case, for example, the 750 produced 50.

CHAIRMAN VANDERWELL: Okay. I appreciate that clarification. Thank you.

Mr. Railey, can I have a question of you, please? And I don't know if you can answer or not. Were you at the public meeting, the neighborhood meeting?

MR. MIKE RAILEY: Yes.

CHAIRMAN VANDERWELL: Okay. Can you synopsize what the people that attended, what their feedback was?

MR. MIKE RAILEY: I think, it kind of mimics what you heard here tonight in terms of density was a concern. Also, one issue that wasn't brought up tonight that was raised at the meeting was concern of a potentially access to the north through, up into that area. We addressed that and, you know, basically, this is like how the project will be laid out. And there was line issues and the density.

CHAIRMAN VANDERWELL: Okay. I appreciate that. Thank you.

With that, we'll go ahead, and I will --

COMMISSIONER FEWINS: Madam Chair.

CHAIRMAN VANDERWELL: Yes, Commissioner Fewins.

COMMISSIONER FEWINS: If I could have the Chief come back up.

CHAIRMAN VANDERWELL: Sure.

COMMISSIONER FEWINS: And we're still talking about the development?

CHAIRMAN VANDERWELL: Yes, we are.

COMMISSIONER FEWINS: Yeah. The second part, that access road that you're really talking about, you know, I was driving around the City of Sparks, and there's quite a few access roads currently in our city that are not -- can you just tell the differences between what those are per a public road and a fire access road, and why you think in this development, and I think you addressed it a little bit, but in your professional opinion, why that access road is not going to be good enough?

CHIEF MAPLES: So it's kind of what I talked about earlier.

COMMISSIONER FEWINS: Yes.

CHIEF MAPLES: Okay. It's not open all the time. Okay. So if there's an emergency, and there's only one way out, everybody funnels down the one road. If it's a public road, the secondary access that we're talking about, there's another, there's an alternative way out.

This is also a very large development with a large number of units. A lot of the access roads we have around here were for much smaller developments. Okay. My concern would be sometimes they are not built to accommodate two-way traffic. They're not plowable,

like I said. They're not regularly maintained. This area, you have some steep hillsides, that you're aware of. You could have rock slides, and people out there removing the rocks, and we have to access it, and then that hinders our ability to get in and out. It's the same thing.

COMMISSIONER FEWINS: Okay. Thank you.

CHAIRMAN VANDERWELL: Okay. Any other questions regarding the development agreement, comment?

Okay. I'm going to call on somebody if somebody doesn't step up. So let's go. Come on. Do you want to make a motion on the development agreement for me?

COMMISSIONER CAREY: Madam Chair, I'd be happy to --

CHAIRMAN VANDERWELL: Commissioner Carey.

COMMISSIONER CAREY: -- wager some comments. I'm not sure if I'm prepared to make a motion.

CHAIRMAN VANDERWELL: Okay. Go right ahead.

COMMISSIONER CAREY: Maybe my comments will spur some more --

CHAIRMAN VANDERWELL: There you go.

COMMISSIONER CAREY: -- discussion.

CHAIRMAN VANDERWELL: There you go.

COMMISSIONER CAREY: With respect to the

proposed development agreement, I certainly appreciate the work of staff. I think, there's a lot of good things in this development agreement. And it will provide some good, some good stuff to help out our infrastructure needs out there.

I do have a lot of concerns with the proposed land use changes. In my opinion -- I'm just one Commissioner up there. I don't believe that these proposed changes are consistent with the comprehensive -- or the proposed development agreement. Got ahead of myself.

CHAIRMAN VANDERWELL: Yeah.

COMMISSIONER CAREY: The proposed development agreement consistent with the Comprehensive Plan. This site has been designated as Business Park and Employment Center for many years now. I believe that that's an appropriate land use for this section. I think, from the land use point of view, I think there's more impacts from what the proposed land use is of this, in this development agreement are more impactful to the adjacent residences. I don't find that it's compatible.

So I won't be, I do not support this development agreement.

CHAIRMAN VANDERWELL: Thank you, Commissioner Carey.

COMMISSIONER FEWINS: Madam Chair.

CHAIRMAN VANDERWELL: Commissioner Fewins.

COMMISSIONER FEWINS: Commissioner Fewins. A little bit more discussion on that. I am actually in favor of the development agreement. I think, even though we do hear development is something that our city is growing and it's something that it's doing. And whether or not I -- I definitely hear concerns of citizens that own 10-acres to the north. But development is happening. Our city's growing. This is giving an ability for a housing shortage that we sound like we desperately -- well, it doesn't sound like -- we desperately are in need of. It's giving a vehicle for funding for some capital improvements that are definitely needed in this area.

And so, I think, you got to look at really we're going to want our city to grow. This is an ability to get an agreement with the developer to be able to fund items that are in desperate need in our city.

So I'm in support of this and the development agreement. I think, just the whole nexus of getting it, or concurrency with the agreement, I think, is a great plan. I think that staff's done a great job of doing that.

And, you know, we've had, we've definitely looked at annexing in the past and have not been favorable on it. Because, I think, developers did not meet with staff and get really the plan going. And I think that by them doing that and getting things going down the road in the right direction at the same time is a really good idea for our city.

CHAIRMAN VANDERWELL: Thank you.

Anyone else have any comment?

Okay. Is anybody prepared to make a motion?

COMMISSIONER FEWINS: Commissioner Fewins. I'm ready to make a motion. For the development agreement, I move to find the proposed development agreement associated with PCN16-0050 consistent with the Sparks Comprehensive Plan and to move forward with recommendation of approval to the City Council.

COMMISSIONER BROCK: Commissioner Brock. Second.

CHAIRMAN VANDERWELL: Okay. I have a first and a second. Is there any discussion?

Okay. I'm going to go ahead and make a comment. I am going to support the development agreement. I appreciate the time that staff has put into it. And I do understand, when you live in unincorporated Washoe County and then, all of a sudden,

we have land that then is concurrent to be annexed into the City, that there are different rules in the City, even though our unincorporated county. And, unfortunately, that is how growth is happening. And we're growing. And we need to make sure that we grow responsibly.

And I feel that with staff working with the developer, that they bring a plan in place. It is a 20-year build-out, so it's not something that when we start doing this, that we're going to start seeing sticks in the air tomorrow. So there are steps that have to happen in order for this to come to fruition.

So with that, I'll call, all in favor?

(Commission members said "aye.")

CHAIRMAN VANDERWELL: Any opposed?

COMMISSIONER CAREY: Nay.

CHAIRMAN VANDERWELL: Okay. Motion carries.

Okay. Next, we'll move along to AX16-003, the voluntary annexation. Commissioners, do we have any comments, anything else?

Commissioner Fewins.

COMMISSIONER FEWINS: Yeah, I do, one, on the annexation. So we're talking about services. And, mainly, and I think maybe Mr. Martinez best answered this. And I asked this in the Study Session. And, you

know, were talking about we had the sewer study done, and I think this was included in the sewer study posed. Correct? Or am I correct?

MR. MARTINI: Yes, so the property was initially included in the sewer study for its Comprehensive Plan, which, as Commissioner Carey pointed out earlier, was professional office. It has been remodeled, including the proposed development densities. Well, for, as requested, it is reflected in the development agreement we just we just voted on.

So, yeah, it's included. As Armando pointed out in his -- or Karen actually did. So the northwest interceptor, the big line that runs all the way out to, up past north of Long. So it has capacity to handle this proposed development. There are some improvements that the developer will be 100 percent responsible for to upgrade between this property and the interceptor, which lies on the kind of eastern boundary of the Kiley North development.

So that's a cost completely borne by the developer to upgrade those existing lines that don't have that capacity.

COMMISSIONER FEWINS: So the line, but, I guess, the line has capacity?

MR. MARTINI: The interceptor does.

COMMISSIONER FEWINS: The interceptor does.

MR. MARTINI: Which is included in Impact Fee Service Area 1.

COMMISSIONER FEWINS: Yeah. What about where it comes down to the river, the facility?

MR. MARTINI: We're getting all the way to the river, actually, all the way to TMWRF.

COMMISSIONER FEWINS: So the facility itself has capacity to --

MR. MARTINI: So when we speak to TMWRF --

COMMISSIONER FEWINS: Yes.

MR. MARTINI: -- TMWRF has a permitting capacity that is both, it has a hydraulic capacity rating of about 44 million gallons a year. As the Commission knows, we also have wasteload allocation requirements on the river. Which the big three are limited nitrogen, the phosphorus, and total dissolved solids.

As you all well know, our nitrogen discharged to the river has been creeping up. So your Sparks staff, in conjunction with the staff at Reno, since we've worked jointly when operating the plant, we're working on the next upgrade and some work right now.

COMMISSIONER FEWINS: Okay.

MR. MARTINI: So Sparks does have some remedial

capacity, as been showed in the build-out of the sewer. Because you remember the results of the mall. We do need additional capacity in the future at TMWRF. In the near term, we're going to need to make some improvements to cut down on the nitrogen and TDS that we're putting into the river to allow for additional development.

So the way that is play out is, when we have arrived at that next black box, if you will, where the plant is, that will be loaded into the capital improvements plan for TMWA. Once approved by our City Council, then those costs are loaded into our rate studies for connection fees. I suspect we'll see a connection fee study coming your way here shortly. Mr. Hummel's working on one right now.

To answer your question, Commissions Fewins, if you need to create some more capacity on a chemical basis, there is a plan moving forward and a (indistinct).

COMMISSIONER FEWINS: Okay. Can we talk about -- Commissioner Fewins again -- storm drain in this closed basin?

MR. MARTINI: And it's not a closed basin.

COMMISSIONER FEWINS: I guess, with one, one river out.

MR. MARTINI: That's right, one river out.

COMMISSIONER FEWINS: Well, there's been a lot of talk about in north Reno on certain areas of flood. What are some things that we will not have that problem, you think, in this area?

MR. MARTINI: So, as you well know, since I was just here meeting last, talking about an active service area, it includes some $18 million in flood control projects, most of which have already been completed within Impact Fee Service Area 1.

With their petition tonight, so to cut it short, all their stormwater that this generates will come down Highland Ranch Parkway in one form or another. They'll certainly have some retention basins on site to cut the flows down. It will then cross Pyramid Highway and get into, directly into the Sun Valley diversion channel, which is a capital improvement item inside Kiley Ranch, flow behind the Kiley Ranch dam, and then enter into the rest of our flood control structures that we built south of Kiley Ranch dam, all the way down to the river.

And as the Commission knows, we are just about a month and a half away from completing the north Truckee drain improvements through the industrial area. So all of the water from Highland Ranch Parkway will actually go out that brand-new twin 14-by-10 culvert

that we built, one way or another.

COMMISSIONER FEWINS: Okay. Thank you.

CHAIRMAN VANDERWELL: Thank you.

Anybody else have any questions, comments?

Okay. No. I'll entertain a motion on the annexation.

MS. MCCORMICK: Madam Chair?

CHAIRMAN VANDERWELL: Yes.

MS. MCCORMICK: Assistant City Attorney Alyson McCormick. If you could open the item for public hearing.

CHAIRMAN VANDERWELL: Yes. I apologize. Okay. This is a public hearing. And I will open this item. So if anybody would like to speak on it, you're welcome to come up and speak.

Okay. Seeing none, I'll close the public hearing and bring it back to the Commission. Questions, comments?

COMMISSIONER READ: Madam Chair, I'll move to --

CHAIRMAN VANDERWELL: Commissioner Read, thank you.

COMMISSIONER READ: Before I was called on. I move to forward a recommendation of approval to City Council for the annexation request AX16-003 associated

with PCN16-0050, based on findings A1 through A4 and the facts supporting these findings as set forth in the staff report.

CHAIRMAN VANDERWELL: We need a second.

COMMISSIONER FEWINS: Commissioner Fewins seconds.

CHAIRMAN VANDERWELL: Okay. I have a first and a second. Any discussion?

Commissioner Carey?

COMMISSIONER CAREY: Quick comment, if I may.

CHAIRMAN VANDERWELL: Yes.

COMMISSIONER CAREY: Although I don't agree with the proposed land uses, I do concur with staff's recommendation. I find that this is a logical extension of the City limits. I believe, it is also contiguous. I see no need to disagree with the recommendation of staff on this one. Thank you.

CHAIRMAN VANDERWELL: Appreciate that.

Okay. All in favor?

(Commission members said "aye.")

CHAIRMAN VANDERWELL: Any opposed?

Okay. The motion carries.

Next, we'll discuss the comprehensive land use amendment request, which is MK17-0005, public hearing item. And I will open it. Would anybody like to come

up and speak on that?

Okay. With that, I'll close the public hearing and bring it back to the Commission. Any Commissioners have any comments?

Commissioner Carey.

COMMISSIONER CAREY: Couple questions for staff, if I may. With the proposed Comprehensive Plan amendment, do we have any idea of what the fiscal impact to the City would be from changing the land use from Business Park, Employment Center, to single-family and Commercial?

MS. MELBY: The fiscal impact analysis that we discussed earlier had a net benefit, if I remember the numbers correctly --

CHAIRMAN VANDERWELL: It's 2.8.

MS. MELBY: -- of 2.8 acres.

CHAIRMAN VANDERWELL: $2.8 million.

MS. MELBY: $2.8 million.

CHAIRMAN VANDERWELL: Yes.

MS. MELBY: Yes.

CHAIRMAN VANDERWELL: Yeah, it was.

MR. ORNELAS: Arkansas Ornelas, Assistant Community Services Director. I think, to more directly address your question, Commissioner Carey, the fiscal impact analysis did not ask for repairs and, if you

will, of the instant uses to the proposed uses. The fiscal impact instances for the proposed use and zoning classification.

You know, I would say that with this, something along the lines of a planned development, where you add in particular specific uses that's been, you know, designated and contemplated, it would be, you know, it would have been probably something that we would have amended. In this case, we did not do that.

COMMISSIONER CAREY: Sometimes it's definitely the opinion of staff that this side is not suitable for business park, more suitable for --

MR. ORNELAS: Yeah, I mean I would have to agree with the applicant's contention that given the compatibility of the site, that the employment center types of uses at the designation that is on there contemplates aren't really viable.

You know, I would point to the much more developable and for purposes of employment center are on the east side of the Pyramid Highway in Kiley Ranch North and Stonebrook. I think, those are appropriate locations for that type of use. I think, the market hasn't been there to date. But I think that that's a more realistic expectation from that side of the highway.

You know, certainly it's nothing that we can, any of us can for certain. But I appreciate the question. But I would, I would agree with the applicant's contention, again, that this is not a particularly suitable site for (indistinct).

COMMISSIONER CAREY: Okay. I think, I know how this is going to go. All of it's just in there. Thank you.

CHAIRMAN VANDERWELL: Commissioners, any other Commissioners have any questions?

Okay. I'll entertain a motion.

COMMISSIONER PETERSEN: Madam Chairman, I can make a motion on this one.

CHAIRMAN VANDERWELL: Commissioner Petersen, thank you.

MS. MCCORMICK: Madam Chair, did you public hearing on this one?

CHAIRMAN VANDERWELL: I did.

MS. MCCORMICK: Thank you.

CHAIRMAN VANDERWELL: Thank you. You're training me good. So, thank you. That's okay. We all are.

COMMISSIONER PETERSEN: Commissioner Petersen. I move to approve the Comprehensive Plan land use amendment MPA17-0005 associated with PCN16-0050 based on

the findings CP1 through CP4 and the facts supporting these findings as set forth in the staff report.

CHAIRMAN VANDERWELL: Can I get a second?

COMMISSIONER READ: Commissioner Read. Second.

CHAIRMAN VANDERWELL: Thank you. I have a first and second. Any discussion?

Commissioner Carey.

COMMISSIONER CAREY: Thank you, Madam Chair. I'll try to keep this brief.

I will not be supporting the motion. I disagree with the proposed land use change. I think that this site has been designated as an employment center for a long time. I agree with that. Past, past master plan amendments, I would agree with that as well.

I believe that, if we're going to really get serious about meeting our employment goals of the Comprehensive Plan, we need to stick with our master plan. We need jobs in the Spanish Springs valley.

I think, if we're going to solve the traffic issues on Pyramid Highway, on Vista, on Sparks Boulevard, we really need to get serious about keeping with our master plan and having offices in Sparks.

I certainly appreciate staff's opinion of that this will help meet the housing goals. We have immediate need for housing. There's no doubt about

that. But in the opinion, humble opinion of this Commissioner, I believe that we need to advance our employment goals that have been on the books for 30 years.

And I will not be supporting the motion. Thank you very much.

CHAIRMAN VANDERWELL: Okay. With that, I'll call for the vote. All in favor?

(Commission members said "aye.")

CHAIRMAN VANDERWELL: Opposed?

COMMISSIONER CAREY: Nay.

CHAIRMAN VANDERWELL: Okay. Thank you. Motion carries.

Next, we'll move along to the rezoning request RZ17-0006. I will open the public hearing. Is there anybody that requests, requests to speak?

Yes. And if you'll please state your name and your address again, please. Thank you.

MR. BRADLEY PAUL ELLEY: Bradley Paul Elley again.

CHAIRMAN VANDERWELL: Thank you.

MR. BRADLEY PAUL ELLEY: I've been a property owner in Spanish Springs, and my family has, since 1974 when Mr. York sold us the lots that Mr. Harvey Whittemore had the City of Sparks, basically, put in an

enclave of his property. So we had to drive a quarter mile out to get to the new road.

So I say that because I don't know what is compatible with a development of 6,000-square-foot lots with adjoining one-third acre and 40-acre and 20-acre lots. Can anyone please explain that to me? Why is that compatible? Do you have any idea how small that is?

And modern zoning normally doesn't allow that, except for senior housing, okay, in my understanding. But you don't seem concerned about that at all.

So, again, my office is getting gored. Thank you.

CHAIRMAN VANDERWELL: Thank you.

Anybody else wish to speak?

With that, I'll close the public hearing and bring it back to the Commission. Any questions, comments?

COMMISSIONER FEWINS: Yeah, I have a question of Karen.

MS. MELBY: Yes.

COMMISSIONER FEWINS: Karen, I think, a couple years ago you did a very thorough study on the air, airplanes that tried to fly with this property. Did you find that it was loud out there on the approaches and

leaving of the airplanes?

MS. MELBY: No. The planes that flew over the site when I was doing the noise study, before they opened the Granite, that Granite opened their pit there, was very -- hardly picked up on the noise meter.

COMMISSIONER FEWINS: Thank you.

MS. MELBY: M-hm (affirmative).

CHAIRMAN VANDERWELL: Any other questions?

I have a question for clarification, please, for the gentleman that spoke before, to discuss as far as density. And then a follow-up with that is our code regarding ridgeline development and slope development.

MS. MELBY: Okay.

CHAIRMAN VANDERWELL: Thank you.

MS. MELBY: Your first question is in regard to the property?

CHAIRMAN VANDERWELL: The property, the proposed property density and why we're -- why we're proposing it, that it's allowed.

COMMISSIONER CAREY: I think, compatibility.

CHAIRMAN VANDERWELL: The compatibility, yes.

MS. MELBY: The compatibility.

CHAIRMAN VANDERWELL: Thank you.

MS. MELBY: Well, the Kiley Ranch project to the east of this will have actually even smaller than

6,000-square-foot lots. Some of the villages have like 4,500-square-foot lots. Typical, a 6,000-square-foot lot is our typical lot size for residential within the City of Sparks. So 6,000-square-foot lot is pretty typical, and that is our most common zoning district within the City of Sparks if you look at a zoning map. It is the most common. And, also, most common, I think, in most of our planned development handbooks, also.

So that's why we feel that it's -- it's the typical lot size within the City of Sparks.

CHAIRMAN VANDERWELL: Thank you. The next, ridgeline development?

MS. MELBY: When we do the slope analysis, we'll have to look at the steep slopes in that area. We had in the Sparks Municipal Code an identified ridgeline. And I did look at that map when I was preparing the staff report. And that is not an identified ridgeline in the code.

CHAIRMAN VANDERWELL: Okay. Thank you. Appreciate the clarification.

Anyone else, questions, comments?

Okay. We're going to draw straws here in a minute, you guys.

COMMISSIONER READ: Madam Chair, I'll make a motion.

CHAIRMAN VANDERWELL: Commissioner Read, thank you.

COMMISSIONER READ: I move to forward a recommendation of approval to City Council for the rezoning request RZ17-0006 associated with PCN16-0050 based on findings Z1 through Z3 and the facts supporting these findings as set forth in the staff report.

CHAIRMAN VANDERWELL: Can I get a second, please?

COMMISSIONER FEWINS: Yeah, Commissioner Fewins seconds.

CHAIRMAN VANDERWELL: Okay. I have a first and a second. Any discussion?

Commissioner Carey.

COMMISSIONER CAREY: Thank you, Madam Chair. I will be supporting the motion to approve. I know disagree with the land use change. However, now that our Comprehensive Plan has been changed, I find that this rezone is compatible with it. I can meet all the required findings.

CHAIRMAN VANDERWELL: Thank you.

With that, all in favor?

(Commission members said "aye.")

CHAIRMAN VANDERWELL: Any opposed?

Okay. Thank you. Motion carries.

Exhibit A

The Quarry: Legal Description

All that certain real property situate within a portion of Section 9, Township 20 North, Range 20 East, Mount Diablo Meridian, County of Washoe, State of Nevada, described as follows:

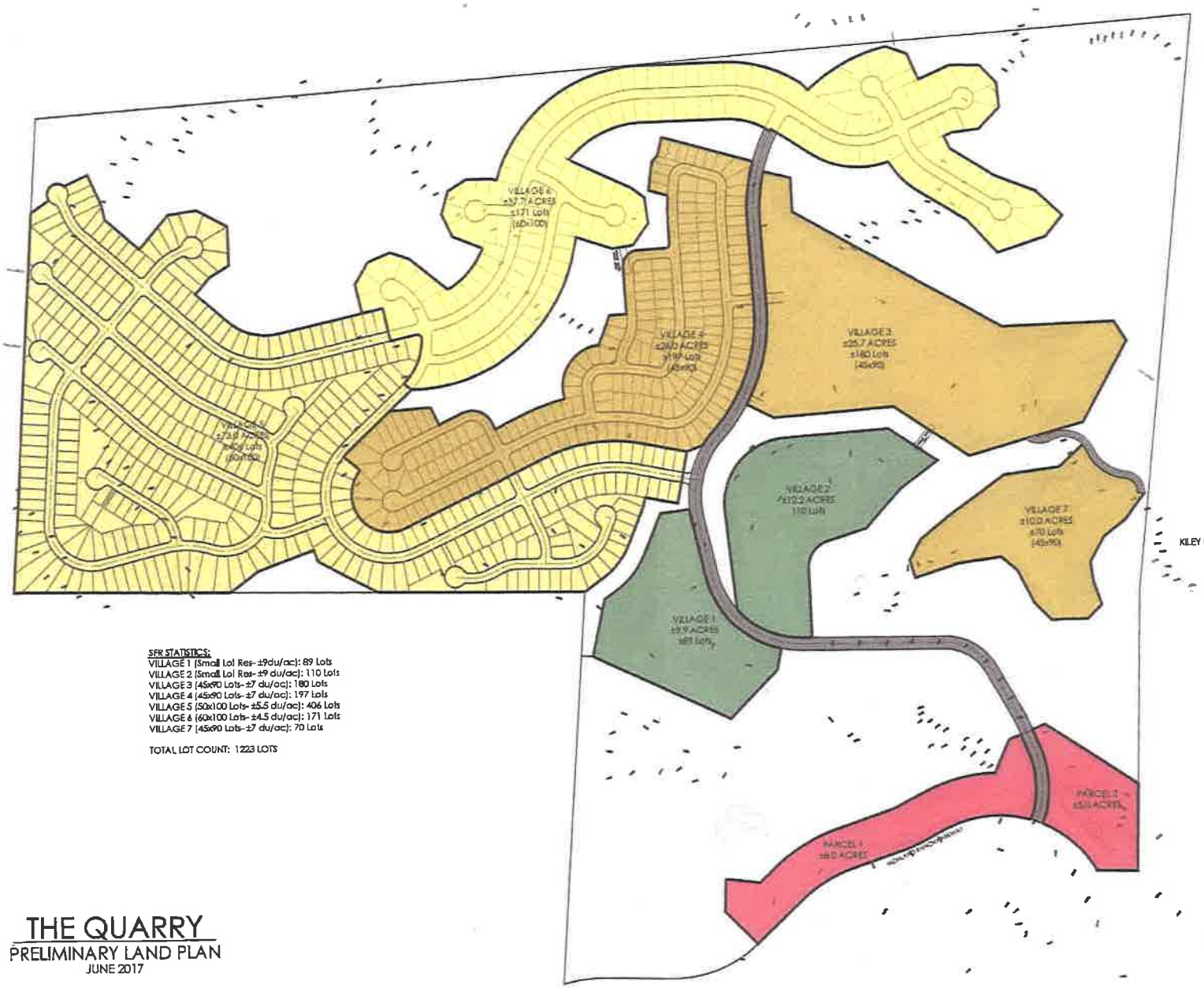
Parcel 2 as shown on the Record of Survey to support a Boundary Line Adjustment (RS3818) filed within the Official Records of Washoe County, Nevada on June 30, 2000 as File No. 2460839 and being more particularly described as follows:

Beginning at the Northeast corner of Section 9;
South 05°43'28" West, 2702.52 feet to the East one- quarter (E ¼) corner of Section 9; Continuing along the Easterly line of Section 9, South 00°57'17" West, 1318.51 feet to the Northerly line of the Southeast one-quarter (SE ¼) of Section 9; Thence along the Northerly line of the Southeast one-quarter (SE ¼) of Section 9, North 89°02'15" West, 189.31 feet to the Northerly right-of-way of Highland Ranch Parkway; Leaving the Northerly line of the Southeast one-quarter (SE ¼) of Section 9, along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a non-tangent curve to the left, from a tangent which bears North 29°56'39"West, having a length of 815.03 feet and a radius of 530.00 feet, through a central angle of 88°06'31"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, South 61°56'50" West, 126.45 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the right, having a length of 90.68 feet and a radius of 570.00 feet, through a central angle of 09°06'56"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, South 71°03'46" West, 254.89 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the left, having a length of 279.50 feet and a radius of 630.00 feet, through a central angle of 25°25'09"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, South 45°38'37" West, 300.00 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the right, having a length of 453.78 feet and a radius of 570.00 feet, through a central angle of 45°36'50"; Continuing along the Northerly right-of-way of Highland Ranch Parkway, North 88°44'33" West, 300.00 feet; Continuing along the Northerly right-of-way of Highland Ranch Parkway, along the arc of a curve to the left, having a length of 204.69 feet and a radius of 630.00 feet, through a central angle of 18°36'55", to the North-South centerline of Section 9; Leaving the Northerly right-of-way of Highland Ranch Parkway, along the North-South centerline of Section 9, North 03°39'56" East, 1859.59 feet to the center of Section 9; Thence along the East-West centerline of Section 9, North 89°25'32" West, 2683.82 feet to the West one-quarter (1/4) of Section 9; Thence along the West line of Section 9, North 03°18'58" East, 2211.00 feet to the Northwest corner of Section 9; Thence along the North line of Section 9, North 85°28'37" East, 2721.15 feet to the North one-quarter (N ¼) corner of Section 9; Continuing along the North line of Section 9, North 85°29'07" East, 2720.96 feet to the Northeast corner of Section 9 and the Point of Beginning.

Containing 386.87 acres, more or less.

APN: **083-011-15**

11/23/16



SFR STATISTICS:
VILLAGE 1 (Small Lot Res- ±9du/ac): 89 Lots
VILLAGE 2 (Small Lot Res- ±9 du/ac): 110 Lots
VILLAGE 3 (45x90 Lots- ±7 du/ac): 180 Lots
VILLAGE 4 (45x90 Lots- ±7 du/ac): 197 Lots
VILLAGE 5 (50x100 Lots- ±5.5 du/ac): 406 Lots
VILLAGE 6 (60x100 Lots- ±4.5 du/ac): 171 Lots
VILLAGE 7 (45x90 Lots- ±7 du/ac): 70 Lots

TOTAL LOT COUNT: 1223 LOTS

THE QUARRY
PRELIMINARY LAND PLAN
JUNE 2017

CHRISTY CORPORATION

EKAY | ECONOMIC CONSULTANTS

June 13, 2018

Mr. Blake Smith
S3 Development Company, LLC
1 East Liberty Street
Suite 444
Reno, NV 89501

Re: Update of Fiscal Impact Analysis of Proposed Quarry Development

Dear Mr. Smith:

Per your request, I updated the fiscal impact analysis of The Quarry project originally conducted in December 2017. It is my understanding the project is proposed to widen a portion of a street included in the December analysis as a 2-lane street, to a 4-lane street. This update includes the addition of 2-lanes to a 3,500 linear foot portion of the street, for a total of 84,000 square feet of additional streets constructed by the Developer and dedicated to the City of Sparks for maintenance.

This update impacts both the General and Road Funds. In the General Fund, road square feet are used to estimate costs associated with Community Services expenditures in the Public Safety and Public Works functions. The Road Fund provides road repair and maintenance services for all City of Sparks streets and will also be impacted by the increase in the size of project streets. Costs for both Funds will increase with the addition of 84,000 square feet of streets to the 1.01 million square feet already considered in the December 2017 report. No other changes to the December 2017 report are considered.

Table 1 below shows the estimated impacts of The Quarry project on the City of Sparks General Fund from the original December 2017 report and the June 2018 update. The table shows General Fund surplus, over the 20-year analysis period, is expected to decrease from $14.3 million in the original report to $14.1 million in the June 2018 given the additional 84,000 square feet of streets.

Table 1. Comparison of General Fund Impacts

December 2017 Report					June 2018 Update				
Year	Total Project Revenue	Total Project Costs	Annual Revenue Surplus	Cumulative Revenue Surplus	Year	Total Project Revenue	Total Project Costs	Annual Revenue Surplus	Cumulative Revenue Surplus
2018	$ 54,948	$ -	$ 54,948	$ 54,948	2018	$ 54,948	$ -	$ 54,948	$ 54,948
2019	214,704	127,082	87,622	142,570	2019	214,704	131,793	82,911	137,859
2020	657,964	471,101	186,863	329,433	2020	657,964	475,953	182,011	319,870
2021	1,116,366	770,640	345,726	675,159	2021	1,116,366	775,638	340,728	660,599
2022	1,599,636	1,080,582	519,054	1,194,213	2022	1,599,636	1,085,729	513,907	1,174,505
2023	2,069,269	1,428,133	641,136	1,835,349	2023	2,069,269	1,433,435	635,834	1,810,339
2024	2,432,609	1,714,223	718,386	2,553,735	2024	2,432,609	1,719,684	712,925	2,523,264
2025	2,505,588	1,764,183	741,404	3,295,139	2025	2,505,588	1,769,808	735,780	3,259,044
2026	2,580,755	1,815,642	765,114	4,060,253	2026	2,580,755	1,821,435	759,320	4,018,364
2027	2,658,178	1,868,644	789,534	4,849,787	2027	2,658,178	1,874,611	783,567	4,801,931
2028	2,737,923	1,923,236	814,687	5,664,474	2028	2,737,923	1,929,383	808,541	5,610,471
2029	2,820,061	1,979,466	840,595	6,505,069	2029	2,820,061	1,985,797	834,264	6,444,735
2030	2,904,663	2,037,383	867,279	7,372,348	2030	2,904,663	2,043,904	860,759	7,305,494
2031	2,991,803	2,097,038	894,765	8,267,113	2031	2,991,803	2,103,754	888,048	8,193,542
2032	3,081,557	2,158,482	923,075	9,190,188	2032	3,081,557	2,165,400	916,157	9,109,699
2033	3,174,003	2,221,770	952,234	10,142,422	2033	3,174,003	2,228,895	945,109	10,054,808
2034	3,269,224	2,286,956	982,268	11,124,690	2034	3,269,224	2,294,295	974,929	11,029,737
2035	3,367,300	2,354,097	1,013,203	12,137,893	2035	3,367,300	2,361,657	1,005,644	12,035,381
2036	3,468,319	2,423,253	1,045,066	13,182,959	2036	3,468,319	2,431,039	1,037,280	13,072,661
2037	3,572,369	2,494,484	1,077,885	14,260,844	2037	3,572,369	2,502,503	1,069,865	14,142,526
Total	**$ 47,277,239**	**$ 33,016,396**	**$ 14,260,844**		**Total**	**$ 47,277,239**	**$ 33,134,713**	**$ 14,142,526**	

Table 2. Comparison of Road Fund Impacts

December 2017 Report					June 2018 Update				
Year	Total Project Revenue	Total Project Costs	Annual Revenue Surplus	Cumulative Revenue Surplus	Year	Total Project Revenue	Total Project Costs	Annual Revenue Surplus	Cumulative Revenue Surplus
2018	$ -	$ -	$ -	$ -	2018	$ -	$ -	$ -	$ -
2019	-	522	(522)	(522)	2019	-	784	(784)	(784)
2020	31,718	819,813	(788,094)	(788,616)	2020	31,718	888,285	(856,567)	(857,351)
2021	65,076	820,247	(755,171)	(1,543,787)	2021	65,076	888,737	(823,661)	(1,681,012)
2022	98,507	821,873	(723,366)	(2,267,154)	2022	98,507	890,382	(791,875)	(2,472,887)
2023	137,239	824,087	(686,848)	(2,954,002)	2023	137,239	892,614	(755,375)	(3,228,261)
2024	176,048	825,709	(649,661)	(3,603,663)	2024	176,048	894,255	(718,207)	(3,946,468)
2025	181,329	825,862	(644,533)	(4,248,196)	2025	181,329	894,428	(713,098)	(4,659,567)
2026	186,769	826,019	(639,250)	(4,887,446)	2026	186,769	894,604	(707,834)	(5,367,401)
2027	192,372	826,179	(633,806)	(5,521,252)	2027	192,372	894,783	(702,411)	(6,069,812)
2028	198,143	826,341	(628,198)	(6,149,450)	2028	198,143	894,967	(696,823)	(6,766,635)
2029	204,088	826,507	(622,420)	(6,771,870)	2029	204,088	895,154	(691,066)	(7,457,701)
2030	210,210	826,677	(616,466)	(7,388,336)	2030	210,210	895,344	(685,134)	(8,142,835)
2031	216,517	826,850	(610,333)	(7,998,669)	2031	216,517	895,539	(679,022)	(8,821,857)
2032	223,012	827,026	(604,014)	(8,602,683)	2032	223,012	895,737	(672,725)	(9,494,582)
2033	229,703	827,206	(597,503)	(9,200,185)	2033	229,703	895,939	(666,237)	(10,160,819)
2034	236,594	827,389	(590,795)	(9,790,981)	2034	236,594	896,146	(659,552)	(10,820,371)
2035	243,691	827,576	(583,884)	(10,374,865)	2035	243,691	896,356	(652,665)	(11,473,036)
2036	251,002	827,767	(576,764)	(10,951,630)	2036	251,002	896,571	(645,569)	(12,118,605)
2037	258,532	827,961	(569,429)	(11,521,059)	2037	258,532	896,790	(638,258)	(12,756,862)
Total	**$ 3,340,551**	**$ 14,861,610**	**$ (11,521,059)**		**Total**	**$ 3,340,551**	**$ 16,097,414**	**$ (12,756,862)**	

Table 2 shows the comparison of the impacts of The Quarry on the City's Road Fund over the 20-year analysis period. The December 2017 report found a deficit for the Road Fund of $11.5 million over the 20-year analysis period. Adding the 84,000 square feet of streets (June 2018 update) increases the deficit for the Fund to $12.8 million.

This analysis shows that The Quarry project is still expected to have a **positive fiscal impact** on the City of Sparks, as the projected General Fund surplus is expected to exceed the estimated deficit in the Road Fund, even with the addition of 84,000 square feet of streets. This includes a $965,000 contingency amount for the City's General Fund, which is not an actual cost for the City.

Updated Appendices 1-9 of the fiscal impact analysis are attached. Of these only Appendix 6 and 9 were updated from the December 2017 report. No methodology or other inputs (other than increase in project streets) changes were made in the June 2018 update. Please see the December 2017 report for methodology, assumptions, and other information.

Please contact me with any questions or concerns.

Sincerely,

Eugenia Larmore

Eugenia Larmore, PhD, MBA, CMA, CVA, MAFF

APPENDIX 1
BUILDOUT ASSUMPTIONS

YEAR	USE TYPE	SQUARE FEET BUILT	# OF UNITS BUILT	ADDED LAND VALUE	ADDED IMPROVEMENTS VALUE	CONSTRUCTION MATERIALS COST
2018	Village 1	-	-	$ 2,018,250	$ -	$ -
	Village 2	-	-	2,466,750	-	-
	Village 3	-	-	-	-	-
	Village 4	-	-	3,950,100	-	-
	Village 5	-	-	5,535,000	-	-
	Village 6	-	-	-	-	-
	Village 7	-	-	-	-	-
	Gen. Commercial	-	-	1,271,044	-	-
	Open Space	-	-	1,081,066	-	-
Subtotal		**-**	**-**	**16,322,211**	**-**	**-**
2019	Village 1	85,500	45	1,973,400	9,418,500	4,709,250
	Village 2	110,000	55	2,466,750	11,511,500	5,755,750
	Village 3	-	-	-	-	-
	Village 4	151,800	66	3,950,100	18,433,800	9,216,900
	Village 5	205,000	82	5,467,500	25,830,000	12,915,000
	Village 6	-	-	-	-	-
	Village 7	-	-	-	-	-
	Gen. Commercial	87,120	-	794,403	10,756,687	5,378,344
	Open Space	-	-	-	-	-
Subtotal		**639,420**	**248**	**14,652,153**	**75,950,487**	**37,975,244**
2020	Village 1	83,600	44	-	9,209,200	4,604,600
	Village 2	110,000	55	-	11,511,500	5,755,750
	Village 3	-	-	-	-	-
	Village 4	151,800	66	3,890,250	18,433,800	9,216,900
	Village 5	202,500	81	5,467,500	25,515,000	12,757,500
	Village 6	-	-	6,437,100	-	-
	Village 7	-	-	-	-	-
	Gen. Commercial	54,450	-	-	6,722,930	3,361,465
	Open Space	-	-	-	-	-
Subtotal		**602,350**	**246**	**15,794,850**	**71,392,430**	**35,696,215**
2021	Village 1	-	-	-	-	-
	Village 2	-	-	-	-	-
	Village 3	-	-	5,386,500	-	-
	Village 4	149,500	65	-	18,154,500	9,077,250
	Village 5	202,500	81	5,467,500	25,515,000	12,757,500
	Village 6	232,200	86	6,362,250	30,039,800	15,019,900
	Village 7	-	-	-	-	-
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**584,200**	**232**	**17,216,250**	**73,709,300**	**36,854,650**
2022	Village 1	-	-	-	-	-
	Village 2	-	-	-	-	-
	Village 3	207,000	90	5,386,500	25,137,000	12,568,500
	Village 4	-	-	-	-	-
	Village 5	202,500	81	5,467,500	25,515,000	12,757,500
	Village 6	229,500	85	-	29,690,500	14,845,250
	Village 7	-	-	6,037,500	-	-
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**639,000**	**256**	**16,891,500**	**80,342,500**	**40,171,250**
2023	Village 1	-	-	-	-	-
	Village 2	-	-	-	-	-
	Village 3	207,000	90	-	25,137,000	12,568,500
	Village 4	-	-	-	-	-
	Village 5	202,500	81	-	25,515,000	12,757,500
	Village 6	-	-	-	-	-
	Village 7	203,000	70	-	28,175,000	14,087,500
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**612,500**	**241**	**-**	**78,827,000**	**39,413,500**

APPENDIX 1
BUILDOUT ASSUMPTIONS

YEAR	USE TYPE	SQUARE FEET BUILT	# OF UNITS BUILT	ADDED LAND VALUE	ADDED IMPROVEMENTS VALUE	CONSTRUCTION MATERIALS COST
TOTAL		**3,077,470**	**1,223**	**$ 80,876,963**	**$ 380,221,717**	**$ 190,110,858**

APPENDIX 1, ASSUMPTIONS:

1. The following land and building costs represent the Developer's best estimate in 2017. Analysis adds land value in the year before construction and improvement value in the year of construction.

a) Residential:

	# of Acres	# of Units	Total Square Feet	Projected Sales Price/Unit	Land Value/ Unit	Improv. Value/ Unit
Village 1	9.90	89	169,100	$ 299,000	$ 44,850	$ 209,300
Village 2	12.20	110	220,000	299,000	44,850	209,300
Village 3	25.70	180	414,000	399,000	59,850	279,300
Village 4	28.00	197	453,100	399,000	59,850	279,300
Village 5	73.00	406	1,015,000	450,000	67,500	315,000
Village 6	37.70	171	461,700	499,000	74,850	349,300
Village 7	10.00	70	203,000	575,000	86,250	402,500
	196.50	**1,223**	**2,935,900**			

Source: Number of acres, units, square footage, and projected sales price from Developer. Land and improvement value based on values for homes sold at similar prices in City of Sparks in 2016 and 2017. Source: Washoe County Assessor's website.

b) Commercial:

	# of Acres	Total Square Feet	Improvements Cost/Sq. Ft.	Land Value/ Acre
General Comm.	13.0	141,570	$ 123.5	$ 158,881

Source: Number of acres and square footage from Developer. Land and improvement value from comparable uses (LU400) around the project. Source: Washoe County Assessor's website.

c) Open Space:

Open Space, estimated at **177.4** acres is expected to be valued using value per acre of **$ 6,095** for similar uses (LU 100) surrounding the project. Source: Washoe County Assessor's Office.
Existing value of the project cannot be used as it is valued as a quarry.

2. Construction Materials Cost is estimated at **50%** of Building Cost. Source: Discussions with contractors.

APPENDIX 2
CITY OF SPARKS
ESTIMATED NUMBER OF RESIDENTS AND EMPLOYEES

YEAR	USE TYPE	# OF UNITS BUILT	CUMUL. # OF OCCUPIED UNITS	SQUARE FEET CONSTRUCTED	CUMUL. NO. OF RESIDENTS	CUMUL. NO. OF EMPLOYEES	% OF SPARKS POPULATION
2018	Village 1	-	-	-	-	-	0.00%
	Village 2	-	-	-	-	-	0.00%
	Village 3	-	-	-	-	-	0.00%
	Village 4	-	-	-	-	-	0.00%
	Village 5	-	-	-	-	-	0.00%
	Village 6	-	-	-	-	-	0.00%
	Village 7	-	-	-	-	-	0.00%
	Gen. Commercial	-	-	-			0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**-**	**-**	**-**	**-**	**-**	**0.00%**
2019	Village 1	45	-	85,500	-	-	0.00%
	Village 2	55	-	110,000	-	-	0.00%
	Village 3	-	-	-	-	-	0.00%
	Village 4	66	-	151,800	-	-	0.00%
	Village 5	82	-	205,000	-	-	0.00%
	Village 6	-	-	-	-	-	0.00%
	Village 7	-	-	-	-	-	0.00%
	Gen. Commercial	-	-	87,120	-	104	0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**248**	**-**	**639,420**	**-**	**104**	**0.00%**
2020	Village 1	44	43	83,600	121	-	0.13%
	Village 2	55	53	110,000	148	-	0.16%
	Village 3	-	-	-	-	-	0.00%
	Village 4	66	64	151,800	178	-	0.19%
	Village 5	81	79	202,500	221	-	0.24%
	Village 6	-	-	-	-	-	0.00%
	Village 7	-	-	-	-	-	0.00%
	Gen. Commercial	-	-	54,450	-	169	0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**246**	**239**	**602,350**	**668**	**169**	**0.71%**
2021	Village 1	-	86	-	240	-	0.26%
	Village 2	-	106	-	296	-	0.32%
	Village 3	-	-	-	-	-	0.00%
	Village 4	65	127	149,500	355	-	0.38%
	Village 5	81	157	202,500	439	-	0.47%
	Village 6	86	-	232,200	-	-	0.00%
	Village 7	-	-	-	-	-	0.00%
	Gen. Commercial	-	-	-	-	169	0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**232**	**477**	**584,200**	**1,330**	**169**	**1.42%**
2022	Village 1	-	86	-	240	-	0.26%
	Village 2	-	106	-	296	-	0.32%
	Village 3	90	-	207,000	-	-	0.00%
	Village 4	-	190	-	530	-	0.57%
	Village 5	81	235	202,500	657	-	0.70%
	Village 6	85	83	229,500	232	-	0.25%
	Village 7	-	-	-	-	-	0.00%
	Gen. Commercial	-	-	-	-	169	0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**256**	**701**	**639,000**	**1,955**	**169**	**2.09%**
2023	Village 1	-	86	-	240	-	0.26%
	Village 2	-	106	-	296	-	0.32%
	Village 3	90	87	207,000	242	-	0.26%
	Village 4	-	190	-	530	-	0.57%
	Village 5	81	314	202,500	875	-	0.94%
	Village 6	-	165	-	460	-	0.49%
	Village 7	70	-	203,000	-	-	0.00%
	Gen. Commercial	-	-	-	-	169	0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**241**	**948**	**612,500**	**2,644**	**169**	**2.83%**

APPENDIX 2
CITY OF SPARKS
ESTIMATED NUMBER OF RESIDENTS AND EMPLOYEES

2024	Village 1	-	86	-	240	-	0.26%
	Village 2	-	106	-	296	-	0.32%
	Village 3	-	174	-	485	-	0.52%
	Village 4	-	190	-	530	-	0.57%
	Village 5	-	392	-	1,093	-	1.17%
	Village 6	-	165	-	460	-	0.49%
	Village 7	-	68	-	188	-	0.20%
	Gen. Commercial	-	-	-	-	169	0.00%
	Open Space	-	-	-	-	-	0.00%
Subtotal		**-**	**1,180**	**-**	**3,293**	**169**	**3.52%**
TOTAL		**1,223**		**3,077,470**			

APPENDIX 2, ASSUMPTIONS:

1. Number of residential units and square feet of buildings from Appendix 1.
2. Occupied single-family units are estimated using a vacancy rate of 3.5% to account for household movement and other timing issues. Households are assumed to be occupied a year after construction. Source: Center for Regional Studies, University of Nevada, Reno, based on data from the American Community Survey.
3. Residents are estimated using a ratio of **2.79** residents per occupied household/unit for owner-occupied units
   Source: "Average Household Size of Occupied Units by Tenure." 2016 American Community Survey 1-Year Estimates, US Census Bureau. Data for Sparks, Nevada.
4. Employee estimates from the Center for Regional Studies, UNR (CRS). Employees added in the year of construction.

Use Type	Project Square Feet	Sq.Ft./Employee	Employee Estimate
Gen Commercial	141,570	837	169

5. Impacts: Analysis estimates costs and revenues associated with the development using estimated number of new development residents only. The analysis assumes employees of the development will be existing residents of the region, residents of other regions, or residents of the development.
6. City of Sparks FY 2016-17 population is estimated at **93,581** Source: City of Sparks Budget, FY 2017-18. This is used to estimate the percent of existing population generated by the project.

APPENDIX 3
CITY OF SPARKS
ESTIMATED REAL PROPERTY TAX REVENUE

YEAR	USE TYPE	ADDED TAX. LAND VALUE ($)	ADDED TAX. IMPROVEMENT VALUE ($)	CUMULATIVE TOTAL TAX. VALUE ($)	CUMULATIVE ASSESSED VALUE ($)	GENERAL FUND REVENUE	AB 104 REVENUE
2018	Village 1	$ 2,018,250	$ -	$ 2,018,250	$ 706,388	$ 6,780	$ 14
	Village 2	2,466,750	-	2,466,750	863,363	8,287	18
	Village 3	-	-	-	-	-	-
	Village 4	3,950,100	-	3,950,100	1,382,535	13,270	28
	Village 5	5,535,000	-	5,535,000	1,937,250	18,594	39
	Village 6	-	-	-	-	-	-
	Village 7	-	-	-	-	-	-
	Gen. Commercial	1,271,044	-	1,271,044	444,866	4,270	9
	Open Space	1,081,066	-	1,081,066	378,373	3,632	8
Subtotal		**16,322,211**	**-**	**16,322,211**	**5,712,774**	**54,831**	**116**
2019	Village 1	1,973,400	9,418,500	4,052,198	1,418,269	13,613	29
	Village 2	2,466,750	11,511,500	5,007,503	1,752,626	16,822	36
	Village 3	-	-	-	-	-	-
	Village 4	3,950,100	18,433,800	8,018,703	2,806,546	26,937	57
	Village 5	5,467,500	25,830,000	11,168,550	3,908,993	37,519	80
	Village 6	-	-	-	-	-	-
	Village 7	-	-	-	-	-	-
	Gen. Commercial	794,403	10,756,687	2,103,578	736,252	7,067	15
	Open Space	-	-	1,113,498	389,724	3,741	8
Subtotal		**14,652,153**	**75,950,487**	**31,464,030**	**11,012,410**	**105,697**	**224**
2020	Village 1	-	9,209,200	13,874,818	4,856,186	46,610	99
	Village 2	-	11,511,500	17,014,573	5,955,100	57,157	121
	Village 3	-	-	-	-	-	-
	Village 4	3,890,250	18,433,800	31,136,328	10,897,715	104,596	222
	Village 5	5,467,500	25,515,000	43,576,007	15,251,602	146,385	311
	Village 6	6,437,100	-	6,437,100	2,252,985	21,624	46
	Village 7	-	-	-	-	-	-
	Gen. Commercial	-	6,722,930	13,246,074	4,636,126	44,498	94
	Open Space	-	-	1,146,903	401,416	3,853	8
Subtotal		**15,794,850**	**71,392,430**	**126,431,802**	**44,251,131**	**424,722**	**902**
2021	Village 1	-	-	23,776,539	8,321,789	79,873	170
	Village 2	-	-	29,381,855	10,283,649	98,702	210
	Village 3	5,386,500	-	5,386,500	1,885,275	18,095	38
	Village 4	-	18,154,500	51,057,232	17,870,031	171,517	364
	Village 5	5,467,500	25,515,000	76,631,237	26,820,933	257,427	546
	Village 6	6,362,250	30,039,800	12,992,463	4,547,362	43,646	93
	Village 7	-	-	-	-	-	-
	Gen. Commercial	-	-	20,568,073	7,198,826	69,094	147
	Open Space	-	-	1,181,310	413,459	3,968	8
Subtotal		**17,216,250**	**73,709,300**	**220,975,209**	**77,341,323**	**742,322**	**1,576**
2022	Village 1	-	-	24,489,835	8,571,442	82,269	175
	Village 2	-	-	30,263,310	10,592,159	101,664	216
	Village 3	5,386,500	25,137,000	10,934,595	3,827,108	36,733	78
	Village 4	-	-	71,288,084	24,950,829	239,478	508
	Village 5	5,467,500	25,515,000	110,678,124	38,737,343	371,801	789
	Village 6	-	29,690,500	44,323,231	15,513,131	148,895	316
	Village 7	6,037,500	-	6,037,500	2,113,125	20,282	43
	Gen. Commercial	-	-	21,185,116	7,414,790	71,167	151
	Open Space	-	-	1,216,750	425,862	4,087	9
Subtotal		**16,891,500**	**80,342,500**	**320,416,544**	**112,145,790**	**1,076,375**	**2,285**
2023	Village 1	-	-	25,224,530	8,828,586	84,737	180
	Village 2	-	-	31,171,210	10,909,923	104,713	222
	Village 3	-	25,137,000	37,153,743	13,003,810	124,811	265
	Village 4	-	-	73,426,726	25,699,354	246,662	524
	Village 5	-	25,515,000	140,278,918	49,097,621	471,239	1,000
	Village 6	-	-	76,234,143	26,681,950	256,093	544
	Village 7	-	28,175,000	6,218,625	2,176,519	20,890	44
	Gen. Commercial	-	-	21,820,669	7,637,234	73,302	156
	Open Space	-	-	1,253,252	438,638	4,210	9
Subtotal		**-**	**78,827,000**	**412,781,816**	**144,473,635**	**1,386,658**	**2,943**

APPENDIX 3
CITY OF SPARKS
ESTIMATED REAL PROPERTY TAX REVENUE

YEAR	USE TYPE	ADDED TAX. LAND VALUE ($)	ADDED TAX. IMPROVEMENT VALUE ($)	CUMULATIVE TOTAL TAX. VALUE ($)	CUMULATIVE ASSESSED VALUE ($)	GENERAL FUND REVENUE	AB 104 REVENUE
2024	Village 1	-	-	25,981,266	9,093,443	87,279	185
	Village 2	-	-	32,106,346	11,237,221	107,855	229
	Village 3	-	-	64,159,465	22,455,813	215,531	458
	Village 4	-	-	75,629,528	26,470,335	254,062	539
	Village 5	-	-	170,767,735	59,768,707	573,660	1,218
	Village 6	-	-	78,521,167	27,482,408	263,776	560
	Village 7	-	-	35,425,434	12,398,902	119,005	253
	Gen. Commercial	-	-	22,475,289	7,866,351	75,501	160
	Open Space	-	-	1,290,850	451,797	4,336	9
Subtotal		**-**	**-**	**506,357,080**	**177,224,978**	**1,701,005**	**3,611**
2025	Village 1	-	-	26,760,704	9,366,246	89,897	191
	Village 2	-	-	33,069,536	11,574,338	111,090	236
	Village 3	-	-	66,084,249	23,129,487	221,997	471
	Village 4	-	-	77,898,414	27,264,445	261,684	555
	Village 5	-	-	175,890,767	61,561,768	590,870	1,254
	Village 6	-	-	80,876,802	28,306,881	271,689	577
	Village 7	-	-	36,488,197	12,770,869	122,575	260
	Gen. Commercial	-	-	23,149,548	8,102,342	77,766	165
	Open Space	-	-	1,329,575	465,351	4,466	9
Subtotal		**-**	**-**	**521,547,792**	**182,541,727**	**1,752,035**	**3,719**
2026	Village 1	-	-	27,563,525	9,647,234	92,594	197
	Village 2	-	-	34,061,622	11,921,568	114,423	243
	Village 3	-	-	68,066,777	23,823,372	228,657	485
	Village 4	-	-	80,235,366	28,082,378	269,535	572
	Village 5	-	-	181,167,490	63,408,622	608,596	1,292
	Village 6	-	-	83,303,106	29,156,087	279,840	594
	Village 7	-	-	37,582,843	13,153,995	126,252	268
	Gen. Commercial	-	-	23,844,034	8,345,412	80,099	170
	Open Space	-	-	1,369,462	479,312	4,600	10
Subtotal		**-**	**-**	**537,194,226**	**188,017,979**	**1,804,597**	**3,831**
2027	Village 1	-	-	28,390,431	9,936,651	95,372	202
	Village 2	-	-	35,083,471	12,279,215	117,856	250
	Village 3	-	-	70,108,780	24,538,073	235,516	500
	Village 4	-	-	82,642,427	28,924,850	277,621	589
	Village 5	-	-	186,602,515	65,310,880	626,854	1,331
	Village 6	-	-	85,802,199	30,030,770	288,235	612
	Village 7	-	-	38,710,328	13,548,615	130,040	276
	Gen. Commercial	-	-	24,559,355	8,595,774	82,502	175
	Open Space	-	-	1,410,546	493,691	4,738	10
Subtotal		**-**	**-**	**553,310,053**	**193,658,519**	**1,858,734**	**3,946**
2028	Village 1	-	-	29,242,144	10,234,750	98,233	209
	Village 2	-	-	36,135,975	12,647,591	121,392	258
	Village 3	-	-	72,212,043	25,274,215	242,582	515
	Village 4	-	-	85,121,700	29,792,595	285,949	607
	Village 5	-	-	192,200,590	67,270,207	645,659	1,371
	Village 6	-	-	88,376,265	30,931,693	296,882	630
	Village 7	-	-	39,871,638	13,955,073	133,941	284
	Gen. Commercial	-	-	25,296,136	8,853,648	84,977	180
	Open Space	-	-	1,452,863	508,502	4,881	10
Subtotal		**-**	**-**	**569,909,355**	**199,468,274**	**1,914,496**	**4,064**
2029	Village 1	-	-	30,119,408	10,541,793	101,180	215
	Village 2	-	-	37,220,055	13,027,019	125,033	265
	Village 3	-	-	74,378,405	26,032,442	249,859	530
	Village 4	-	-	87,675,351	30,686,373	294,528	625
	Village 5	-	-	197,966,608	69,288,313	665,029	1,412
	Village 6	-	-	91,027,553	31,859,644	305,789	649
	Village 7	-	-	41,067,787	14,373,725	137,959	293
	Gen. Commercial	-	-	26,055,020	9,119,257	87,527	186
	Open Space	-	-	1,496,448	523,757	5,027	11
Subtotal		**-**	**-**	**587,006,635**	**205,452,322**	**1,971,931**	**4,186**

APPENDIX 3
CITY OF SPARKS
ESTIMATED REAL PROPERTY TAX REVENUE

YEAR	USE TYPE	ADDED TAX. LAND VALUE ($)	ADDED TAX. IMPROVEMENT VALUE ($)	CUMULATIVE TOTAL TAX. VALUE ($)	CUMULATIVE ASSESSED VALUE ($)	GENERAL FUND REVENUE	AB 104 REVENUE
2030	Village 1	-	-	31,022,990	10,858,047	104,216	221
	Village 2	-	-	38,336,656	13,417,830	128,784	273
	Village 3	-	-	76,609,757	26,813,415	257,355	546
	Village 4	-	-	90,305,612	31,606,964	303,364	644
	Village 5	-	-	203,905,606	71,366,962	684,980	1,454
	Village 6	-	-	93,758,380	32,815,433	314,963	669
	Village 7	-	-	42,299,821	14,804,937	142,098	302
	Gen. Commercial	-	-	26,836,671	9,392,835	90,152	191
	Open Space	-	-	1,541,342	539,470	5,178	11
Subtotal		**-**	**-**	**604,616,834**	**211,615,892**	**2,031,089**	**4,311**
2031	Village 1	-	-	31,953,680	11,183,788	107,342	228
	Village 2	-	-	39,486,756	13,820,365	132,648	282
	Village 3	-	-	78,908,049	27,617,817	265,076	563
	Village 4	-	-	93,014,780	32,555,173	312,465	663
	Village 5	-	-	210,022,774	73,507,971	705,530	1,498
	Village 6	-	-	96,571,131	33,799,896	324,411	689
	Village 7	-	-	43,568,815	15,249,085	146,361	311
	Gen. Commercial	-	-	27,641,771	9,674,620	92,857	197
	Open Space	-	-	1,587,582	555,654	5,333	11
Subtotal		**-**	**-**	**622,755,339**	**217,964,369**	**2,092,022**	**4,441**
2032	Village 1	-	-	32,912,291	11,519,302	110,562	235
	Village 2	-	-	40,671,359	14,234,975	136,627	290
	Village 3	-	-	81,275,291	28,446,352	273,028	580
	Village 4	-	-	95,805,224	33,531,828	321,838	683
	Village 5	-	-	216,323,458	75,713,210	726,695	1,543
	Village 6	-	-	99,468,265	34,813,893	334,144	709
	Village 7	-	-	44,875,880	15,706,558	150,752	320
	Gen. Commercial	-	-	28,471,024	9,964,858	95,643	203
	Open Space	-	-	1,635,210	572,323	5,493	12
Subtotal		**-**	**-**	**641,438,000**	**224,503,300**	**2,154,783**	**4,574**
2033	Village 1	-	-	33,899,659	11,864,881	113,879	242
	Village 2	-	-	41,891,499	14,662,025	140,726	299
	Village 3	-	-	83,713,550	29,299,742	281,219	597
	Village 4	-	-	98,679,380	34,537,783	331,494	704
	Village 5	-	-	222,813,161	77,984,606	748,496	1,589
	Village 6	-	-	102,452,313	35,858,310	344,168	731
	Village 7	-	-	46,222,156	16,177,755	155,274	330
	Gen. Commercial	-	-	29,325,155	10,263,804	98,512	209
	Open Space	-	-	1,684,266	589,493	5,658	12
Subtotal		**-**	**-**	**660,681,140**	**231,238,399**	**2,219,426**	**4,711**
2034	Village 1	-	-	34,916,649	12,220,827	117,295	249
	Village 2	-	-	43,148,244	15,101,885	144,948	308
	Village 3	-	-	86,224,956	30,178,735	289,655	615
	Village 4	-	-	101,639,762	35,573,917	341,438	725
	Village 5	-	-	229,497,556	80,324,145	770,951	1,637
	Village 6	-	-	105,525,883	36,934,059	354,493	752
	Village 7	-	-	47,608,821	16,663,087	159,932	339
	Gen. Commercial	-	-	30,204,909	10,571,718	101,467	215
	Open Space	-	-	1,734,794	607,178	5,828	12
Subtotal		**-**	**-**	**680,501,574**	**238,175,551**	**2,286,009**	**4,853**
2035	Village 1	-	-	35,964,149	12,587,452	120,814	256
	Village 2	-	-	44,442,692	15,554,942	149,296	317
	Village 3	-	-	88,811,705	31,084,097	298,345	633
	Village 4	-	-	104,688,955	36,641,134	351,682	747
	Village 5	-	-	236,382,483	82,733,869	794,080	1,686
	Village 6	-	-	108,691,659	38,042,081	365,128	775
	Village 7	-	-	49,037,085	17,162,980	164,730	350
	Gen. Commercial	-	-	31,111,056	10,888,870	104,511	222
	Open Space	-	-	1,786,838	625,393	6,003	13
Subtotal		**-**	**-**	**700,916,621**	**245,320,817**	**2,354,589**	**4,998**

APPENDIX 3
CITY OF SPARKS
ESTIMATED REAL PROPERTY TAX REVENUE

YEAR	USE TYPE	ADDED TAX. LAND VALUE ($)	ADDED TAX. IMPROVEMENT VALUE ($)	CUMULATIVE TOTAL TAX. VALUE ($)	CUMULATIVE ASSESSED VALUE ($)	GENERAL FUND REVENUE	AB 104 REVENUE
2036	Village 1	-	-	37,043,073	12,965,076	124,439	264
	Village 2	-	-	45,775,972	16,021,590	153,775	326
	Village 3	-	-	91,476,056	32,016,620	307,296	652
	Village 4	-	-	107,829,623	37,740,368	362,232	769
	Village 5	-	-	243,473,957	85,215,885	817,902	1,736
	Village 6	-	-	111,952,409	39,183,343	376,082	798
	Village 7	-	-	50,508,198	17,677,869	169,672	360
	Gen. Commercial	-	-	32,044,388	11,215,536	107,647	229
	Open Space	-	-	1,840,443	644,155	6,183	13
Subtotal		**-**	**-**	**721,944,120**	**252,680,442**	**2,425,227**	**5,148**
2037	Village 1	-	-	38,154,365	13,354,028	128,172	272
	Village 2	-	-	47,149,252	16,502,238	158,388	336
	Village 3	-	-	94,220,338	32,977,118	316,514	672
	Village 4	-	-	111,064,512	38,872,579	373,099	792
	Village 5	-	-	250,778,176	87,772,362	842,439	1,788
	Village 6	-	-	115,310,981	40,358,843	387,364	822
	Village 7	-	-	52,023,444	18,208,205	174,762	371
	Gen. Commercial	-	-	33,005,720	11,552,002	110,876	235
	Open Space	-	-	1,895,656	663,480	6,368	14
Subtotal		**-**	**-**	**743,602,443**	**260,260,855**	**2,497,984**	**5,302**
TOTAL		**$ 80,876,963**	**$ 380,221,717**			**$ 32,854,535**	**$ 69,741**

APPENDIX 3, ASSUMPTIONS:

1. As the project is not currently located in the City of Sparks, all property tax revenue generated by the project will be net new to the City.
2. Taxable value of land and improvements is estimated in Appendix 1.
3. Land and improvement taxable values are inflated by **3.0%** annually, the maximum allowed increase for owner-occupied properties. This may be conservative for commercial uses in the project, which can increase up to 8% per year.
4. Property tax calculation: Taxable Value X 35% = Assessed Value; Assessed Value/100 X Tax Rate = Property Tax Revenue.
   Analysis assumes improvements will generate property tax revenue in the year after improvements are made to account for work-in-progress.
   Land values will generate property tax in the year as developed.
5. City of Sparks General Fund operating tax rate is assumed to remain constant at FY 2017-18 rate of **$ 0.9598** per $100 of value.
   Source: City of Sparks Budget, FY 2017-18.
6. City of Sparks is expected to receive **7.49%** of property tax revenue generated by the AB 104 property tax rate of **$ 0.0272** Source: Nevada Department of Taxation. "Local Gov't Tax Act Distribution." Three-year average FY 2014-15, FY 2015-16, and 2016-17.

APPENDIX 4
CITY OF SPARKS
ESTIMATED SALES TAX REVENUE

YEAR	USE TYPE	CONSTR. MATERIALS COST	HOUSEHOLD EXPENDITURES	TOTAL TAXABLE SALES	CCRT SALES TAX REVENUE	AB 104 SALES TAX REVENUE
2018	Village 1	$ -	$ -	$ -	$ -	$ -
	Village 2	-	-	-	-	-
	Village 3	-	-	-	-	-
	Village 4	-	-	-	-	-
	Village 5	-	-	-	-	-
	Village 6	-	-	-	-	-
	Village 7	-	-	-	-	-
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**-**	**-**	**-**	**-**
2019	Village 1	4,709,250	-	4,709,250	12,624	866
	Village 2	5,755,750	-	5,755,750	15,429	1,059
	Village 3	-	-	-	-	-
	Village 4	9,216,900	-	9,216,900	24,707	1,696
	Village 5	12,915,000	-	12,915,000	34,620	2,376
	Village 6	-	-	-	-	-
	Village 7	-	-	-	-	-
	Gen. Commercial	5,378,344	-	5,378,344	14,417	990
	Open Space	-	-	-	-	-
Subtotal		**37,975,244**	**-**	**37,975,244**	**101,796**	**6,987**
2020	Village 1	4,604,600	801,371	5,405,971	14,491	995
	Village 2	5,755,750	979,454	6,735,204	18,054	1,239
	Village 3	-	-	-	-	-
	Village 4	9,216,900	1,330,032	10,546,932	28,272	1,940
	Village 5	12,757,500	1,844,332	14,601,832	39,141	2,686
	Village 6	-	-	-	-	-
	Village 7	-	-	-	-	-
	Gen. Commercial	3,361,465	-	3,361,465	9,011	618
	Open Space	-	-	-	-	-
Subtotal		**35,696,215**	**4,955,188**	**40,651,403**	**108,970**	**7,479**
2021	Village 1	-	1,632,482	1,632,482	4,376	300
	Village 2	-	2,017,674	2,017,674	5,409	371
	Village 3	-	-	-	-	-
	Village 4	9,077,250	2,739,865	11,817,115	31,677	2,174
	Village 5	12,757,500	3,776,157	16,533,657	44,320	3,042
	Village 6	15,019,900	-	15,019,900	40,262	2,763
	Village 7	-	-	-	-	-
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**36,854,650**	**10,166,178**	**47,020,828**	**126,043**	**8,651**
2022	Village 1	-	1,681,456	1,681,456	4,507	309
	Village 2	-	2,078,205	2,078,205	5,571	382
	Village 3	12,568,500	-	12,568,500	33,691	2,312
	Village 4	-	4,211,712	4,211,712	11,290	775
	Village 5	12,757,500	5,822,231	18,579,731	49,805	3,418
	Village 6	14,845,250	2,257,208	17,102,458	45,845	3,147
	Village 7	-	-	-	-	-
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**40,171,250**	**16,050,813**	**56,222,063**	**150,708**	**10,344**
2023	Village 1	-	1,731,900	1,731,900	4,643	319
	Village 2	-	2,140,551	2,140,551	5,738	394
	Village 3	12,568,500	1,981,857	14,550,357	39,003	2,677
	Village 4	-	4,338,064	4,338,064	11,629	798
	Village 5	12,757,500	7,987,672	20,745,172	55,609	3,817
	Village 6	-	4,622,815	4,622,815	12,392	851
	Village 7	14,087,500	-	14,087,500	37,763	2,592
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**39,413,500**	**22,802,858**	**62,216,358**	**166,776**	**11,447**

APPENDIX 4
CITY OF SPARKS
ESTIMATED SALES TAX REVENUE

YEAR	USE TYPE	CONSTR. MATERIALS COST	HOUSEHOLD EXPENDITURES	TOTAL TAXABLE SALES	CCRT SALES TAX REVENUE	AB 104 SALES TAX REVENUE
2024	Village 1	-	1,783,857	1,783,857	4,782	328
	Village 2	-	2,204,767	2,204,767	5,910	406
	Village 3	-	4,082,625	4,082,625	10,944	751
	Village 4	-	4,468,206	4,468,206	11,977	822
	Village 5	-	10,277,799	10,277,799	27,551	1,891
	Village 6	-	4,761,500	4,761,500	12,764	876
	Village 7	-	2,006,944	2,006,944	5,380	369
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**29,585,697**	**29,585,697**	**79,307**	**5,443**
2025	Village 1	-	1,837,373	1,837,373	4,925	338
	Village 2	-	2,270,910	2,270,910	6,087	418
	Village 3	-	4,205,103	4,205,103	11,272	774
	Village 4	-	4,602,252	4,602,252	12,337	847
	Village 5	-	10,586,133	10,586,133	28,377	1,948
	Village 6	-	4,904,344	4,904,344	13,147	902
	Village 7	-	2,067,153	2,067,153	5,541	380
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**30,473,268**	**30,473,268**	**81,686**	**5,607**
2026	Village 1	-	1,892,494	1,892,494	5,073	348
	Village 2	-	2,339,038	2,339,038	6,270	430
	Village 3	-	4,331,256	4,331,256	11,610	797
	Village 4	-	4,740,320	4,740,320	12,707	872
	Village 5	-	10,903,716	10,903,716	29,228	2,006
	Village 6	-	5,051,475	5,051,475	13,541	929
	Village 7	-	2,129,167	2,129,167	5,707	392
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**31,387,466**	**31,387,466**	**84,137**	**5,775**
2027	Village 1	-	1,949,269	1,949,269	5,225	359
	Village 2	-	2,409,209	2,409,209	6,458	443
	Village 3	-	4,461,194	4,461,194	11,959	821
	Village 4	-	4,882,529	4,882,529	13,088	898
	Village 5	-	11,230,828	11,230,828	30,105	2,066
	Village 6	-	5,203,019	5,203,019	13,947	957
	Village 7	-	2,193,042	2,193,042	5,879	403
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**32,329,090**	**32,329,090**	**86,661**	**5,948**
2028	Village 1	-	2,007,747	2,007,747	5,382	369
	Village 2	-	2,481,485	2,481,485	6,652	457
	Village 3	-	4,595,030	4,595,030	12,317	845
	Village 4	-	5,029,005	5,029,005	13,481	925
	Village 5	-	11,567,753	11,567,753	31,008	2,128
	Village 6	-	5,359,110	5,359,110	14,366	986
	Village 7	-	2,258,833	2,258,833	6,055	416
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**33,298,963**	**33,298,963**	**89,261**	**6,126**
2029	Village 1	-	2,067,979	2,067,979	5,543	380
	Village 2	-	2,555,930	2,555,930	6,851	470
	Village 3	-	4,732,881	4,732,881	12,687	871
	Village 4	-	5,179,875	5,179,875	13,885	953
	Village 5	-	11,914,785	11,914,785	31,939	2,192
	Village 6	-	5,519,883	5,519,883	14,797	1,016
	Village 7	-	2,326,598	2,326,598	6,237	428
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**34,297,932**	**34,297,932**	**91,939**	**6,310**

APPENDIX 4
CITY OF SPARKS
ESTIMATED SALES TAX REVENUE

YEAR	USE TYPE	CONSTR. MATERIALS COST	HOUSEHOLD EXPENDITURES	TOTAL TAXABLE SALES	CCRT SALES TAX REVENUE	AB 104 SALES TAX REVENUE
2030	Village 1	-	2,130,019	2,130,019	5,710	392
	Village 2	-	2,632,607	2,632,607	7,057	484
	Village 3	-	4,874,867	4,874,867	13,068	897
	Village 4	-	5,335,271	5,335,271	14,302	982
	Village 5	-	12,272,229	12,272,229	32,897	2,258
	Village 6	-	5,685,479	5,685,479	15,240	1,046
	Village 7	-	2,396,396	2,396,396	6,424	441
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**35,326,870**	**35,326,870**	**94,697**	**6,499**
2031	Village 1	-	2,193,919	2,193,919	5,881	404
	Village 2	-	2,711,586	2,711,586	7,269	499
	Village 3	-	5,021,113	5,021,113	13,460	924
	Village 4	-	5,495,330	5,495,330	14,731	1,011
	Village 5	-	12,640,396	12,640,396	33,884	2,326
	Village 6	-	5,856,044	5,856,044	15,698	1,077
	Village 7	-	2,468,288	2,468,288	6,616	454
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**36,386,676**	**36,386,676**	**97,538**	**6,694**
2032	Village 1	-	2,259,737	2,259,737	6,057	416
	Village 2	-	2,792,933	2,792,933	7,487	514
	Village 3	-	5,171,747	5,171,747	13,863	952
	Village 4	-	5,660,189	5,660,189	15,173	1,041
	Village 5	-	13,019,608	13,019,608	34,900	2,395
	Village 6	-	6,031,725	6,031,725	16,169	1,110
	Village 7	-	2,542,337	2,542,337	6,815	468
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**37,478,276**	**37,478,276**	**100,464**	**6,895**
2033	Village 1	-	2,327,529	2,327,529	6,239	428
	Village 2	-	2,876,721	2,876,721	7,711	529
	Village 3	-	5,326,899	5,326,899	14,279	980
	Village 4	-	5,829,995	5,829,995	15,628	1,073
	Village 5	-	13,410,196	13,410,196	35,947	2,467
	Village 6	-	6,212,677	6,212,677	16,654	1,143
	Village 7	-	2,618,607	2,618,607	7,019	482
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**38,602,624**	**38,602,624**	**103,478**	**7,102**
2034	Village 1	-	2,397,355	2,397,355	6,426	441
	Village 2	-	2,963,023	2,963,023	7,943	545
	Village 3	-	5,486,706	5,486,706	14,708	1,009
	Village 4	-	6,004,895	6,004,895	16,097	1,105
	Village 5	-	13,812,502	13,812,502	37,026	2,541
	Village 6	-	6,399,057	6,399,057	17,153	1,177
	Village 7	-	2,697,165	2,697,165	7,230	496
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**39,760,703**	**39,760,703**	**106,582**	**7,315**
2035	Village 1	-	2,469,276	2,469,276	6,619	454
	Village 2	-	3,051,914	3,051,914	8,181	561
	Village 3	-	5,651,307	5,651,307	15,149	1,040
	Village 4	-	6,185,042	6,185,042	16,580	1,138
	Village 5	-	14,226,877	14,226,877	38,136	2,617
	Village 6	-	6,591,029	6,591,029	17,668	1,213
	Village 7	-	2,778,080	2,778,080	7,447	511
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**40,953,524**	**40,953,524**	**109,779**	**7,535**

APPENDIX 4
CITY OF SPARKS
ESTIMATED SALES TAX REVENUE

YEAR	USE TYPE	CONSTR. MATERIALS COST	HOUSEHOLD EXPENDITURES	TOTAL TAXABLE SALES	CCRT SALES TAX REVENUE	AB 104 SALES TAX REVENUE
2036	Village 1	-	2,543,354	2,543,354	6,818	468
	Village 2	-	3,143,471	3,143,471	8,426	578
	Village 3	-	5,820,846	5,820,846	15,603	1,071
	Village 4	-	6,370,593	6,370,593	17,077	1,172
	Village 5	-	14,653,683	14,653,683	39,280	2,696
	Village 6	-	6,788,760	6,788,760	18,198	1,249
	Village 7	-	2,861,423	2,861,423	7,670	526
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**42,182,130**	**42,182,130**	**113,073**	**7,761**
2037	Village 1	-	2,619,654	2,619,654	7,022	482
	Village 2	-	3,237,775	3,237,775	8,679	596
	Village 3	-	5,995,472	5,995,472	16,071	1,103
	Village 4	-	6,561,711	6,561,711	17,589	1,207
	Village 5	-	15,093,294	15,093,294	40,459	2,777
	Village 6	-	6,992,423	6,992,423	18,744	1,286
	Village 7	-	2,947,265	2,947,265	7,900	542
	Gen. Commercial	-	-	-	-	-
	Open Space	-	-	-	-	-
Subtotal		**-**	**43,447,594**	**43,447,594**	**116,465**	**7,994**
TOTAL		**$ 190,110,858**	**$ 559,485,851**	**$ 749,596,709**	**$ 2,009,359**	**$ 137,912**

APPENDIX 4, ASSUMPTIONS:

1. Construction Materials Cost is estimated in Appendix 1.
2. Household Taxable Sales-estimated based on the number of occupied households, estimated household income, and expenditure information. Household incomes and percent of income spent on taxable items are estimated as follows, based on projected sales price for each village shown in Appendix 1:

	Household Income	% Spent on Taxable Items
Village 1	$ 61,316	27.5%
Village 2	$ 61,316	27.5%
Village 3	$ 79,390	24.1%
Village 4	$ 79,390	24.1%
Village 5	$ 88,608	24.1%
Village 6	$ 97,465	24.1%
Village 7	$ 111,201	21.7%

Affordability calculator created by EEC and Center for Regional Studies, UNR. Percent of household income spent on taxable items from Consumer Expenditure Survey, 2016, Bureau of Labor Statistics, data by corresponding household income range. Estimates are inflated 3% annually.

3. Relevant tax rates for the City of Sparks are as follows:
   0.500% Basic City County Relief Tax (BCCRT)
   1.750% Supplemental City County Relief Tax (SCCRT)
   0.250% Fair Share (AB 104)

   Distribution of BCCRT and SCCRT sales tax revenue to the City of Sparks is calculated **12.13%** of all Washoe County CCRT revenue.
   Source: Distribution based on average percentage share of Washoe County C-Tax distribution from FY 2014-15 to FY 2016-17. Data from Nevada Department of Taxation. "Consolidated Tax Distribution: Revenue Summary by County."
   Distribution of AB 104 sales tax revenue to the City of Sparks is calculated at **7.49%** of all Washoe County AB 104 revenue.
   Source: Distribution based on average percentage share of Washoe County AB104 distribution from FY 2014-15 to FY 2016-17. Data from Nevada Department of Taxation. "Local Government Tax Act Distribution."
4. A State administrative fee of **1.75%** of all sales tax revenue is subtracted for State uses. Source: AB 552.

APPENDIX 5
CITY OF SPARKS
ESTIMATED PERMIT AND IMPACT FEE REVENUE

YEAR	USE TYPE	ESTIMATED BUILDING VALUATION	PRINCIPAL AMOUNT	BUILDING PERMIT REVENUE	PLAN REVIEW REVENUE	CURRENT PLANNING REVENUE	FIRE INSPEC./ PLAN REVIEW REVENUE	REGIONAL ROAD REVENUE	SEWER CONNECT. REVENUE	RESIDENTIAL PARK TAX REVENUE	IMPACT FEE SERVICE AREA #1 SANITARY SEWER	FLOOD CONTROL	REGIONAL PARKS/REC	FIRE STATION	TOTAL
2018	Village 1	$ -	$ 72,262	$ 69,083	$ 28,905	$ 6,300	$ 31,795	$ 176,488	$ 264,388	$ 45,000	$ 13,365	$ 26,685	$ 35,010	$ 15,300	$ 90,360
	Village 2	-	88,321	84,435	35,328	7,700	38,861	215,708	323,140	55,000	16,335	32,615	42,790	18,700	110,440
	Village 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 4	-	131,857	126,055	52,743	9,240	58,017	258,849	387,768	66,000	19,602	39,138	51,348	22,440	132,528
	Village 5	-	180,216	172,286	72,086	11,480	79,295	321,601	481,773	82,000	24,354	48,626	63,796	27,880	164,656
	Village 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gen. Commercial	-	41,221	39,407	30,915	21,146	18,137	610,816	-	-	24,306	46,783	-	29,621	100,711
	Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		**-**	**513,876**	**491,265**	**219,978**	**55,866**	**226,105**	**1,583,462**	**1,457,069**	**248,000**	**97,962**	**193,847**	**192,944**	**113,941**	**598,695**
2019	Village 1	9,418,500	70,657	67,548	28,263	6,160	31,089	172,566	258,512	44,000	13,068	26,092	34,232	14,960	88,352
	Village 2	11,511,500	88,321	84,435	35,328	7,700	38,861	215,708	323,140	55,000	16,335	32,615	42,790	18,700	110,440
	Village 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 4	18,433,800	131,857	126,055	52,743	9,240	58,017	258,849	387,768	66,000	19,602	39,138	51,348	22,440	132,528
	Village 5	25,830,000	178,018	170,185	71,207	11,340	78,328	317,679	475,898	81,000	24,057	48,033	63,018	27,540	162,648
	Village 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gen. Commercial	10,756,687	26,497	25,332	19,873	13,593	11,659	381,760	-	-	15,192	29,240	-	18,513	62,944
	Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		**75,950,487**	**495,349**	**473,554**	**207,414**	**48,033**	**217,954**	**1,346,562**	**1,445,319**	**246,000**	**88,254**	**175,118**	**191,388**	**102,153**	**556,912**
2020	Village 1	9,209,200	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 2	11,511,500	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 4	18,433,800	129,859	124,145	51,944	9,100	57,138	254,927	381,893	65,000	19,305	38,545	50,570	22,100	130,520
	Village 5	25,515,000	178,018	170,185	71,207	11,340	78,328	317,679	475,898	81,000	24,057	48,033	63,018	27,540	162,648
	Village 6	-	205,525	196,482	82,210	12,040	90,431	337,289	505,274	86,000	25,542	50,998	66,908	29,240	172,688
	Village 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gen. Commercial	6,722,930	-	-	-	-	-	-	-	-	-	-	-	-	-
	Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		**71,392,430**	**513,402**	**490,812**	**205,361**	**32,480**	**225,897**	**909,895**	**1,363,065**	**232,000**	**68,904**	**137,576**	**180,496**	**78,880**	**465,856**
2021	Village 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 3	-	179,805	171,893	71,922	12,600	79,114	352,976	528,775	90,000	26,730	53,370	70,020	30,600	180,720
	Village 4	18,154,500	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 5	25,515,000	178,018	170,185	71,207	11,340	78,328	317,679	475,898	81,000	24,057	48,033	63,018	27,540	162,648
	Village 6	30,039,800	203,136	194,198	81,254	11,900	89,380	333,367	499,399	85,000	25,245	50,405	66,130	28,900	170,680
	Village 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gen. Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		**73,709,300**	**560,958**	**536,276**	**224,383**	**35,840**	**246,822**	**1,004,022**	**1,504,072**	**256,000**	**76,032**	**151,808**	**199,168**	**87,040**	**514,048**

APPENDIX 5
CITY OF SPARKS
ESTIMATED PERMIT AND IMPACT FEE REVENUE

YEAR	USE TYPE	ESTIMATED BUILDING VALUATION	PRINCIPAL AMOUNT	BUILDING PERMIT REVENUE	PLAN REVIEW REVENUE	CURRENT PLANNING REVENUE	FIRE INSPEC./ PLAN REVIEW REVENUE	REGIONAL ROAD REVENUE	SEWER CONNECT. REVENUE	RESIDENTIAL PARK TAX REVENUE	IMPACT FEE SERVICE AREA #1 SANITARY SEWER	FLOOD CONTROL	REGIONAL PARKS/REC	FIRE STATION	TOTAL
2022	Village 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 3	25,137,000	179,805	171,893	71,922	12,600	79,114	352,976	528,775	90,000	26,730	53,370	70,020	30,600	180,720
	Village 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 5	25,515,000	178,018	170,185	71,207	11,340	78,328	317,679	475,898	81,000	24,057	48,033	63,018	27,540	162,648
	Village 6	29,690,500	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 7	-	188,143	179,864	75,257	9,800	82,783	274,537	411,270	70,000	20,790	41,510	54,460	23,800	140,560
	Gen. Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		**80,342,500**	**545,965**	**521,942**	**218,386**	**33,740**	**240,225**	**945,192**	**1,415,942**	**241,000**	**71,577**	**142,913**	**187,498**	**81,940**	**483,928**
2023	Village 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 3	25,137,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 5	25,515,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Village 7	28,175,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gen. Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Open Space	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal		**78,827,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
TOTAL		**$ 380,221,717**	**$ 2,629,550**	**$ 2,513,850**	**$ 1,075,521**	**$ 205,959**	**$ 1,157,002**	**$ 5,789,133**	**$ 7,185,467**	**$ 1,223,000**	**$ 402,729**	**$ 801,262**	**$ 951,494**	**$ 463,954**	**$ 2,619,439**

APPENDIX 5, ASSUMPTIONS:

1. Building valuation is estimated in Appendix 1. It should be noted that permit fees associated with some residential uses are likely underestimated as construction values provided by the Client and used to estimate permit revenues for the projec are lower than those provided by the 2012 International Building Code.
2. Principal amount for the calculation of building permit and plan check fee revenue is estimated at follows, principal amount and resulting fees are estimated in the year prior to construction:
   $ 993.75 for the first $100,000.01 of Building Permit Valuation, plus **$ 5.60** for each additional $1,000 thereafter through a value of $500,000.
   $ 5,608.75 for the first $1,000,000.01 of Building Permit Valuation, plus **$ 3.65** for each additional $1,000 thereafter.
   Source: "City of Sparks Permit Fees." Revised October 9, 2017. As the number of commercial buildings is unknown, analysis conservatively assumes one building permit per year.
3. Building Permit fee revenue is estimated at **95.60%** of principal amount.
   Building Plan Review fee revenue is estimated at **75.00%** of principal amount, except for single family repeats, which are estimated at **40.00%** of the principal amount.
   Current Planning Plan Review fee revenue is estimated at **51.30%** of the principal amount, except for single family repeats, which are estimated a **$ 140.00** per building.
   Fire Prevention Inspection fee revenue is estimated at **22.00%** of the principal amount.
   Fire Prevention Plan review fee revenue is estimated at **22.00%** of the principal amount.
   Analysis conservatively assumes all single family homes are repeat units. Source: "City of Sparks Permit Fees." Revised October 9, 2017. Revenue for mechanical, plumbing, and electrical permit fees is not estimated as the construction detai required for these estimates are unknown.
4. Regional Road Impact fee (RRIF) revenue is estimated at:
   Single Family **$ 3,921.96** per dwelling unit.
   Commercial **$ 7,011.20** per 1,000 square feet of gross floor area.
   Source: "Regional Road Impact Fee (RRIF)." Regional Transportation Commission. 5th Edition, March 20, 2017. Data for North Service Area.
5. Sewer Connection fee revenue is estimated at **$ 5,875.28** per residential unit. Source: "City of Sparks Permit Fees." Revised October 9, 2017. Connection fees for commercial uses are not estimated as fixture information is not available.

APPENDIX 5
CITY OF SPARKS
ESTIMATED PERMIT AND IMPACT FEE REVENUE

YEAR	USE TYPE	ESTIMATED BUILDING VALUATION	PRINCIPAL AMOUNT	BUILDING PERMIT REVENUE	PLAN REVIEW REVENUE	CURRENT PLANNING REVENUE	FIRE INSPEC./ PLAN REVIEW REVENUE	REGIONAL ROAD REVENUE	SEWER CONNECT. REVENUE	RESIDENTIAL PARK TAX REVENUE	IMPACT FEE SERVICE AREA #1 SANITARY SEWER	FLOOD CONTROL	REGIONAL PARKS/REC	FIRE STATION	TOTAL

6. Residential construction tax for neighborhood parks revenue is estimated at the lesser of 1% of building permit valuation or $1,000 per residential unit. Given an estimated Added Improvements Value shown in Appendix 1, 1% of building per valuation will result in the following values per unit:

Village 1	$ 2,093
Village 2	$ 2,093
Village 3	$ 2,793
Village 4	$ 2,793
Village 5	$ 3,150
Village 6	$ 3,493
Village 7	$ 4,025

The alternative of $1,000 per unit is the lesser of the two options and is used in this calculation of residential tax revenue. Source: Sparks Municipal Code 15.12.0040.

7. The Project is located adjacent to the Impact Fees Service Area Number 1. Should the rpoject be added to the Area, the following fees will apply to the project:

	Unit of Measure	Sanitary Sewer	Flood Control	Regional Parks/Rec	Fire Station
Single Family	Dwelling	$ 297.00	$ 593.00	$ 778.00	$ 340.00
Commercial	1,000 Sq.Ft.	$ 279.00	$ 537.00	$ -	$ 340.00

Source: "City of Sparks Permit Fees." Revised October 9, 2017.

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

	Base Year FY 16-17	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	1ST 10-YEAR SUBTOTAL
GENERAL FUND												
REVENUE												
Taxes												
Ad Valorem[1]	Appendix 3	$ 54,831	$ 105,697	$ 424,722	$ 742,322	$ 1,076,375	$ 1,386,658	$ 1,701,005	$ 1,752,035	$ 1,804,597	$ 1,858,734	**$ 10,906,978**
Subtotal		**$ 54,831**	**$ 105,697**	**$ 424,722**	**$ 742,322**	**$ 1,076,375**	**$ 1,386,658**	**$ 1,701,005**	**$ 1,752,035**	**$ 1,804,597**	**$ 1,858,734**	**$ 10,906,978**
Licenses and Permits												
Business Licenses[3]	$ 5,878,303	$ -	$ -	$ 45,831	$ 94,031	$ 142,337	$ 198,304	$ 254,380	$ 262,011	$ 269,872	$ 277,968	**$ 1,544,734**
Liquor Licenses[3]	252,674	-	-	1,970	4,042	6,118	8,524	10,934	11,262	11,600	11,948	**66,399**
City Gaming Licenses[2]	554,193	-	-	-	-	-	-	-	-	-	-	**-**
Franchise Fees[3]	4,416,852	-	-	34,437	70,653	106,950	149,002	191,137	196,871	202,777	208,860	**1,160,685**
Nonbusiness Licenses and Permits[5]	53,249	-	-	415	852	1,289	1,796	2,304	2,373	2,445	2,518	**13,993**
Subtotal	**$ 11,155,271**	**$ -**	**$ -**	**$ 82,653**	**$ 169,578**	**$ 256,695**	**$ 357,626**	**$ 458,755**	**$ 472,518**	**$ 486,693**	**$ 501,294**	**$ 2,785,811**
Intergovernmental Revenue												
Consolidated Tax-CCRT Revenue[4]	Appendix 4	$ -	$ 101,796	$ 108,970	$ 126,043	$ 150,708	$ 166,776	$ 79,307	$ 81,686	$ 84,137	$ 86,661	**$ 986,084**
Consolidated Tax-Other Revenue[5]	$ 3,643,715	-	-	28,409	58,286	88,229	122,920	157,679	162,410	167,282	172,301	**957,516**
State Distributive Fund-Sales Tax[4]	Appendix 4	-	6,987	7,479	8,651	10,344	11,447	5,443	5,607	5,775	5,948	**67,680**
State Distributive Fund-Other[6]	Appendix 3	116	224	902	1,576	2,285	2,943	3,611	3,719	3,831	3,946	**23,152**
County Gaming Licenses[2]	389,292	-	-	-	-	-	-	-	-	-	-	**-**
Other Intergovernmental Revenue[7]	551,354	-	-	-	-	-	-	-	-	-	-	**-**
Subtotal		**$ 116**	**$ 109,007**	**$ 145,759**	**$ 194,556**	**$ 251,566**	**$ 304,087**	**$ 246,040**	**$ 253,422**	**$ 261,024**	**$ 268,855**	**$ 2,034,432**
Charges for Services												
Building and Zoning Fees[7]	$ 27,305	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Other[8]	2,646,746	-	-	-	-	-	-	-	-	-	-	**-**
Subtotal	**$ 2,674,051**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Fines and Forfeits												
Fines[3]	$ 619,500	$ -	$ -	$ 4,830	$ 9,910	$ 15,001	$ 20,899	$ 26,808	$ 27,613	$ 28,441	$ 29,294	**$ 162,796**
Miscellaneous												
Miscellaneous[7]	$ 153,669	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
REVENUE TOTAL		**$ 54,948**	**$ 214,704**	**$ 657,964**	**$ 1,116,366**	**$ 1,599,636**	**$ 2,069,269**	**$ 2,432,609**	**$ 2,505,588**	**$ 2,580,755**	**$ 2,658,178**	**$ 15,890,017**

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

EXPENDITURES	Base Year FY 16-17	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	1ST 10-YEAR SUBTOTAL
General Government												
Legislative[9]	$ 438,791	$ -	$ 919	$ 3,320	$ 5,410	$ 7,573	$ 9,999	$ 11,996	$ 12,345	$ 12,705	$ 13,076	**$ 77,344**
Mayor[9]	109,556	-	230	829	1,351	1,891	2,496	2,995	3,082	3,172	3,265	**19,311**
Management Services[9]	5,966,619	-	12,501	45,145	73,570	102,982	135,962	163,113	167,868	172,765	177,808	**1,051,714**
Legal[9]	1,617,935	-	3,390	12,242	19,950	27,925	36,868	44,231	45,520	46,848	48,215	**285,187**
Financial Services[9]	3,044,757	-	6,379	23,037	37,543	52,552	69,381	83,237	85,663	88,162	90,735	**536,688**
Community Services[9]	1,032,879	-	2,164	7,815	12,736	17,827	23,536	28,237	29,060	29,907	30,780	**182,062**
General Government Total	**$ 12,210,537**	**$ -**	**$ 25,582**	**$ 92,387**	**$ 150,559**	**$ 210,751**	**$ 278,244**	**$ 333,808**	**$ 343,537**	**$ 353,559**	**$ 363,881**	**$ 2,152,307**
Judicial												
Judicial[10]	$ 2,123,457	$ -	$ -	$ 16,556	$ 33,967	$ 51,417	$ 71,634	$ 91,891	$ 94,648	$ 97,487	$ 100,412	**$ 558,014**
Judicial Total		**$ -**	**$ -**	**$ 16,556**	**$ 33,967**	**$ 51,417**	**$ 71,634**	**$ 91,891**	**$ 94,648**	**$ 97,487**	**$ 100,412**	**$ 558,014**
Public Safety												
Police												
Police[11]	Appendix 7	$ -	$ 4,825	$ 179,654	$ 320,617	$ 461,896	$ 625,547	$ 789,526	$ 812,079	$ 835,308	$ 859,234	**$ 4,888,686**
Fire												
Fire[12]	Appendix 8	$ -	$ 49,622	$ 100,199	$ 148,226	$ 203,841	$ 259,571	$ 267,359	$ 275,379	$ 283,641	$ 292,150	**$ 1,879,988**
Community Services												
Community Services[13]	$ 1,277,098	$ -	$ 21,931	$ 22,589	$ 23,267	$ 23,965	$ 24,683	$ 25,424	$ 26,187	$ 26,972	$ 27,781	**$ 222,799**
Public Safety Total		**$ -**	**$ 76,378**	**$ 302,442**	**$ 492,109**	**$ 689,701**	**$ 909,802**	**$ 1,082,309**	**$ 1,113,645**	**$ 1,145,921**	**$ 1,179,165**	**$ 6,991,473**
Public Works												
Community Services[14]	$ 1,480,919	$ -	$ 25,431	$ 26,194	$ 26,980	$ 27,789	$ 28,623	$ 29,482	$ 30,366	$ 31,277	$ 32,215	**$ 258,357**
Public Works Total		**$ -**	**$ 25,431**	**$ 26,194**	**$ 26,980**	**$ 27,789**	**$ 28,623**	**$ 29,482**	**$ 30,366**	**$ 31,277**	**$ 32,215**	**$ 258,357**
Culture and Recreation												
Community Services[10]	$ 2,883,027	$ -	$ -	$ 22,478	$ 46,118	$ 69,810	$ 97,258	$ 124,761	$ 128,504	$ 132,359	$ 136,330	**$ 757,618**
Culture and Recreation Total		**$ -**	**$ -**	**$ 22,478**	**$ 46,118**	**$ 69,810**	**$ 97,258**	**$ 124,761**	**$ 128,504**	**$ 132,359**	**$ 136,330**	**$ 757,618**

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

	Base Year FY 16-17	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	1ST 10-YEAR SUBTOTAL
Community Support												
Management Services[9]	$ 268,707	$ -	$ 563	$ 2,033	$ 3,313	$ 4,638	$ 6,123	$ 7,346	$ 7,560	$ 7,780	$ 8,008	**$ 47,364**
Community Support Total		**$ -**	**$ 563**	**$ 2,033**	**$ 3,313**	**$ 4,638**	**$ 6,123**	**$ 7,346**	**$ 7,560**	**$ 7,780**	**$ 8,008**	**$ 47,364**
EXPENDITURES SUBTOTAL		**$ -**	**$ 127,954**	**$ 462,090**	**$ 753,046**	**$ 1,054,106**	**$ 1,391,685**	**$ 1,669,597**	**$ 1,718,260**	**$ 1,768,384**	**$ 1,820,011**	**$ 10,765,132**
CONTINGENCY	**3%**	**$ -**	**$ 3,839**	**$ 13,863**	**$ 22,591**	**$ 31,623**	**$ 41,751**	**$ 50,088**	**$ 51,548**	**$ 53,052**	**$ 54,600**	**$ 322,954**
EXPENDITURES TOTAL		**$ -**	**$ 131,793**	**$ 475,953**	**$ 775,638**	**$ 1,085,729**	**$ 1,433,435**	**$ 1,719,684**	**$ 1,769,808**	**$ 1,821,435**	**$ 1,874,611**	**$ 11,088,086**
GENERAL FUND SURPLUS/(DEFICIT)		**$ 54,948**	**$ 82,911**	**$ 182,011**	**$ 340,728**	**$ 513,907**	**$ 635,834**	**$ 712,925**	**$ 735,780**	**$ 759,320**	**$ 783,567**	**$ 4,801,931**
ROAD FUND												
REVENUE												
Licenses and Permits												
Licenses and Permits[3,15]	$ 1,609,563	$ -	$ -	$ 12,549	$ 25,747	$ 38,974	$ 54,298	$ 69,653	$ 71,742	$ 73,895	$ 76,112	**$ 422,970**
Subtotal		**$ -**	**$ -**	**$ 12,549**	**$ 25,747**	**$ 38,974**	**$ 54,298**	**$ 69,653**	**$ 71,742**	**$ 73,895**	**$ 76,112**	**$ 422,970**
Intergovernmental Revenues												
County Gasoline Tax[3]	$ 665,250	$ -	$ -	$ 5,187	$ 10,642	$ 16,108	$ 22,442	$ 28,788	$ 29,652	$ 30,541	$ 31,458	**$ 174,818**
State Gasoline Tax[3]	1,793,365	-	-	13,982	28,687	43,425	60,499	77,607	79,935	82,333	84,803	**471,271**
Subtotal	**2,458,615**	**$ -**	**$ -**	**$ 19,169**	**$ 39,329**	**$ 59,533**	**$ 82,941**	**$ 106,395**	**$ 109,587**	**$ 112,875**	**$ 116,261**	**$ 646,089**
Miscellaneous												
Interest Earned[7]	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Subtotal		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
REVENUE TOTAL		**$ -**	**$ -**	**$ 31,718**	**$ 65,076**	**$ 98,507**	**$ 137,239**	**$ 176,048**	**$ 181,329**	**$ 186,769**	**$ 192,372**	**$ 1,069,059**
EXPENDITURES												
Public Works[16]	Appendix 9	$ -	$ 784	$ 888,285	$ 888,737	$ 890,382	$ 892,614	$ 894,255	$ 894,428	$ 894,604	$ 894,783	**$ 7,138,871**
EXPENDITURES SUBTOTAL		**$ -**	**$ 784**	**$ 888,285**	**$ 888,737**	**$ 890,382**	**$ 892,614**	**$ 894,255**	**$ 894,428**	**$ 894,604**	**$ 894,783**	**$ 7,138,871**
CONTINGENCY	**0%**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
EXPENDITURES TOTAL		**$ -**	**$ 784**	**$ 888,285**	**$ 888,737**	**$ 890,382**	**$ 892,614**	**$ 894,255**	**$ 894,428**	**$ 894,604**	**$ 894,783**	**$ 7,138,871**
ROAD FUND SURPLUS/(DEFICIT)		**$ -**	**$ (784)**	**$ (856,567)**	**$ (823,661)**	**$ (791,875)**	**$ (755,375)**	**$ (718,207)**	**$ (713,098)**	**$ (707,834)**	**$ (702,411)**	**$ (6,069,812)**

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	10-YEAR SUBTOTAL	20-YEAR TOTAL
GENERAL FUND												
REVENUE												
Taxes												
Ad Valorem[1]	$1,914,496	$ 1,971,931	$2,031,089	$ 2,092,022	$ 2,154,783	$2,219,426	$ 2,286,009	$2,354,589	$ 2,425,227	$ 2,497,984	**$21,947,557**	**$ 32,854,535**
Subtotal	**$1,914,496**	**$ 1,971,931**	**$2,031,089**	**$ 2,092,022**	**$ 2,154,783**	**$2,219,426**	**$ 2,286,009**	**$2,354,589**	**$ 2,425,227**	**$ 2,497,984**	**$21,947,557**	**$ 32,854,535**
Licenses and Permits												
Business Licenses[3]	$ 286,307	$ 294,896	$ 303,743	$ 312,855	$ 322,241	$ 331,908	$ 341,865	$ 352,121	$ 362,685	$ 373,565	**$ 3,282,187**	**$ 4,826,921**
Liquor Licenses[3]	12,307	12,676	13,056	13,448	13,851	14,267	14,695	15,136	15,590	16,057	**141,082**	**207,481**
City Gaming Licenses[2]	-	-	-	-	-	-	-	-	-	-	-	-
Franchise Fees[3]	215,126	221,580	228,227	235,074	242,126	249,390	256,872	264,578	272,515	280,690	**2,466,177**	**3,626,862**
Nonbusiness Licenses and Permits[3]	2,594	2,671	2,751	2,834	2,919	3,007	3,097	3,190	3,285	3,384	**29,732**	**43,725**
Subtotal	**$ 516,333**	**$ 531,823**	**$ 547,778**	**$ 564,211**	**$ 581,137**	**$ 598,571**	**$ 616,528**	**$ 635,024**	**$ 654,075**	**$ 673,697**	**$ 5,919,178**	**$ 8,704,989**
Intergovernmental Revenue												
Consolidated Tax-CCRT Revenue[4]	$ 89,261	$ 91,939	$ 94,697	$ 97,538	$ 100,464	$ 103,478	$ 106,582	$ 109,779	$ 113,073	$ 116,465	**$ 1,023,275**	**$ 2,009,359**
Consolidated Tax-Other Revenue[5]	177,470	182,794	188,278	193,926	199,744	205,736	211,908	218,265	224,813	231,558	**2,034,491**	**2,992,007**
State Distributive Fund-Sales Tax[4]	6,126	6,310	6,499	6,694	6,895	7,102	7,315	7,535	7,761	7,994	**70,232**	**137,912**
State Distributive Fund-Other[6]	4,064	4,186	4,311	4,441	4,574	4,711	4,853	4,998	5,148	5,302	**46,588**	**69,741**
County Gaming Licenses[2]	-	-	-	-	-	-	-	-	-	-	-	-
Other Intergovernmental Revenue[7]	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ 276,921**	**$ 285,228**	**$ 293,785**	**$ 302,599**	**$ 311,677**	**$ 321,027**	**$ 330,658**	**$ 340,578**	**$ 350,795**	**$ 361,319**	**$ 3,174,586**	**$ 5,209,018**
Charges for Services												
Building and Zoning Fees[7]	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**	**$ -**
Other[8]	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Fines and Forfeits												
Fines[3]	$ 30,173	$ 31,078	$ 32,011	$ 32,971	$ 33,960	$ 34,979	$ 36,028	$ 37,109	$ 38,222	$ 39,369	**$ 345,902**	**$ 508,697**
Miscellaneous												
Miscellaneous[7]	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**	**$ -**
REVENUE TOTAL	**$2,737,923**	**$ 2,820,061**	**$2,904,663**	**$ 2,991,803**	**$ 3,081,557**	**$3,174,003**	**$ 3,269,224**	**$3,367,300**	**$ 3,468,319**	**$ 3,572,369**	**$31,387,222**	**$ 47,277,239**

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

EXPENDITURES	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	10-YEAR SUBTOTAL	20-YEAR TOTAL
General Government												
Legislative[9]	$ 13,458	$ 13,852	$ 14,257	$ 14,675	$ 15,105	$ 15,547	$ 16,004	$ 16,474	$ 16,958	$ 17,456	**$ 153,785**	**$ 231,129**
Mayor[9]	3,360	3,458	3,560	3,664	3,771	3,882	3,996	4,113	4,234	4,358	**38,396**	**57,707**
Management Services[9]	183,004	188,354	193,866	199,543	205,390	211,413	217,616	224,005	230,586	237,365	**2,091,141**	**3,142,855**
Legal[9]	49,624	51,075	52,570	54,109	55,694	57,328	59,010	60,742	62,527	64,365	**567,043**	**852,231**
Financial Services[9]	93,386	96,117	98,930	101,826	104,810	107,883	111,049	114,309	117,668	121,127	**1,067,106**	**1,603,794**
Community Services[9]	31,680	32,606	33,560	34,543	35,555	36,598	37,671	38,777	39,917	41,090	**361,997**	**544,058**
General Government Total	**$ 374,512**	**$ 385,463**	**$ 396,742**	**$ 408,359**	**$ 420,325**	**$ 432,650**	**$ 445,345**	**$ 458,421**	**$ 471,889**	**$ 485,761**	**$ 4,279,467**	**$ 6,431,774**
Judicial												
Judicial[10]	$ 103,424	$ 106,527	$ 109,723	$ 113,015	$ 116,405	$ 119,897	$ 123,494	$ 127,199	$ 131,015	$ 134,945	**$ 1,185,645**	**$ 1,743,659**
Judicial Total	**$ 103,424**	**$ 106,527**	**$ 109,723**	**$ 113,015**	**$ 116,405**	**$ 119,897**	**$ 123,494**	**$ 127,199**	**$ 131,015**	**$ 134,945**	**$ 1,185,645**	**$ 1,743,659**
Public Safety												
Police												
Police[11]	$ 883,878	$ 909,261	$ 935,406	$ 962,334	$ 990,071	$1,018,640	$ 1,048,066	$1,078,375	$ 1,109,593	$ 1,141,747	**$10,077,372**	**$ 14,966,058**
Fire												
Fire[12]	$ 300,914	$ 309,942	$ 319,240	$ 328,817	$ 338,682	$ 348,842	$ 359,308	$ 370,087	$ 381,189	$ 392,625	**$ 3,449,647**	**$ 5,329,635**
Community Services												
Community Services[13]	$ 28,615	$ 29,473	$ 30,358	$ 31,268	$ 32,206	$ 33,173	$ 34,168	$ 35,193	$ 36,249	$ 37,336	**$ 328,038**	**$ 550,837**
Public Safety Total	**$1,213,407**	**$ 1,248,676**	**$1,285,003**	**$ 1,322,420**	**$ 1,360,959**	**$1,400,655**	**$ 1,441,541**	**$1,483,654**	**$ 1,527,031**	**$ 1,571,709**	**$13,855,057**	**$ 20,846,529**
Public Works												
Community Services[14]	$ 33,182	$ 34,177	$ 35,203	$ 36,259	$ 37,346	$ 38,467	$ 39,621	$ 40,809	$ 42,034	$ 43,295	**$ 380,392**	**$ 638,749**
Public Works Total	**$ 33,182**	**$ 34,177**	**$ 35,203**	**$ 36,259**	**$ 37,346**	**$ 38,467**	**$ 39,621**	**$ 40,809**	**$ 42,034**	**$ 43,295**	**$ 380,392**	**$ 638,749**
Culture and Recreation												
Community Services[10]	$ 140,420	$ 144,632	$ 148,971	$ 153,441	$ 158,044	$ 162,785	$ 167,669	$ 172,699	$ 177,880	$ 183,216	**$ 1,609,756**	**$ 2,367,374**
Culture and Recreation Total	**$ 140,420**	**$ 144,632**	**$ 148,971**	**$ 153,441**	**$ 158,044**	**$ 162,785**	**$ 167,669**	**$ 172,699**	**$ 177,880**	**$ 183,216**	**$ 1,609,756**	**$ 2,367,374**

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	10-YEAR SUBTOTAL	20-YEAR TOTAL
Community Support												
Management Services[9]	$ 8,242	$ 8,483	$ 8,731	$ 8,986	$ 9,250	$ 9,521	$ 9,800	$ 10,088	$ 10,384	$ 10,690	**$ 94,175**	**$ 141,539**
Community Support Total	**$ 8,242**	**$ 8,483**	**$ 8,731**	**$ 8,986**	**$ 9,250**	**$ 9,521**	**$ 9,800**	**$ 10,088**	**$ 10,384**	**$ 10,690**	**$ 94,175**	**$ 141,539**
EXPENDITURES SUBTOTAL	**$1,873,187**	**$ 1,927,958**	**$1,984,373**	**$ 2,042,480**	**$ 2,102,330**	**$2,163,976**	**$ 2,227,471**	**$2,292,870**	**$ 2,360,232**	**$ 2,429,615**	**$21,404,492**	**$ 32,169,625**
CONTINGENCY	**$ 56,196**	**$ 57,839**	**$ 59,531**	**$ 61,274**	**$ 63,070**	**$ 64,919**	**$ 66,824**	**$ 68,786**	**$ 70,807**	**$ 72,888**	**$ 642,135**	**$ 965,089**
EXPENDITURES TOTAL	**$1,929,383**	**$ 1,985,797**	**$2,043,904**	**$ 2,103,754**	**$ 2,165,400**	**$2,228,895**	**$ 2,294,295**	**$2,361,657**	**$ 2,431,039**	**$ 2,502,503**	**$22,046,627**	**$ 33,134,713**
GENERAL FUND SURPLUS/(DEFICIT	**$ 808,541**	**$ 834,264**	**$ 860,759**	**$ 888,048**	**$ 916,157**	**$ 945,109**	**$ 974,929**	**$1,005,644**	**$ 1,037,280**	**$ 1,069,865**	**$ 9,340,595**	**$ 14,142,526**
ROAD FUND												
REVENUE												
Licenses and Permits												
Licenses and Permits[3,15]	$ 78,395	$ 80,747	$ 83,169	$ 85,664	$ 88,234	$ 90,881	$ 93,608	$ 96,416	$ 99,308	$ 102,288	**$ 898,710**	**$ 1,321,680**
Subtotal	**$ 78,395**	**$ 80,747**	**$ 83,169**	**$ 85,664**	**$ 88,234**	**$ 90,881**	**$ 93,608**	**$ 96,416**	**$ 99,308**	**$ 102,288**	**$ 898,710**	**$ 1,321,680**
Intergovernmental Revenues												
County Gasoline Tax[3]	$ 32,401	$ 33,374	$ 34,375	$ 35,406	$ 36,468	$ 37,562	$ 38,689	$ 39,850	$ 41,045	$ 42,277	**$ 371,446**	**$ 546,265**
State Gasoline Tax[3]	87,347	89,968	92,667	95,447	98,310	101,259	104,297	107,426	110,649	113,968	**1,001,337**	**1,472,607**
Subtotal	**$ 119,749**	**$ 123,341**	**$ 127,041**	**$ 130,852**	**$ 134,778**	**$ 138,821**	**$ 142,986**	**$ 147,276**	**$ 151,694**	**$ 156,245**	**$ 1,372,783**	**$ 2,018,872**
Miscellaneous												
Interest Earned[7]	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**	**$ -**
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
REVENUE TOTAL	**$ 198,143**	**$ 204,088**	**$ 210,210**	**$ 216,517**	**$ 223,012**	**$ 229,703**	**$ 236,594**	**$ 243,691**	**$ 251,002**	**$ 258,532**	**$ 2,271,493**	**$ 3,340,551**
EXPENDITURES												
Public Works[16]	$ 894,967	$ 895,154	$ 895,344	$ 895,539	$ 895,737	$ 895,939	$ 896,146	$ 896,356	$ 896,571	$ 896,790	**$ 8,958,543**	**$ 16,097,414**
EXPENDITURES SUBTOTAL	**$ 894,967**	**$ 895,154**	**$ 895,344**	**$ 895,539**	**$ 895,737**	**$ 895,939**	**$ 896,146**	**$ 896,356**	**$ 896,571**	**$ 896,790**	**$ 8,958,543**	**$ 16,097,414**
CONTINGENCY	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
EXPENDITURES TOTAL	**$ 894,967**	**$ 895,154**	**$ 895,344**	**$ 895,539**	**$ 895,737**	**$ 895,939**	**$ 896,146**	**$ 896,356**	**$ 896,571**	**$ 896,790**	**$ 8,958,543**	**$ 16,097,414**
ROAD FUND SURPLUS/(DEFICIT)	**$ (696,823)**	**$ (691,065)**	**$ (685,133)**	**$ (679,022)**	**$ (672,724)**	**$ (666,236)**	**$ (659,552)**	**$ (652,664)**	**$ (645,568)**	**$ (638,258)**	**$ (6,687,050)**	**$ (12,756,862)**

APPENDIX 6
CITY OF SPARKS
COMPARISON OF ESTIMATED REVENUE TO ESTIMATED COSTS

APPENDIX 6, ASSUMPTIONS:

Unless otherwise indicated, the analysis uses Estimated Current Year Ending 6/30/2017 (Fiscal Year 2016-2017) revenue and expenditure data from the City of Sparks Budget, FY 2017-18.

1 See Appendix 3 for calculations.

2 The analysis is conservative in not estimating the increase in some Sparks business-related revenues resulting from new residents of the development, though this increase is expected to occur.

3 ACM: Revenues are calculated based on estimated FY 2016-17 City of Sparks estimated per capita revenues inflated **3%** annually and applied to the estimated annual population of the Project. Per capita revenue is calculated by dividing FY 2016-17 revenue for each source by City of Sparks FY 2016-17 population of **93,581** Source: City of Sparks Budget FY 2017-18.

4 See Appendix 4 for calculations.

5 In addition to CCRT revenue, Consolidated tax for the City includes revenue from Real Property Transfer Tax, GST (MVPT), Cigarette and Liquor taxes. A per capita methodology as explained in footnote 3 is applied to estimate this revenue. Total Washoe County revenues from liquor, cigarette and GST (analysis conservatively does not include RPTT as it is not a recurring revenue) sources totaled **$ 30,048,968** in FY 2016-2017. City of Sparks is estimated to receive **12.13%** of all County C-tax revenue. As a result, the City's portion of GST revenue is estimated at **$ 3,643,715** and the ACM is applied to this amount.
Source: Nevada Department of Taxation. "Consolidated Tax Distribution." City of Sparks portion of C-tax revenue is based on a three-year average data for FY 2014-15 to FY 2016-17.

6 In addition to sales tax revenue, AB 104 revenue for the City includes revenue from property, gaming, and RPTT taxes and interest. Analysis is conservative in not estimating gaming, RPTT, and interest revenue. Property tax revenue is estimated in Appendix 3.

7 Though the project may generate revenue for the City from these sources, the amount is difficult to estimate and/or expected to be minimal.

8 Charges for services for the City include inter-department and inter-fund transfers, which, though impacted, may be difficult to estimate. Some charges for services revenue, such as false alarms may be generated by the project, but again are difficult to estimate.

9 Administrative service (indirect) costs assumed to be impacted by the project are calculated at **25.7%** of direct service costs.
Source: Average percent indirect costs of direct costs for FY 2016-17. Source: City of Sparks Budget, FY 2017-18.

10 ACM: Expenditures are calculated based on estimated FY 2016-17 City of Sparks budget per capita costs inflated **3%** annually and applied to estimated annual population of the Project. Per capita costs are calculated by dividing FY 2016-17 costs for each source by City of Sparks FY 2016-17 population of **93,581** Source: City of Sparks Budget FY 2017-18.

11 See Appendix 7 for calculations and assumptions.

12 See Appendix 8 for calculations and assumptions.

13 Expenditures for the Public Safety source include traffic signals, signs and other public safety items. Costs associated with these services are estimated by dividing total expenditures for this source of **$ 1,277,098** by the total square feet of City of Sparks streets of **67,541,767** and applying to the number of square feet added by the development of **1,093,280** inflated 3% annually. Source: Expenditures from City of Sparks budget FY 2017-18, City of Sparks streets inventory from City of Sparks Community Services Department.

14 Expenditures for the Public Works source include Public Works administrative and facility maintenance costs. Costs associated with these services are estimated by dividing total expenditures for this source of **$ 1,480,919** by the total square feet of City of Sparks streets of **67,541,767** and applying to the number of square feet added by the development of **1,093,280** inflated 3% annually. Source: Expenditures from City of Sparks budget FY 2017-18, City of Sparks streets inventory from City of Sparks Community Services Department.

15 Analysis uses FY 2017-18 amount (instead of FY 2016-17) as it includes the shift of franchise revenues from the Road Fund to the Park & Recreation Project Fund.

16 See Appendix 9 for calculation and assumptions.

APPENDIX 7
CITY OF SPARKS
POLICE DEPARTMENT COST PROJECTIONS

YEAR	CUMUL. NEW RESIDENTIAL POPULATION	OFFICERS REQUIRED RESIDENTIAL	OFFICERS REQUIRED COMMERCIAL	OFFICERS REQUIRED TOTAL	CIVILIANS REQUIRED	SALARY/ BENEFITS	SERVICES/ SUPPLIES	ANNUALIZED VEHICLE COSTS	TOTAL COST
2018	-	-	-	-	-	$ -	$ -	$ -	$ -
2019	-	-	0.04	0.04	0.01	4,662	163	-	4,825
2020	668	1.00	0.06	1.06	0.35	137,076	4,804	37,775	179,654
2021	1,330	2.00	0.06	2.06	0.69	273,265	9,577	37,775	320,617
2022	1,955	2.93	0.06	2.99	1.00	409,761	14,360	37,775	461,896
2023	2,644	3.97	0.06	4.03	1.34	567,871	19,901	37,775	625,547
2024	3,293	4.94	0.06	5.00	1.67	726,298	25,454	37,775	789,526
2025	3,293	4.94	0.06	5.00	1.67	748,087	26,217	37,775	812,079
2026	3,293	4.94	0.06	5.00	1.67	770,530	27,004	37,775	835,308
2027	3,293	4.94	0.06	5.00	1.67	793,646	27,814	37,775	859,234
2028	3,293	4.94	0.06	5.00	1.67	817,455	28,648	37,775	883,878
2029	3,293	4.94	0.06	5.00	1.67	841,979	29,508	37,775	909,261
2030	3,293	4.94	0.06	5.00	1.67	867,238	30,393	37,775	935,406
2031	3,293	4.94	0.06	5.00	1.67	893,255	31,305	37,775	962,334
2032	3,293	4.94	0.06	5.00	1.67	920,053	32,244	37,775	990,071
2033	3,293	4.94	0.06	5.00	1.67	947,654	33,211	37,775	1,018,640
2034	3,293	4.94	0.06	5.00	1.67	976,084	34,208	37,775	1,048,066
2035	3,293	4.94	0.06	5.00	1.67	1,005,367	35,234	37,775	1,078,375
2036	3,293	4.94	0.06	5.00	1.67	1,035,528	36,291	37,775	1,109,593
2037	3,293	4.94	0.06	5.00	1.67	1,066,593	37,380	37,775	1,141,747
TOTAL						**$ 13,802,400**	**$ 483,715**	**$ 679,942**	**$ 14,966,058**

APPENDIX 7, ASSUMPTIONS:

1. Population estimates are shown in Appendix 2 of the report.
2. For the residential portion of the analysis, uniformed officer positions are estimated at **1.5** positions per 1,000 population.
   For non-uniformed positions, a ratio of **0.5** positions for every three uniformed positions, is used. Source: City of Sparks Police Department.
3. For General Commercial use, the analysis estimates the number of calls for service generated by the project by using average data for similar projects:

	Annual CFS	Building Sq.Ft.	CFS/Sq.Ft. (000s)	Project Sq.Ft.	Project CFS
Home Depot	52	102,489	0.51		
Costco	102	148,346	0.69		
Kohl's	92	87,888	1.05		
Average			**0.75**	**141,570**	**105.79**

Source: CFS from City of Sparks Police Department. Comparable project square footage from Washoe County Assessor.
However, many visitors to the commercial portion of the project will be existing residents of the project, calls for service for these residents are estimated above, or existing City of Sparks residents, already generating calls for service for the City. Only non-Sparks residents coming to the project will generate new calls for service for the City.
The analysis conservatively assumes 50% of the above General Commercial calls for service will be net new calls for service for the City.
According to a calculation of the number of calls for service handled annually by a police officer, based on the number of hours worked, break time, vacation time, and other components, an officer is estimated to handle an average of 875 calls for service per year. This results in an estimated **0.06** officer positions for the commercial portion of the project.
Source: City of Sparks Police Department and data from City of Reno Police Department for similar studies.

APPENDIX 7
CITY OF SPARKS
POLICE DEPARTMENT COST PROJECTIONS

4. The following City of Sparks salary information is used to estimate operating costs, inflated **3%** annually.

	Salary Range		
FY 2017-18	**Low**	**High**	**Average**
Police Officer	$ 51,730	$ 67,371	$ 59,550
Sergeant	73,112	87,734	80,423
Crime Analyst	55,245	70,512	62,878
Records Technician	45,510	57,990	51,750
Police Office Assistant	34,070	43,368	38,719
GT/IT Support Specialist	44,866	57,179	51,022
Dispatcher	43,368	55,245	49,306
Weighted Average Officers	**$ 54,402**	**$ 69,917**	**$ 62,160**
Weighted Average Civilians	**$ 40,351**	**$ 51,396**	**$ 45,873**

Source: "Online Jobs Page." City of Sparks Human Resources.

5. Benefits costs are calculated at **57.1%** of salaries.
   Services/Supplies costs calculated at **3.5%** of salaries and benefits.
   Source: Three-year average FY 2015-16 through FY 2017-18 from City of Sparks Budget FY 2017-18.
6. One police vehicle is added for every 3 uniformed positions. The 2017 cost of a fully-equipped vehicle is **$70,000** inflated 3% annually. Life of vehicle is 5 years and the analysis includes vehicle replacement costs with no salvage value. Source: City of Sparks Police Department.

APPENDIX 8
CITY OF SPARKS
FIRE DEPARTMENT COST PROJECTIONS

YEAR	CUMUL. # OF UNITS	RESIDENTIAL CFS*	COMMERCIAL CFS	TOTAL CFS*	ESTIMATED COST/CFS	TOTAL EXPENSES
2018	0	0.00	0.00	0.00	$ 1,473	$ -
2019	248	29.89	2.81	32.70	1,518	49,622
2020	494	59.54	4.56	64.10	1,563	100,199
2021	726	87.51	4.56	92.07	1,610	148,226
2022	982	118.36	4.56	122.92	1,658	203,841
2023	1,223	147.41	4.56	151.97	1,708	259,571
2024	1,223	147.41	4.56	151.97	1,759	267,359
2025	1,223	147.41	4.56	151.97	1,812	275,379
2026	1,223	147.41	4.56	151.97	1,866	283,641
2027	1,223	147.41	4.56	151.97	1,922	292,150
2028	1,223	147.41	4.56	151.97	1,980	300,914
2029	1,223	147.41	4.56	151.97	2,039	309,942
2030	1,223	147.41	4.56	151.97	2,101	319,240
2031	1,223	147.41	4.56	151.97	2,164	328,817
2032	1,223	147.41	4.56	151.97	2,229	338,682
2033	1,223	147.41	4.56	151.97	2,295	348,842
2034	1,223	147.41	4.56	151.97	2,364	359,308
2035	1,223	147.41	4.56	151.97	2,435	370,087
2036	1,223	147.41	4.56	151.97	2,508	381,189
2037	1,223	147.41	4.56	151.97	2,584	392,625
TOTAL						**$ 5,329,635**

*CFS-calls for service.

APPENDIX 8, ASSUMPTIONS:

1. Number of residential units from Appendix 1. Analysis includes all units, not just occupied units, for Fire Department impacts.
2. Residential calls for service are estimated using average cfs per unit data for single-family residential properties between FY 2011-12 and FY 2015-16, estimated at **0.12** cfs. Source: City of Sparks Fire Department and Washoe County Assessor's Office parcel data for number of single-family units.
3. Calls for service for the General Commercial portion are estimated using cfs data for comparable projects:

	Annual CFS	Building Sq.Ft.	CFS/Sq.Ft. (000s)	Project Sq.Ft.	Project CFS
Costco	10	148,346	0.07		
Kohl's	5.4	87,888	0.06		
Average			**0.06**	**141,570**	**9.12**

Source: City of Sparks Fire Department. Data is a five year average of calls for service for FY 2011-12 to FY 2015-16.
However, many visitors to the commercial portion of the project will be existing residents of the project, calls for service for these residents are estimated above, or existingCity of Sparks residents, already generating calls for service for the City. Only non-Sparks residents coming to the project will generate new calls for service for the City. The analysis conservatively assumes 50% of the above General Commercial calls for service will be net new calls for service for the City.

4. Costs to provide services to the development are estimated at **$ 1,430.44** per call for service. This is estimated using total fire expenditures between FY 2011-12 and FY 2015-16 divided by total calls for service during this period. This includes costs for Administration, Emergency Services, and Training and Safety. Estimated costs are inflated 3% annually.

APPENDIX 9
CITY OF SPARKS
STREET MAINTENANCE COST PROJECTIONS

			MAINTENANCE					REPAIR				
YEAR	ADDED SQUARE FEET	ADDED LINEAR FEET	SEWER CLEANING COST	CATCH BASIN COST	STREET SWEEP COST	STREET STRIPING COST	TOTAL COST	SLURRY/ CRACK SEAL COST	3 INCH OVERLAY COST	ROAD REHAB COST	TOTAL ANNUALIZED COST	TOTAL MAINT. COST
2018	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2019	358,780	10,470	-	-	784	-	784	-	-	-	-	784
2020	-	-	1,307	14	800	545	2,665	-	-	-	885,620	888,285
2021	174,080	5,120	1,333	14	1,214	556	3,117	-	-	-	885,620	888,737
2022	270,912	7,968	2,025	21	1,872	844	4,762	-	-	-	885,620	890,382
2023	289,508	7,782	3,121	33	2,540	1,300	6,994	-	-	-	885,620	892,614
2024	-	-	4,235	44	2,591	1,765	8,635	149,496	-	-	885,620	894,255
2025	-	-	4,320	45	2,643	1,800	8,808	-	-	-	885,620	894,428
2026	-	-	4,406	46	2,696	1,836	8,984	75,466	-	-	885,620	894,604
2027	-	-	4,495	47	2,749	1,873	9,164	119,793	-	-	885,620	894,783
2028	-	-	4,584	48	2,804	1,910	9,347	130,576	-	-	885,620	894,967
2029	-	-	4,676	49	2,861	1,948	9,534	-	1,782,607	-	885,620	895,154
2030	-	-	4,770	50	2,918	1,987	9,724	-	-	-	885,620	895,344
2031	-	-	4,865	51	2,976	2,027	9,919	-	899,863	-	885,620	895,539
2032	-	-	4,962	52	3,036	2,068	10,117	-	1,428,421	-	885,620	895,737
2033	-	-	5,062	53	3,096	2,109	10,320	-	1,557,000	-	885,620	895,939
2034	-	-	5,163	54	3,158	2,151	10,526	182,235	-	-	885,620	896,146
2035	-	-	5,266	55	3,221	2,194	10,737	-	-	-	885,620	896,356
2036	-	-	5,371	56	3,286	2,238	10,951	91,993	-	-	885,620	896,571
2037	-	-	5,479	57	3,352	2,283	11,170	146,027	-	11,148,918	885,620	896,790
TOTAL	**1,093,280**	**31,340**	**$ 75,441**	**$ 787**	**$ 48,597**	**$ 31,434**	**$ 156,258**	**$ 895,587**	**$ 5,667,891**	**$ 11,148,918**	**$ 15,941,156**	**$ 16,097,414**

APPENDIX 9, ASSUMPTIONS:

1. The development is projected to construct approximately **31,340** linear feet or **1,093,280** square feet of streets to be dedicated to the City for maintenance in the year shown above.

APPENDIX 9
CITY OF SPARKS
STREET MAINTENANCE COST PROJECTIONS

2. The following street maintenance costs are used to estimate the impact of the development's streets on the City:

Item	Frequency	Cost		
Slurry/Crack Seal	Year 5 and 15	$0.37	per square foot	
3 Inch Overlay	10 years	$4.00	per square foot	
Road Rehabilitation	20 years	$7.00	per square foot	
Sewer Cleaning	1.5 years	$0.18	per linear foot	Note: 2/3 of the cost is added annually
Catch Basin Cleaning	1.75 years	$11.56	per mile	Note: 3/5 of the cost is added annually
Street Sweeping	30 days	$32.30	per mile	Note: cost is multiplied by 12 annually
Striping	1 year	$0.05	per linear foot	

Costs are inflated 2% annually. Source: City of Sparks Community Services Department. Estimated repair (extraordinary maintenance) costs are annualized by taking the total estimated costs over the 20-year period and dividing by 20 years.

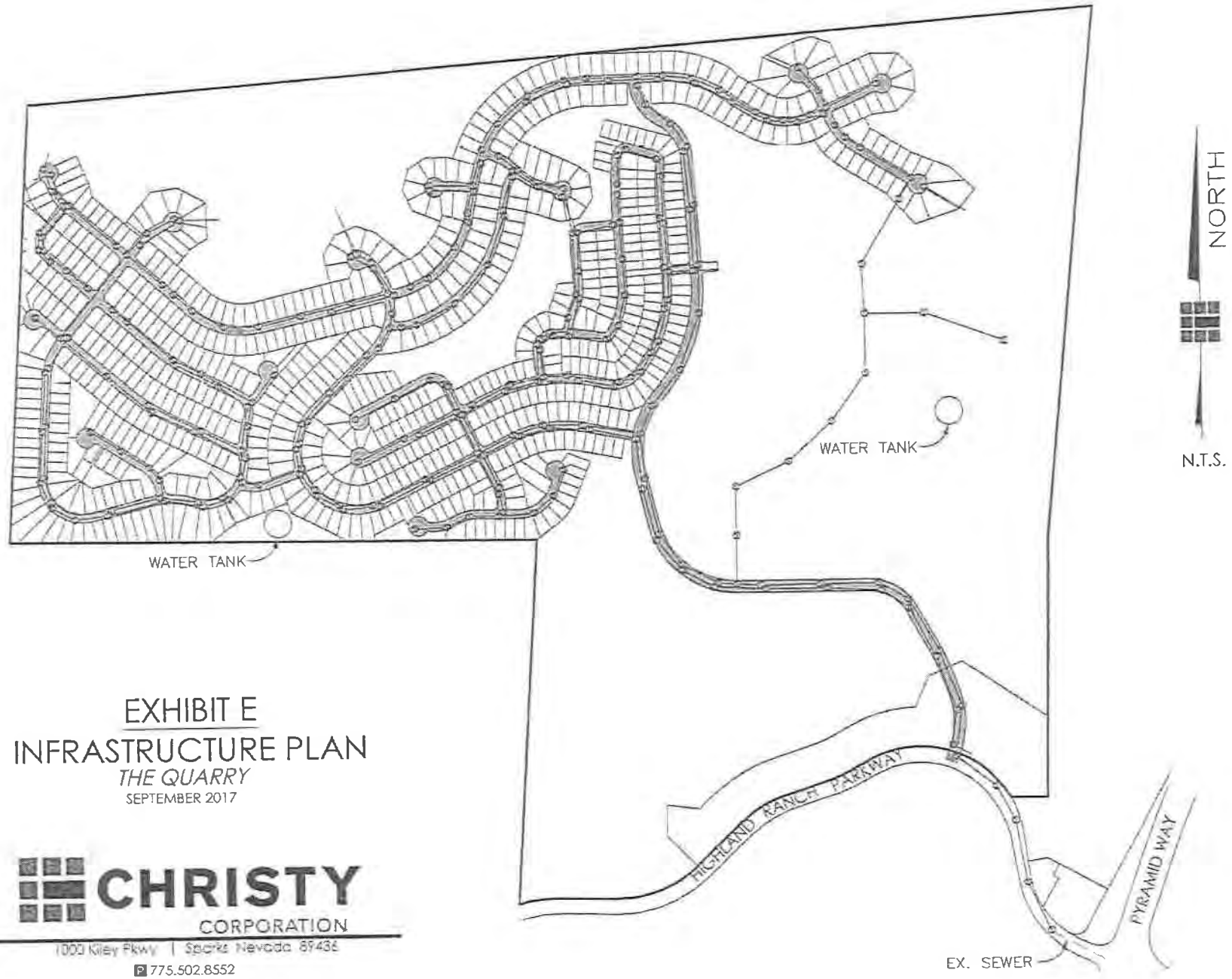


EXHIBIT E
INFRASTRUCTURE PLAN
THE QUARRY
SEPTEMBER 2017

CHRISTY
CORPORATION
1000 Kiley Pkwy | Sparks Nevada 89436
P 775.502.8552

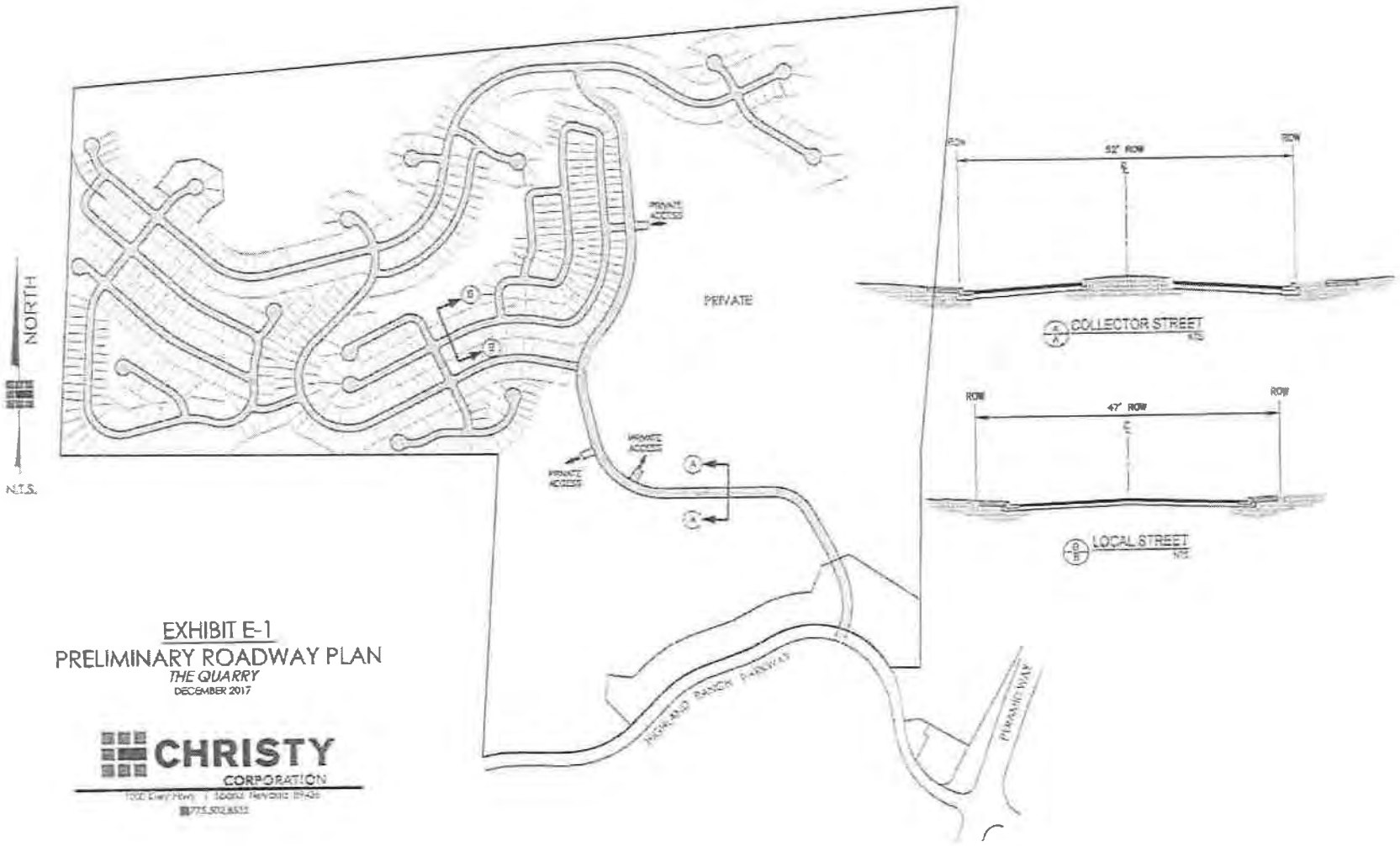


EXHIBIT E-1

PRELIMINARY ROADWAY PLAN

THE QUARRY

DECEMBER 2017

CHRISTY CORPORATION

1000 Kiley Pkwy | Sparks, Nevada 89436

775.972.8533

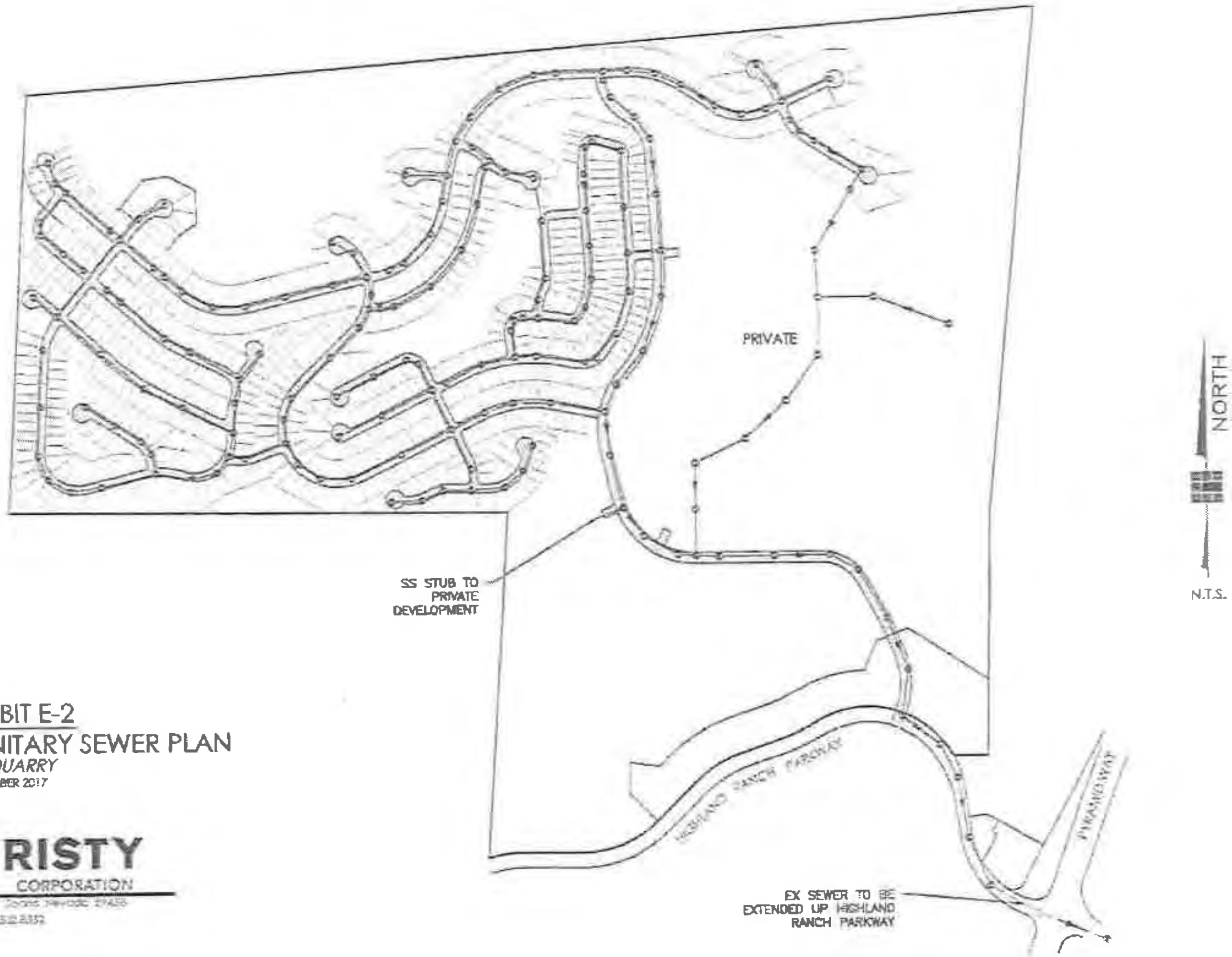


EXHIBIT E-2
PRELIMINARY SANITARY SEWER PLAN
THE QUARRY
DECEMBER 2017

CHRISTY
CORPORATION

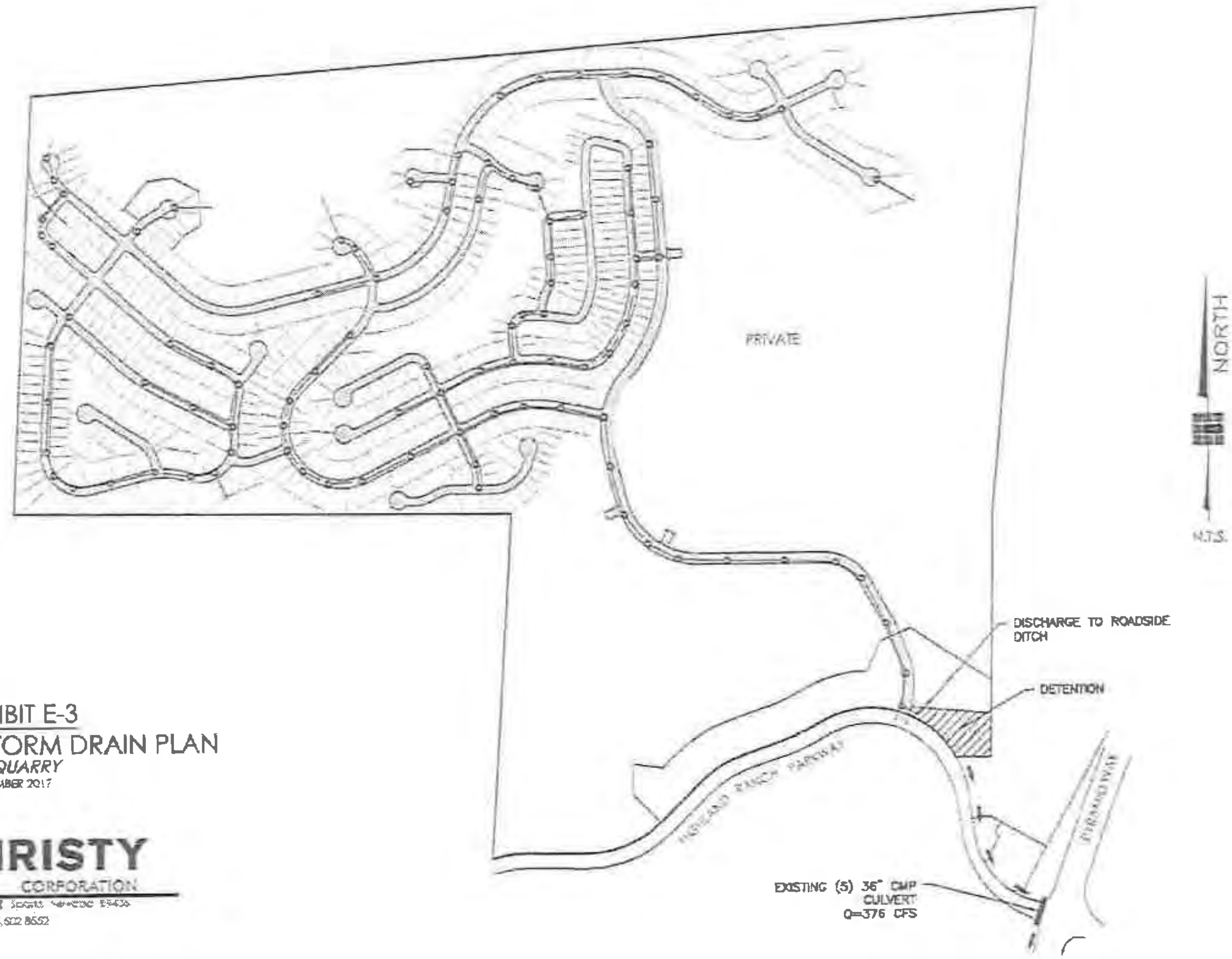
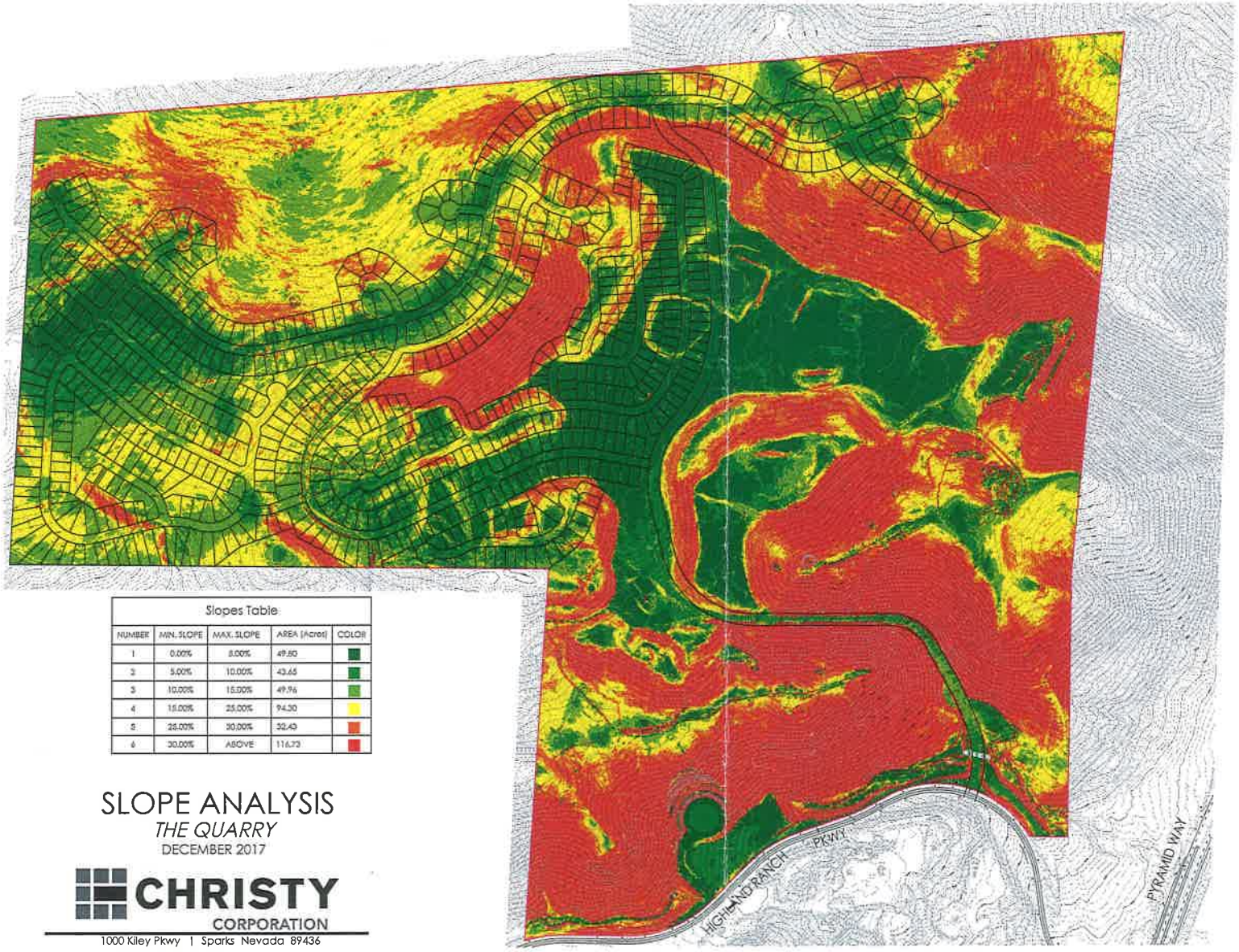


EXHIBIT E-3
PRELIMINARY STORM DRAIN PLAN
THE QUARRY
DECEMBER 2017

CHRISTY
CORPORATION



Slopes Table				
NUMBER	MIN. SLOPE	MAX. SLOPE	AREA (Acres)	COLOR
1	0.00%	5.00%	49.80	
2	5.00%	10.00%	43.65	
3	10.00%	15.00%	49.96	
4	15.00%	25.00%	94.30	
5	25.00%	30.00%	32.43	
6	30.00%	ABOVE	116.73	

SLOPE ANALYSIS

THE QUARRY

DECEMBER 2017

CHRISTY CORPORATION
1000 Kiley Pkwy | Sparks Nevada 89436
P 775.502.8552 christynv.com

NORTH

SCALE: 1"=500'

Jon E.

SOLAEGUI
ENGINEERS

March 12, 2018

RECEIVED-CITY OF SPARKS
MAR 12 2018
COMMUNITY SERVICES
ADMINISTRATION

Karen Melby, AICP
City of Sparks
Community Services Planning Division
431 Prater Way
Sparks, Nevada 89431

RE: The Quarry (NDOT Pre-Permit No. 207543-18)

Dear Karen:

This letter addendum is in response to comments submitted to you by the Nevada Department of Transportation in a letter dated February 22, 2018 regarding the above captioned traffic study. A copy of the letter is attached. The comments generally focus on 1) determining the dwelling unit threshold that would maintain LOS E operation at the Pyramid Highway/Sparks Boulevard/ Highland Ranch Parkway intersection without capacity improvements and 2) providing intersection capacity improvement recommendations necessary to maintain LOS E operation for buildout of the full 1,800 single family dwelling units proposed for the development.

In response to comment 1, a total of 650 dwelling units can be constructed while maintaining LOS E operation at the Pyramid Highway/Sparks Boulevard/Highland Ranch Parkway intersection. The AM and PM peak hour capacity analysis worksheets are attached.

In response to comment 2, the improvements discussed in the original traffic study will provide LOS E or better operation at the Pyramid Highway/Sparks Boulevard/Highland Ranch Parkway intersection with the construction of 1,800 dwelling units. These improvements include dual left turn lanes, two through lanes, and one free right turn lane at the east and west approaches and dual left turn lanes at the south approach. The AM and PM peak hour capacity analysis worksheets are attached.

We trust that this information will meet your requirements. Please call if you have any questions or comments.

Very truly yours,
SOLAEGUI ENGINEERS, LTD

Paul W. Solaegui

3-12-18
EXP 6-30-18

Enclosures
Letters/Sparks/The Quarry Addendum

Solaegui Engineers Ltd. • 715 H Street • Sparks, Nevada 89431 • 775/358-1004 • FAX 775/358-1098
Civil & Traffic Engineers
e-mail: psolaegui@aol.com

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

District II
310 Galletti Way
Sparks, Nevada 89431
(775) 834-8300 FAX (775) 834-8319

February 22, 2018

BRIAN SANDOVAL
Governor

RUDY MALFABON, P.E., *Director*

City of Sparks
Department of Planning/Comm. Devlop.
1675 E Prater Way #107
Sparks, NV 89434

DA18-0001/AX16-0003/
MPA17-00005/RZ17-0006
Jackling Aggregates, LLC/QK, LLC
The Quarry Development

Attention: Ms. Karen Melby, Planner

Dear Ms. Melby:

The Nevada Department of Transportation (NDOT), District II has reviewed the following administrative review requests:

(1) *DA17-0001 – A request for a Development Agreement between the City of Sparks and Jackling Aggregates, LLC and QK, LLC; and*

(2) *AX16-0003 – A request for voluntary annexation into the City of Sparks. Upon annexation the parcel shall convert from Washoe County Designation GR (General Rural) to City of Sparks A40 (Agriculture); and*

(3) *MPA 17-0005 – A request to change the land use designations from Open Space (OS), Commercial (C) and Employment Center (EC) to Intermediate Density Residential (1DR) and Commercial (C); and*

(4) *RZ17-0006 – A request to rezone the site from A40 (Agriculture) to SR 6 (Single Family Residential – 6,000 square feet lots) and C2 (General Commercial) zoning.*

The Quarry Development traffic impact study was provided by the applicant to support the proposed requests. The Quarry Development is proposed to be annexed into the City of Sparks. The project is located northwest of Highland Ranch Parkway and Pyramid Highway (State Route 445) intersection.

- The project is proposed to contain 1,223 single-family detached homes and a 13-acre mini storage facility. The Kiley Ranch land use assumptions consist of two convenience stores with gas pumps, three fast-food restaurants totaling 10,500 square feet, 30,000 square feet of retail buildings and two automotive service buildings totaling 16,000 square feet, a 4-bay car wash and 8 acres of additional mini-storage.

- The Quarry land use will generate approximately 10,974 daily trips, 900 a.m. and 1,046 p.m. peak hour trips. Based on the land use assumptions used in the study, the Kiley Ranch development will generate 15,936 daily trips, 1,003 a.m. and 1,092 p.m. peak hour trips.

- NDOT officially report Annual Average Daily Traffic (AADT) just north of Highland Ranch Parkway is 36,000 vehicles per day.
- The City's adopted level of service (LOS) standard for Pyramid Highway is a LOS E (arterial with moderate access control).
- NDOT reviewed the traffic impact study submitted on October 10, 2017. A technical review was completed on October 16, 2017 addressing concerns with the technical analyses and the project regional impacts.

NDOT District II has the following comments, specifically for the MPA 17-000- map amendment request:

1. The Quarry Development is classified as a project of regional significance as defined by NRS 278.026 5. (d)(6) and should be evaluated to determine if the project impacts any current programmed significant projects.
2. Based on the submitted traffic impact study, NDOT is requesting an addendum. The study revision should include proposed project phasing and its direct traffic impact to the level of service (LOS) at the intersection of Pyramid Highway and Highland Ranch Parkway.
   - On page 17 through 20 of the traffic study, the LOS for the intersection degrades from an existing LOS D to a LOS F (existing plus project). No traffic failure threshold is presented in the report.
   - The addendum should denote the threshold (number of units) that may trigger the LOS F condition to the intersection.
   - For the intersection, please provide recommendations for capacity improvement necessary to maintain LOS E.
3. The Quarry Development constitutes a new community development not previously account in the RTC Long Range Transportation Plan. The project should provide short term intersection improvements that will mitigate its traffic impact at the Pyramid Highway and Highland Ranch Parkway intersection.
   - NDOT does not have any capacity projects anticipated at this location in the near future. Additionally, the RTC Washoe Long Range Transportation Plan does not appear to have any programmed improvement for this intersection until the year 2027+.
   - The project should provide the necessary 10-year improvements that will maintain LOS E for the intersection.

Other comments specific to the future development/ permitting process:

4. An occupancy permit is required for facilities within the NDOT Right-of-Way. Please see the *Terms and Conditions Relating to Right of Way Occupancy Permits* booklet available online at nevadadot.com. Contact the Permit Office at (775) 834-8330 for more information regarding an occupancy permit.
5. The applicant is encouraged to coordinate with the NDOT District Permit Office early for any required standards occupancy permit. NDOT's permit processing time may vary based on project complexity; however, the processing time is approximately 45 working days. This does not include any revision time needed to make necessary changes in the design.

- An effective strategy to minimize delay is taking advantage of the District Permit Office's pre-permit process. Preliminary plans and associated engineering documents may be submitted in advance for NDOT review and comment. This service does not require a processing fee. Please contact the Permit Coordinator, Paula Diem, at (775) 834-8330 for any questions or comments regarding the pre-permit process.

6. For any non-permanent activities or temporary traffic control such as placement of cones, static signs, and portable electronic signs within NDOT right-of-way will require a temporary permit. Please submit temporary permit applications at least 4 weeks prior to the scheduled activity or work. Contact the Permit Office, (775) 834-8300 for more information.

7. The state defers to municipal government for land use development decisions. Public involvement for project related improvements within the NDOT right-of-way should be considered during the municipal land use development public involvement process. Significant public improvements within the NDOT right-of-way developed after the municipal land use development public involvement process may require additional public involvement. It is the responsibility of the permit applicant to perform such additional public involvement. We would encourage such public involvement to be part of a municipal land use development process.

Thank you for the opportunity to review this community development proposal. NDOT reserves the right to incorporate further changes and/or comments as the design review advances. I look forward to working with you and your team, and completing a successful project. If you have any further questions or comments, please contact the Senior Traffic Engineer, Richard Oujevolk, at (775)834-8300.

Sincerely,

DocuSigned by:
32CC95D129D1479...

02/23/2018

Thor A. Dyson, PE

District Engineer

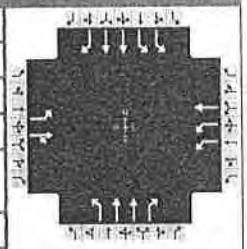
TAD:rmo

cc: Jae Pullen, Engineering Services
Richard Oujevolk, Traffic Office
Paula Diem, Permit Office
NDOT Planning
NDOT Engineering
NDOT Traffic Ops
RTC Washoe
Karen Melby, City of Sparks
File

DS DS

HCS7 : ignalized Intersection Results Su mary

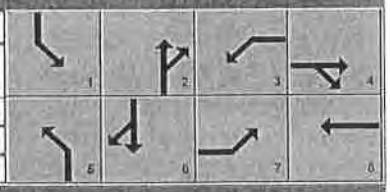
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Mar 8, 2018	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project (650 Lots)	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17aw650.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	273	280	251	23	178		160	514	18	470	1284	443

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	14.0	3.0	50.0	5.0	11.0	17.0	
Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
Red	1.0	0.0	1.0	1.0	0.0	1.0	



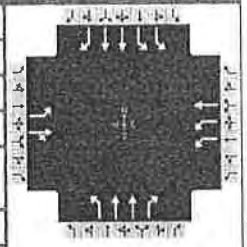
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	21.0	33.0	10.0	22.0	19.0	55.0	22.0	58.0
Change Period, (*Y+R c*), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (*g s*), s	21.8	30.0	2.8	13.9	13.5		19.0	
Green Extension Time (*g e*), s	0.0	0.0	0.0	0.7	0.0	0.0	0.4	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		0.94	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	297	550		25	193		174	559	20	511	1396	373
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1712		1730	1870		1781	1781	1556	1730	1781	1538
Queue Service Time (*g s*), s	19.8	28.0		0.8	11.9		11.5	13.0	0.9	17.0	43.2	21.4
Cycle Queue Clearance Time (*g c*), s	19.8	28.0		0.8	11.9		11.5	13.0	0.9	17.0	43.2	21.4
Green Ratio (*g/C*)	0.18	0.23		0.04	0.14		0.12	0.42	0.42	0.18	0.44	0.44
Capacity (*c*), veh/h	312	399		144	265		208	1484	648	634	1573	679
Volume-to-Capacity Ratio (*X*)	0.952	1.377		0.173	0.730		0.837	0.377	0.030	0.806	0.887	0.549
Back of Queue (*Q*), ft/ln (95 th percentile)	447.8	1234.9		16.5	255.7		263.3	229.3	14.7	306.6	647.7	314
Back of Queue (*Q*), veh/ln (95 th percentile)	17.6	48.6		0.7	10.1		10.4	9.0	0.6	12.1	25.5	12.4
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (*d 1*), s/veh	49.0	46.0		55.5	49.3		51.9	24.2	20.7	47.0	30.8	24.7
Incremental Delay (*d 2*), s/veh	37.9	184.8		0.2	8.6		23.5	0.7	0.1	7.0	7.8	3.2
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	86.9	230.8		55.7	57.9		75.4	24.9	20.8	53.9	38.6	27.9
Level of Service (LOS)	F	F		E	E		E	C	C	D	D	C
Approach Delay, s/veh / LOS	180.4	F		57.7	E		36.5	D		40.3	D	
Intersection Delay, s/veh / LOS	69.5						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.45	B	2.75	C	2.35	B	1.95	B
Bicycle LOS Score / LOS	1.88	B	0.76	A	1.11	A	2.37	B

HCS7 Signalized Intersection Results Summary

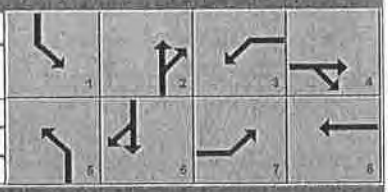
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Mar 8, 2018	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project (650 Lots)	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17pw650.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	356	299	210	32	345		366	1325	20	252	667	221

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	12.0	10.0		46.0	6.0	15.0	21.0					
Yellow	4.0	0.0		4.0	4.0	0.0	4.0					
Red	1.0	0.0		1.0	1.0	0.0	1.0					



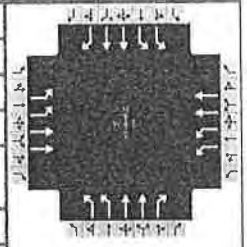
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	26.0	41.0	11.0	26.0	27.0	61.0	17.0	51.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	28.0	38.0	3.3	23.0	29.0		12.1	
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	387	499		35	375		398	1440	22	274	725	197
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1745		1730	1870		1781	1781	1557	1730	1781	1534
Queue Service Time (g_s), s	26.0	36.0		1.3	21.0		27.0	50.2	1.0	10.1	21.5	12.4
Cycle Queue Clearance Time (g_c), s	26.0	36.0		1.3	21.0		27.0	50.2	1.0	10.1	21.5	12.4
Green Ratio (*g/C*)	0.20	0.28		0.05	0.16		0.21	0.43	0.43	0.09	0.35	0.35
Capacity (*c*), veh/h	356	483		160	302		370	1534	671	319	1260	543
Volume-to-Capacity Ratio (*X*)	1.086	1.032		0.218	1.241		1.075	0.939	0.032	0.858	0.575	0.362
Back of Queue (*Q*), ft/ln (95 th percentile)	684.2	770.1		25.1	793.8		675.9	772.9	17.4	224.7	357.3	207.7
Back of Queue (*Q*), veh/ln (95 th percentile)	26.9	30.3		1.0	31.3		26.6	30.4	0.7	8.8	14.1	8.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	52.0	47.0		59.7	54.5		51.5	35.4	21.4	58.2	34.1	31.1
Incremental Delay (d_2), s/veh	72.7	49.5		0.3	133.5		68.3	12.4	0.1	19.3	1.9	1.9
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	124.7	96.5		60.0	188.0		119.8	47.8	21.4	77.5	36.0	33.0
Level of Service (LOS)	F	F		E	F		F	D	C	E	D	C
Approach Delay, s/veh / LOS	108.8	F		177.1	F		62.9	E		45.0	D	
Intersection Delay, s/veh / LOS	78.1						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.45	B	2.66	C	2.85	C	2.00	B
Bicycle LOS Score / LOS	1.95	B	0.45	A	2.02	B	1.47	A

HCS7 Signalized Intersection Results Summary

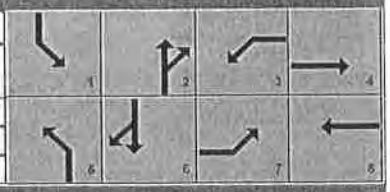
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Mar 8, 2018	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project (1800 Lots)	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name			
Project Description	w/Improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	364	431		23	229		251	514	18	470	1284	474

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	16.0	3.0		47.0	10.0	5.0	19.0					
Yellow	4.0	0.0		4.0	4.0	0.0	4.0					
Red	1.0	0.0		1.0	1.0	0.0	1.0					



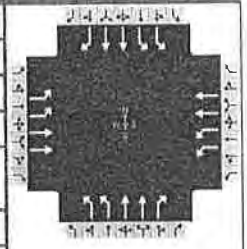
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	20.0	29.0	15.0	24.0	21.0	52.0	24.0	55.0
Change Period, (Y+R c), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (MAH), s	3.1	3.0	3.0	3.0	2.9	0.0	2.9	0.0
Queue Clearance Time (g s), s	14.9	16.5	2.8	9.6	10.9		18.6	
Green Extension Time (g e), s	0.5	1.2	0.0	1.3	0.3	0.0	0.6	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.21	0.08	0.00	0.03	0.10		0.17	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4		3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	396	468		25	249		273	559	20	511	1396	407
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781		1730	1781		1730	1781	1556	1730	1781	1556
Queue Service Time (g s), s	12.9	14.5		0.8	7.6		8.9	13.6	0.9	16.6	45.1	24.8
Cycle Queue Clearance Time (g c), s	12.9	14.5		0.8	7.6		8.9	13.6	0.9	16.6	45.1	24.8
Green Ratio (g/C)	0.17	0.20		0.08	0.16		0.13	0.39	0.39	0.20	0.42	0.42
Capacity (c), veh/h	577	712		288	564		461	1395	609	692	1484	648
Volume-to-Capacity Ratio (X)	0.686	0.658		0.087	0.441		0.592	0.401	0.032	0.738	0.941	0.627
Back of Queue (Q), ft/ln (95 th percentile)	245.4	272.2		15.6	150.4		172.5	239.4	15.5	292.6	705.2	363.6
Back of Queue (Q), veh/ln (95 th percentile)	9.7	10.7		0.6	5.9		6.8	9.4	0.6	11.5	27.8	14.3
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	47.0	44.2		50.8	45.7		48.9	26.3	22.5	45.1	33.6	27.6
Incremental Delay (d 2), s/veh	2.8	1.8		0.0	0.2		1.4	0.9	0.1	3.7	12.9	4.5
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	49.9	46.0		50.8	45.9		50.3	27.2	22.6	48.7	46.5	32.2
Level of Service (LOS)	D	D		D	D		D	C	C	D	D	C
Approach Delay, s/veh / LOS	47.8	D		46.4	D		34.5	C		44.5	D	
Intersection Delay, s/veh / LOS	43.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.60	C	2.74	C	2.51	C	2.47	B
Bicycle LOS Score / LOS	1.18	A	0.67	A	1.19	A	2.40	B

HCS7 Signalized Intersection Results Summary

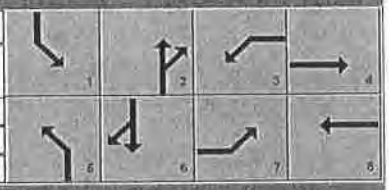
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Mar 8, 2018	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project (1800 Lots)	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name			
Project Description	w/Improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	404	378		32	479		607	1325	20	252	667	302

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	14.0	40.0	6.0	13.0	22.0	
Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
Red	1.0	0.0	1.0	1.0	0.0	1.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	24.0	40.0	11.0	27.0	34.0	59.0	20.0	45.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.0	3.0	3.0	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	17.4	14.4	3.3	20.5	24.6		11.9	
Green Extension Time (g_e), s	0.7	2.1	0.0	0.5	1.2	0.0	0.2	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.08	0.00	1.00	1.00	0.02		0.83	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4		3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	439	411		35	521		660	1440	22	274	725	263
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781		1730	1781		1730	1781	1556	1730	1781	1553
Queue Service Time (g_s), s	15.4	12.4		1.3	18.5		22.6	51.6	1.1	9.9	23.0	18.4
Cycle Queue Clearance Time (g_c), s	15.4	12.4		1.3	18.5		22.6	51.6	1.1	9.9	23.0	18.4
Green Ratio (g/C)	0.18	0.27		0.05	0.17		0.26	0.42	0.42	0.12	0.31	0.31
Capacity (c), veh/h	639	959		160	603		905	1479	646	399	1096	478
Volume-to-Capacity Ratio (X)	0.688	0.429		0.218	0.864		0.729	0.974	0.034	0.686	0.662	0.551
Back of Queue (Q), ft/ln (95 th percentile)	282.9	234.6		25.1	355.2		371.6	823.8	18	198.3	386.5	296.3
Back of Queue (Q), veh/ln (95 th percentile)	11.1	9.2		1.0	14.0		14.6	32.4	0.7	7.8	15.2	11.7
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	49.5	39.2		59.7	52.5		43.8	37.3	22.5	55.2	39.1	37.5
Incremental Delay (d_2), s/veh	2.6	0.1		0.3	11.9		2.6	17.9	0.1	4.1	3.1	4.5
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	52.1	39.4		60.0	64.4		46.4	55.2	22.6	59.3	42.3	42.0
Level of Service (LOS)	D	D		E	E		D	E	C	E	D	D
Approach Delay, s/veh / LOS	45.9	D		64.2	E		52.1	D		45.9	D	
Intersection Delay, s/veh / LOS	50.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.59	C	2.69	C	3.00	C	2.48	B
Bicycle LOS Score / LOS	1.17	A	0.59	A	2.24	B	1.53	B

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THE QUARRY

TRAFFIC STUDY

SEPTEMBER, 2017

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THE QUARRY

TRAFFIC STUDY

EXECUTIVE SUMMARY

The Quarry will be located in the City of Sparks, Nevada. The project site is located north of Highland Ranch Parkway and west of Pyramid Highway. This study also includes analysis of Kiley Ranch land uses located west of Pyramid Highway between Highland Ranch Parkway and Lazy 5 Parkway. The purpose of this study is to address the project's impact upon the adjacent street network. The Highland Ranch Parkway/Pyramid Highway, Highland Ranch Parkway/Project Access, and Highland Ranch Parkway/Frontage Road intersections have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, existing plus project plus Kiley Ranch, 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios. The Pyramid Highway intersections with Los Altos Parkway and Lazy 5 Parkway have been identified for trip distribution and assignment analysis only. Pyramid Highway and Highland Ranch Parkway in the vicinity of the site have been identifies for roadway capacity analysis for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios.

The Quarry will include the construction of 1,223 single family detached homes and a 13 acre mini-storage facility. The Kiley Ranch land uses will consist of two convenience stores with gas pumps for a total of 8,000 square feet, three fast food restaurants with drive-through lanes totaling 10,500 square feet, two sit-down restaurants totaling 10,000 square feet, 30,000 square feet of retail buildings, two automotive service buildings totaling 16,000 square feet, a car wash with 4 bays, and an 8 acre mini-storage facility. The Quarry is anticipated to generate 10,974 average weekday trips with 900 trips occurring during the AM peak hour and 1,046 trips occurring during the PM peak hour. Kiley Ranch is anticipated to generate 15,936 average weekday trips with 1,003 trips occurring during the AM peak hour and 1,092 trips occurring during the PM peak hour.

Traffic generated by The Quarry will have some impact the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping or traffic control improvements comply with City of Sparks and Nevada Department of Transportation requirements.

It is recommended that Highland Ranch Parkway be widened to four lanes from Pyramid Highway to the Project Access.

It is recommended that the Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection be improved to include dual left turn lanes, two through lanes, and one right turn lane at the east and west approaches and dual left turn lanes at the south approach. The dual left turn pocket at the west approach should contain 545 feet of storage/deceleration length and the dual left turn pocket at the south approach should contain 740 feet of storage/deceleration length.

It is recommended that the Highland Ranch Parkway/Project Access intersection be improved as three-leg traffic signal controlled intersection with one left turn lane and one through lane at the west approach, one through lane and one right turn lane at the east approach, and dual left turn lanes and one right turn lane at the north approach. The left turn pocket at the west approach should contain 370 feet of storage/deceleration length and the dual left turn pocket at the north approach should contain 365 feet of storage/deceleration length.

INTRODUCTION

STUDY AREA

The Quarry will be located in the City of Sparks, Nevada. The project site is located north of Highland Ranch Parkway and west of Pyramid Highway. Figure 1 shows the location of the project site. This study also includes analysis of Kiley Ranch land uses located west of Pyramid Highway between Highland Ranch Parkway and Lazy 5 Parkway. The purpose of this study is to address the project's impact upon the adjacent street network. The Highland Ranch Parkway/Pyramid Highway, Highland Ranch Parkway/Project Access, and Highland Ranch Parkway/Frontage Road intersections have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, existing plus project plus Kiley Ranch, 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios. The Pyramid Highway intersections with Los Altos Parkway and Lazy 5 Parkway have been identified for trip distribution and assignment analysis only. Pyramid Highway and Highland Ranch Parkway in the vicinity of the site have been identified for roadway capacity analysis for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios.

EXISTING AND PROPOSED LAND USES

The project site encompasses an old gravel pit and undeveloped land. Adjacent properties generally include undeveloped land with some scattered dwelling units to the north and west. The Quarry will include the construction of 1,223 single family homes and a 13 acre mini-storage facility. The Kiley Ranch land uses will consist of two convenience stores with gas pumps totaling 8,000 square feet, three fast food restaurants with drive-through lanes totaling 10,500 square feet, two sit-down restaurants totaling 10,000 square feet, 30,000 square feet of retail buildings, two automotive service buildings totaling 16,000 square feet, a 4-bay car wash, and an 8 acre mini-storage facility.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

Pyramid Highway is a four-lane roadway with two through lanes in each direction in the vicinity of the site. The speed limit is posted for 55 miles per hour in the vicinity of the site. Roadway improvements include bicycle lanes, striped edge lines, and paved shoulders on both sides of the roadway. A striped centerline exists south of Highland Ranch Parkway and a raised center median exists north of Highland Ranch Parkway.

Highland Ranch Parkway is a two-lane roadway with one through lane in each direction west of Pyramid Highway. The speed limit is posted for 45 miles per hour with a 35 mile per hour advisory speed limit near the project site. Roadway improvements include striped edge and center lines and paved and graded shoulders.

Sparks Boulevard is a four-lane roadway with two through lanes in each direction east of Pyramid Highway. The speed limit is posted for 40 miles per hour. Roadway improvements include curb, gutter, sidewalk, and bike lanes on both sides of the street and a raised center median with left turn pockets at major intersections.

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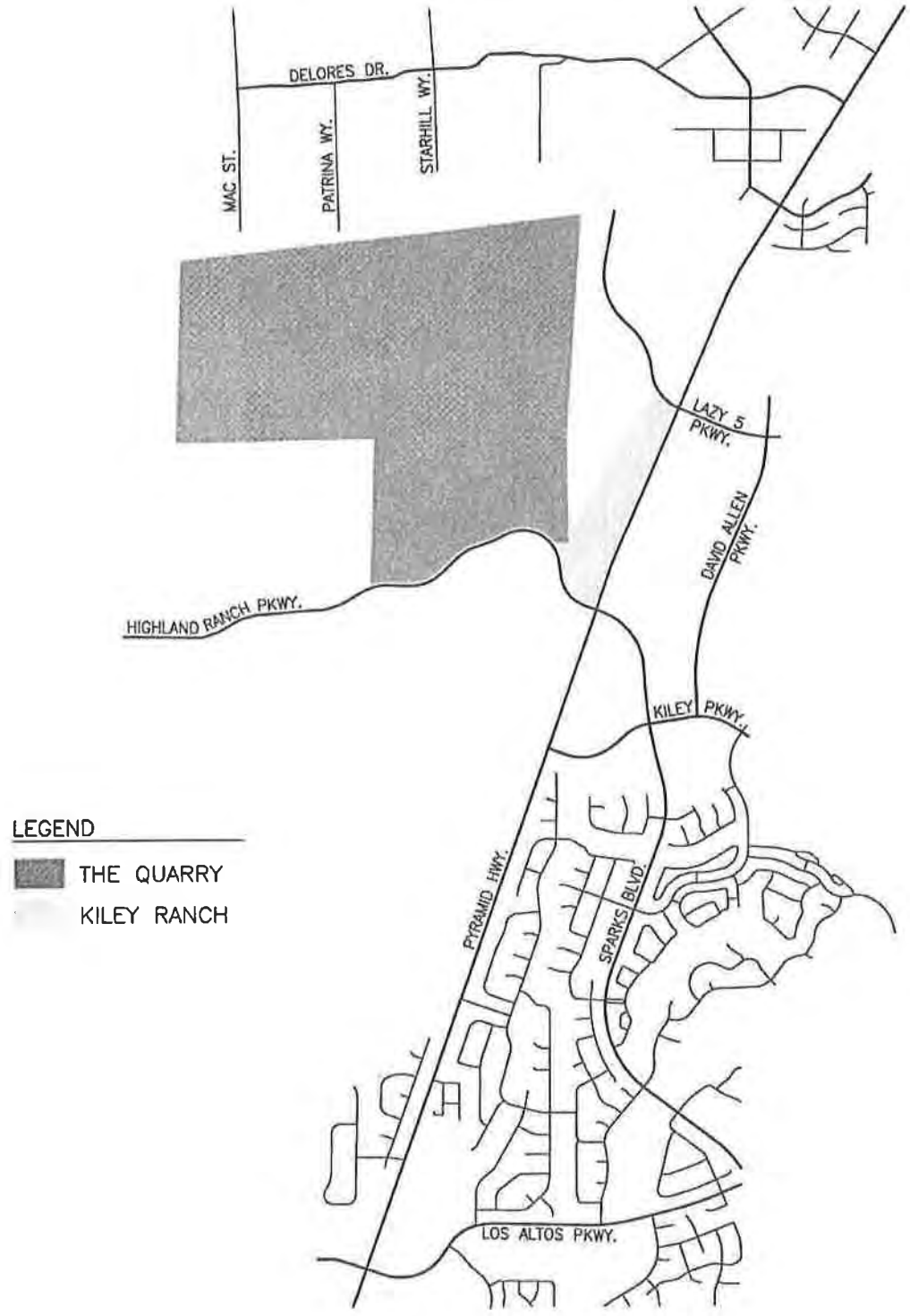

THE QUARRY

VICINITY MAP
FIGURE 1

The Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection is a signalized four-leg intersection with protected phasing for all left turn movements. The north approach contains dual left turn lanes, two through lanes, and one right turn lane. The south approach contains one left turn lane, two through lanes, and one right turn lane. The east approach contains dual left turn lanes, one through lane, and one free right turn lane with a northbound acceleration lane. The west approach contains one left turn lane and one shared through-right turn lane with a southbound acceleration lane. Pedestrian crosswalks exist at all approaches.

The Highland Ranch Parkway/Project Access intersection is an unsignalized three-leg intersection with stop control at the north approach. The intersection contains one shared left turn-through lane at the west approach, one shared through-right turn lane at the east approach, and one shared left turn-right turn lane at the north approach. The north approach served a gravel pit but is now gated.

The Highland Ranch Parkway/Frontage Road intersection does not currently exist but is anticipated to be a typical three-leg intersection with full turning movements allowed. The Highland Ranch Parkway/Frontage Road intersection will provide access to Kiley Ranch.

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed project on the key intersections, trip generation rates and peak hours had to be determined. Trip generation rates were obtained from the Ninth Edition of *ITE Trip Generation* (2012). Trip generation was calculated for the peak hours occurring between 7:00 and 9:00 AM and 4:00 and 6:00 PM which correspond to the peak hours of adjacent street traffic. The Quarry will include the construction of 1,223 single family homes and 13 acres of mini-storage. ITE Land Uses 151: Mini-Warehouse and 210: Single Family Detached Housing was used to calculate trips generated by The Quarry. Table 1 shows a summary of the average daily traffic (ADT) volumes and peak hour volumes generated by The Quarry.

TABLE 1
THE QUARRY TRIP GENERATION

LAND USE	ADT	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Single Family (1,223 DU)	10,513	217	649	866	630	370	1,000
Mini-Warehouse (13 AC)	461	15	19	34	23	23	46
Total	10,974	232	668	900	653	393	1,046

Kiley Ranch will consist of two convenience stores with gas pumps for a total of 8,000 square feet, three fast food restaurants with drive-through lanes totaling 10,500 square feet, two sit-down restaurants totaling 10,000 square feet, 30,000 square feet of retail buildings, two automotive service buildings totaling 16,000 square feet, a car wash with 4 bays, and an 8 acre mini-storage facility. ITE Land Uses 151: Mini-Warehouse, 820: Shopping Center, 843: Automobile Parts Sales, 848: Tire Store, 853: Convenience Market with Gasoline Pumps, 932: High-Turnover (Sit-Down) Restaurant, 934: Fast Food Restaurant with Drive-Thru, and 947: Self-Service Car Wash were used to calculate trips generated by Kiley Ranch.

Table 2 shows a summary of the average daily traffic (ADT) volumes and AM and PM peak hour traffic volumes generated by Kiley Ranch.

TABLE 2
KILEY RANCH TRIP GENERATION

LAND USE	ADT	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Convenience Market w/Gas (8,000 SF)	6,765	164	163	327	204	203	407
Fast Food w/Drive-Thru (10,500 SF)	5,209	243	234	477	178	165	343
Sit-Down Restaurant (10,000 SF)	1,272	59	49	108	59	40	99
Shopping Center (30,000 SF)	1,281	18	11	29	53	58	111
Auto Parts Sales (8,000 SF)	495	9	9	18	24	24	48
Tire Store (8,000 SF)	199	14	9	23	14	19	33
Car Wash (4 Bays)	432	0	0	0	11	11	22
Mini-Storage (8 AC)	283	9	12	21	15	14	29
Total	15,936	516	487	1,003	558	534	1,092

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of project trips to the key intersections was estimated based on existing and future peak hour traffic patterns and the locations of attractions and productions in the area. Separate trip distribution schemes were developed for The Quarry and Kiley Ranch. The trip generation volumes were subsequently assigned to the key intersections based on the trip distribution. Figure 2 shows the trip distribution and assignment for The Quarry. Figure 3 shows the trip distribution and assignment for Kiley Ranch. Access to Kiley Ranch will be provided from Highland Ranch Parkway and Lazy 5 Parkway via the Frontage Road and from Pyramid Highway via two right-in/right-out only driveways.

EXISTING AND PROJECTED TRAFFIC VOLUMES

Figure 4 shows the existing traffic volumes at the key intersections during the AM and PM peak hours. The existing traffic volumes were obtained from weekday counts conducted in September of 2017. Figure 5 shows the existing plus project traffic volumes during the AM and PM peak hours. Figure 6 shows the existing plus project plus Kiley Ranch traffic volumes at the key intersections. Figure 7 shows the 2035 base traffic volumes. The 2035 base average daily traffic volumes were obtained directly from RTC's traffic forecasting model and the peak hour volumes were then estimated based on the average daily traffic volumes. Peak hour factors and directional splits obtained from actual hourly traffic data on Pyramid Highway, Sparks Boulevard, and Highland Ranch Parkway were applied to the average daily traffic volumes in order to obtain peak hour directional link volumes at each leg of the intersection. Peak hour intersection turning movements were then estimated based on manually balancing entering and departing volumes at the intersection. Figure 8 shows the 2035 base plus project traffic volumes at the key intersections during the AM and PM peak hours. Figure 9 shows the 2035 base plus project plus Kiley Ranch traffic volumes at the key intersections during the AM and PM peak hours.

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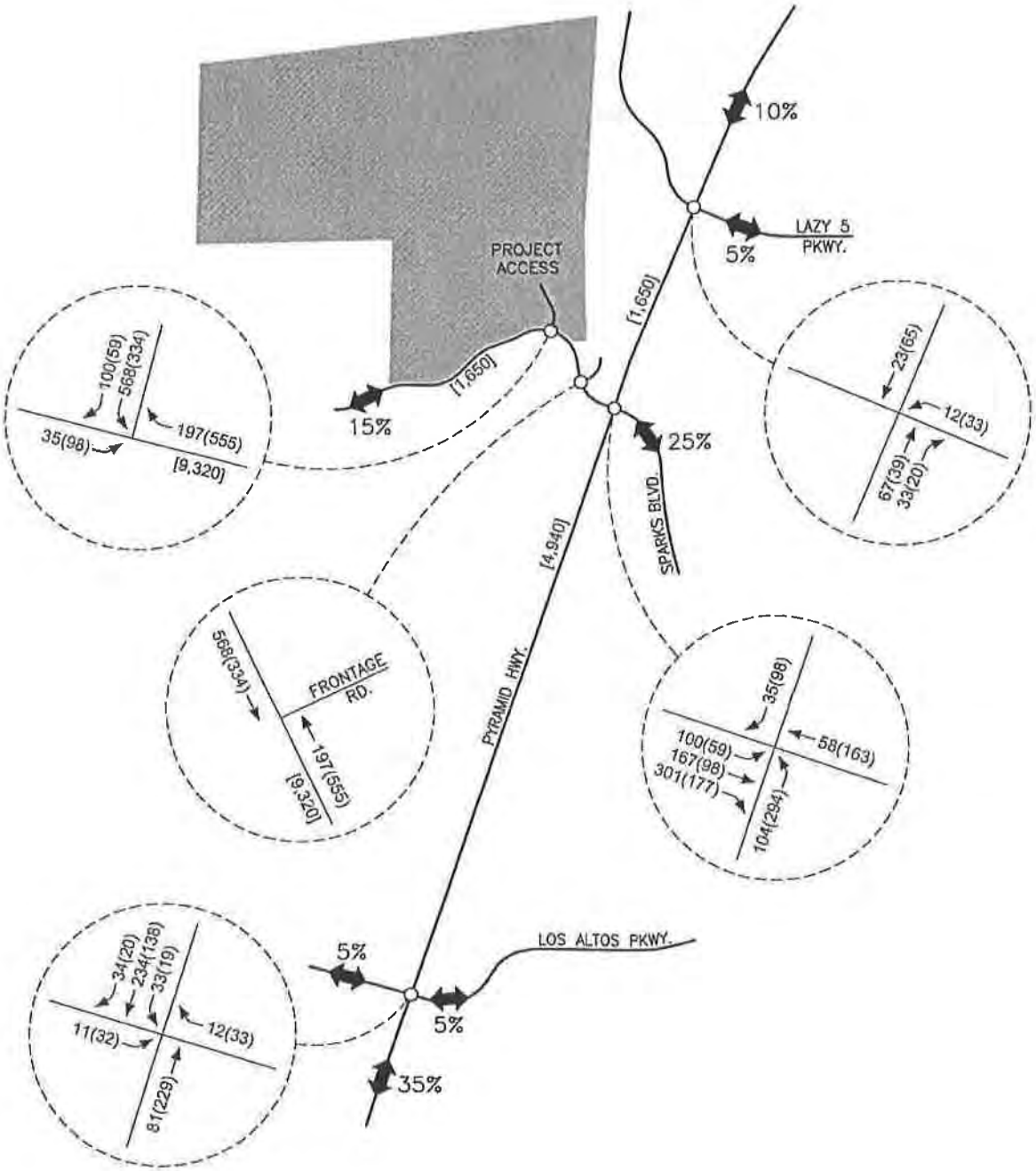
LEGEND
- AM PEAK HOUR
(-) PM PEAK HOUR
[-] AVERAGE DAILY TRAFFIC



THE QUARRY

THE QUARRY TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 2

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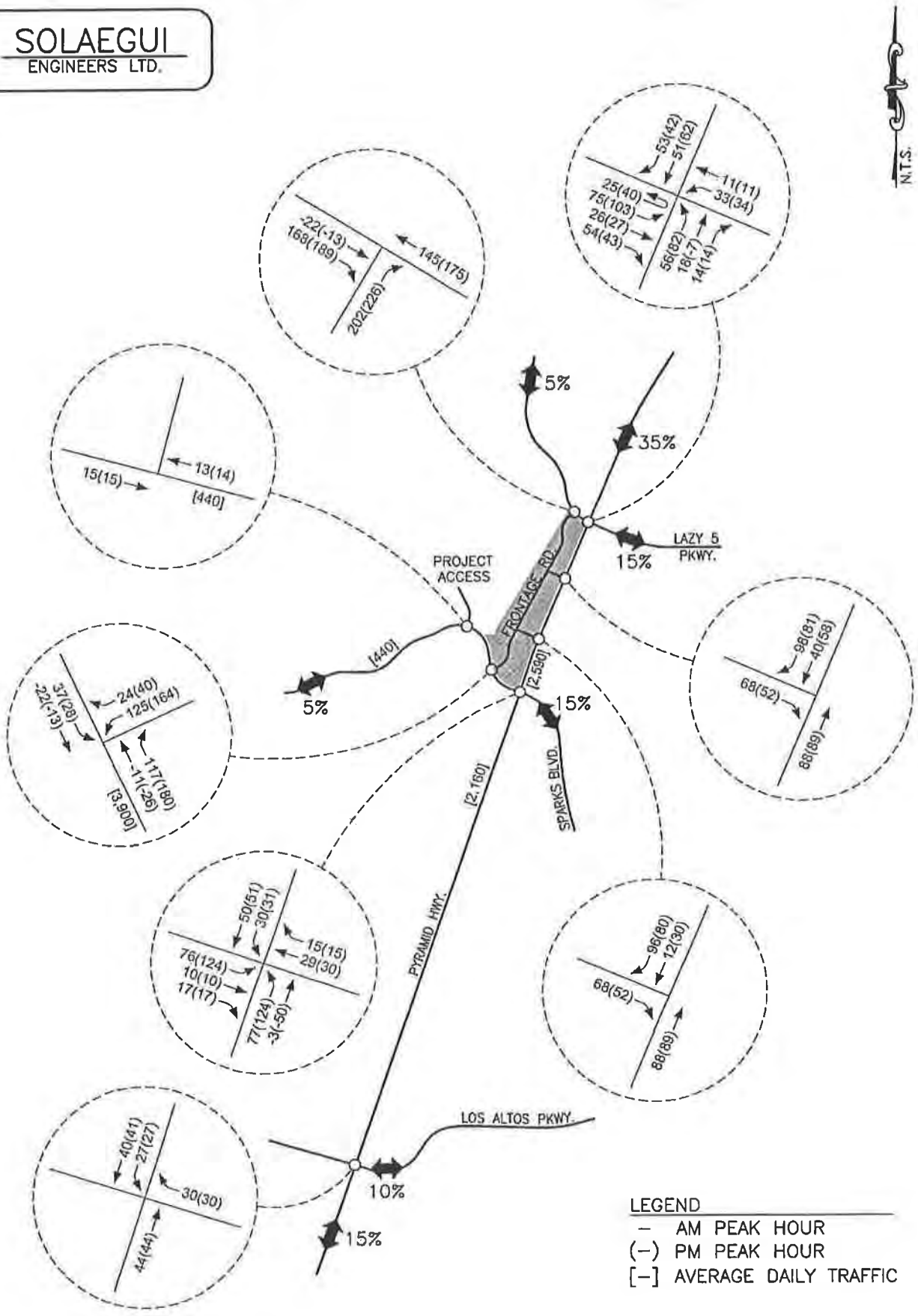

THE QUARRY

KILEY RANCH TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 3

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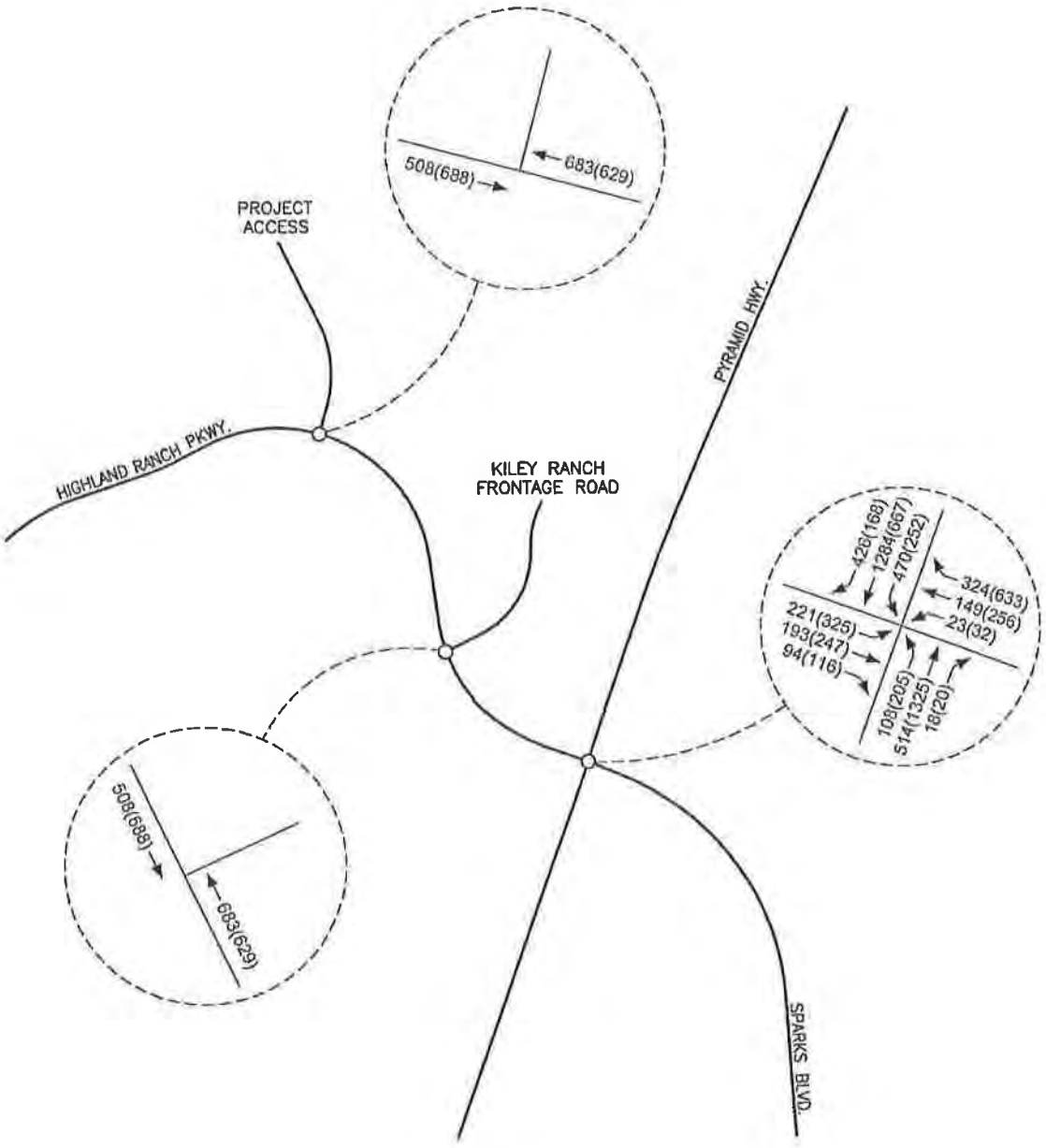
N.T.S.

LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR



THE QUARRY

EXISTING TRAFFIC VOLUMES
FIGURE 4

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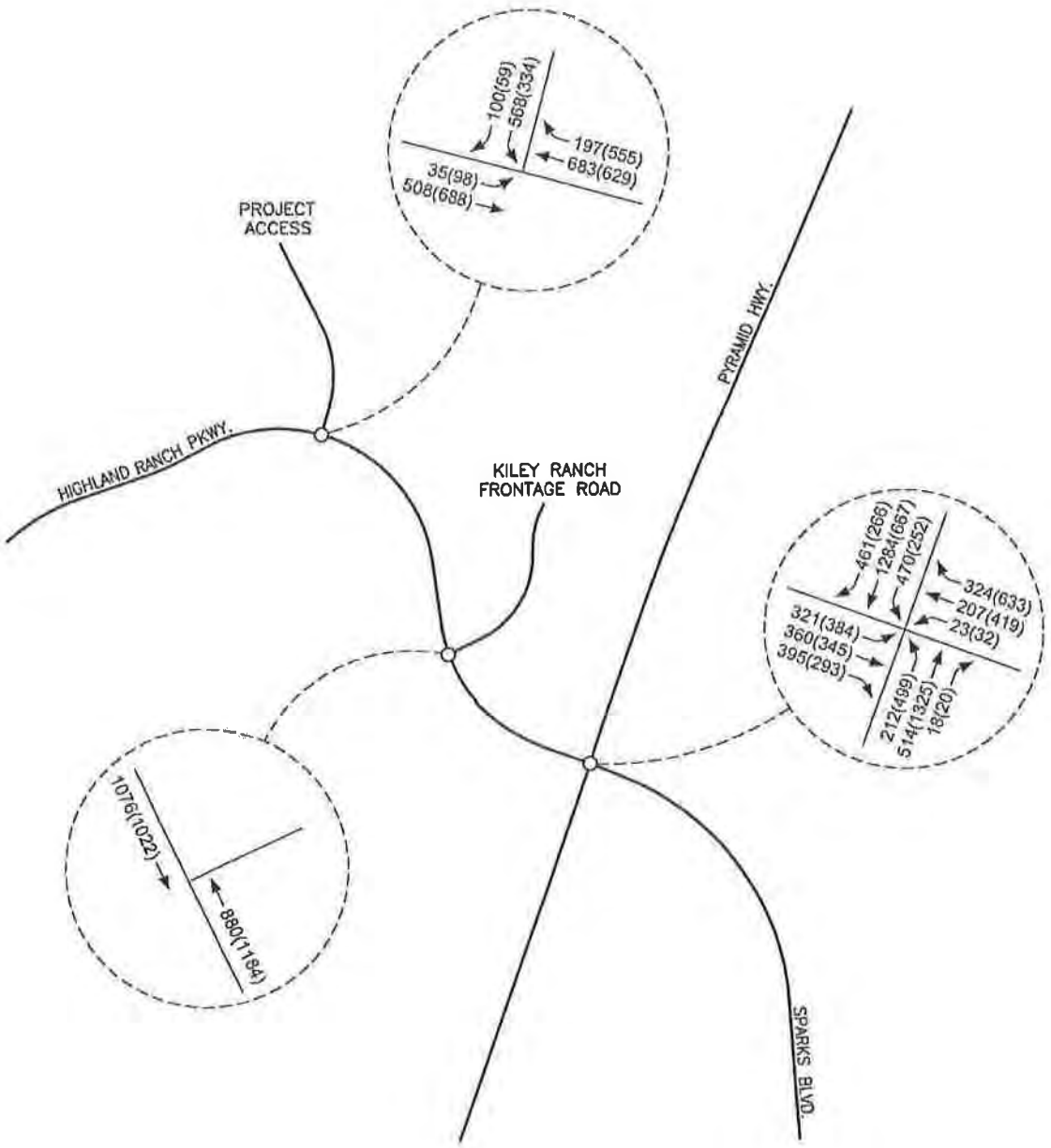
N.T.S.

LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR



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EXISTING + PROJECT TRAFFIC VOLUMES
FIGURE 5

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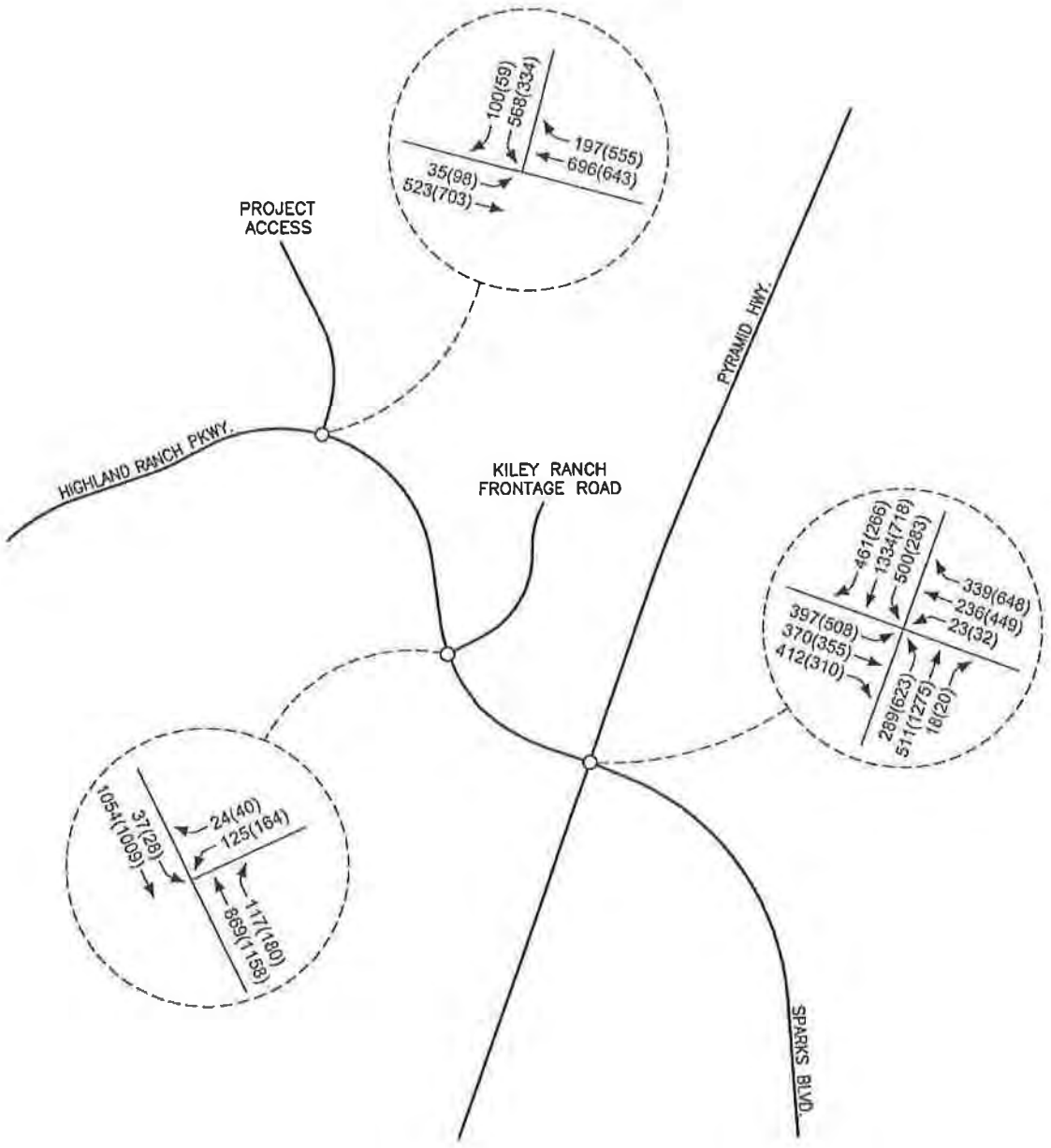
N.T.S.

LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR



THE QUARRY

EXISTING + PROJECT + KILEY RANCH TRAFFIC VOLUMES
FIGURE 6

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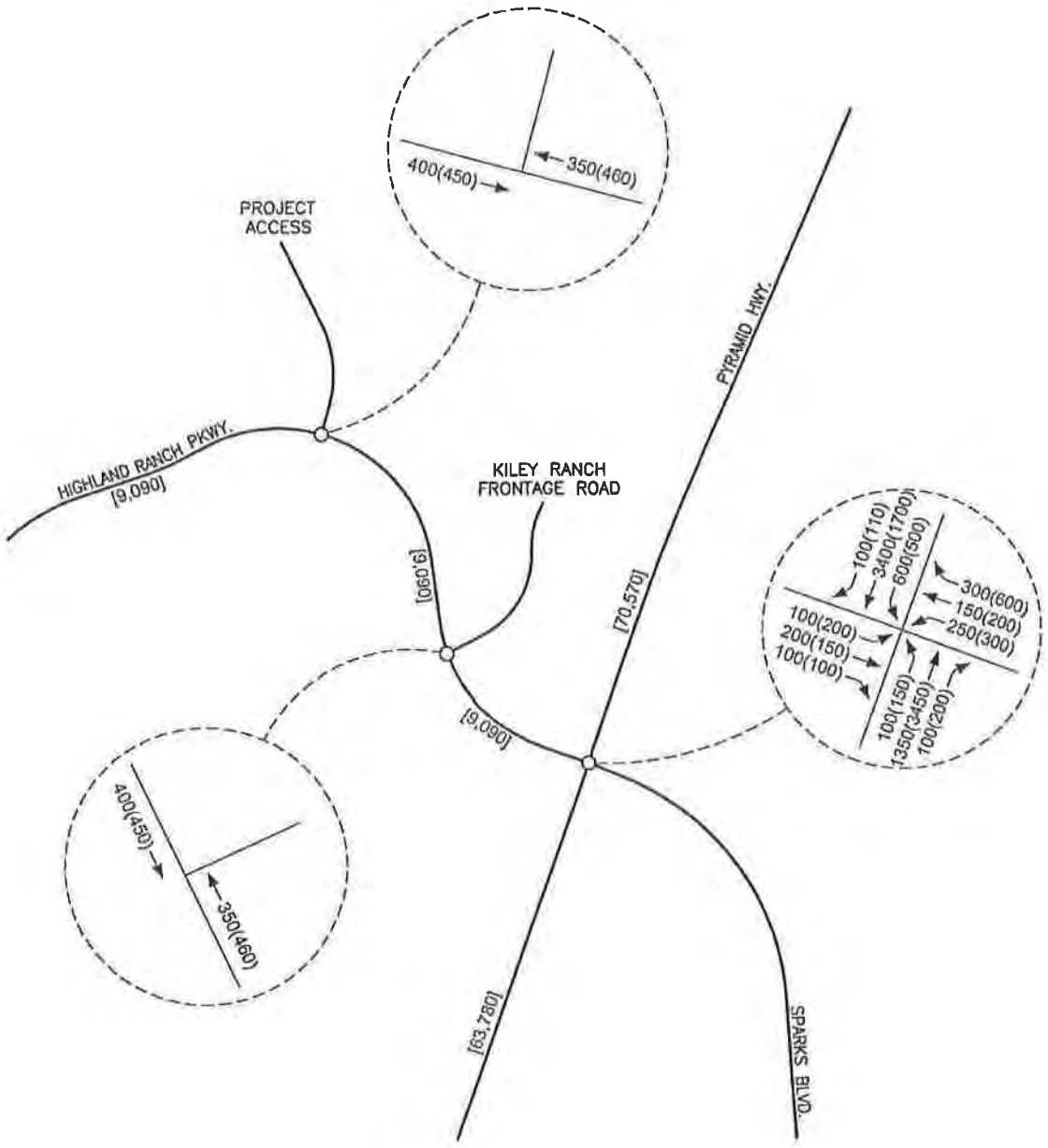
N.T.S.

LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR
[–] AVERAGE DAILY TRAFFIC



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2035 BASE TRAFFIC VOLUMES
FIGURE 7

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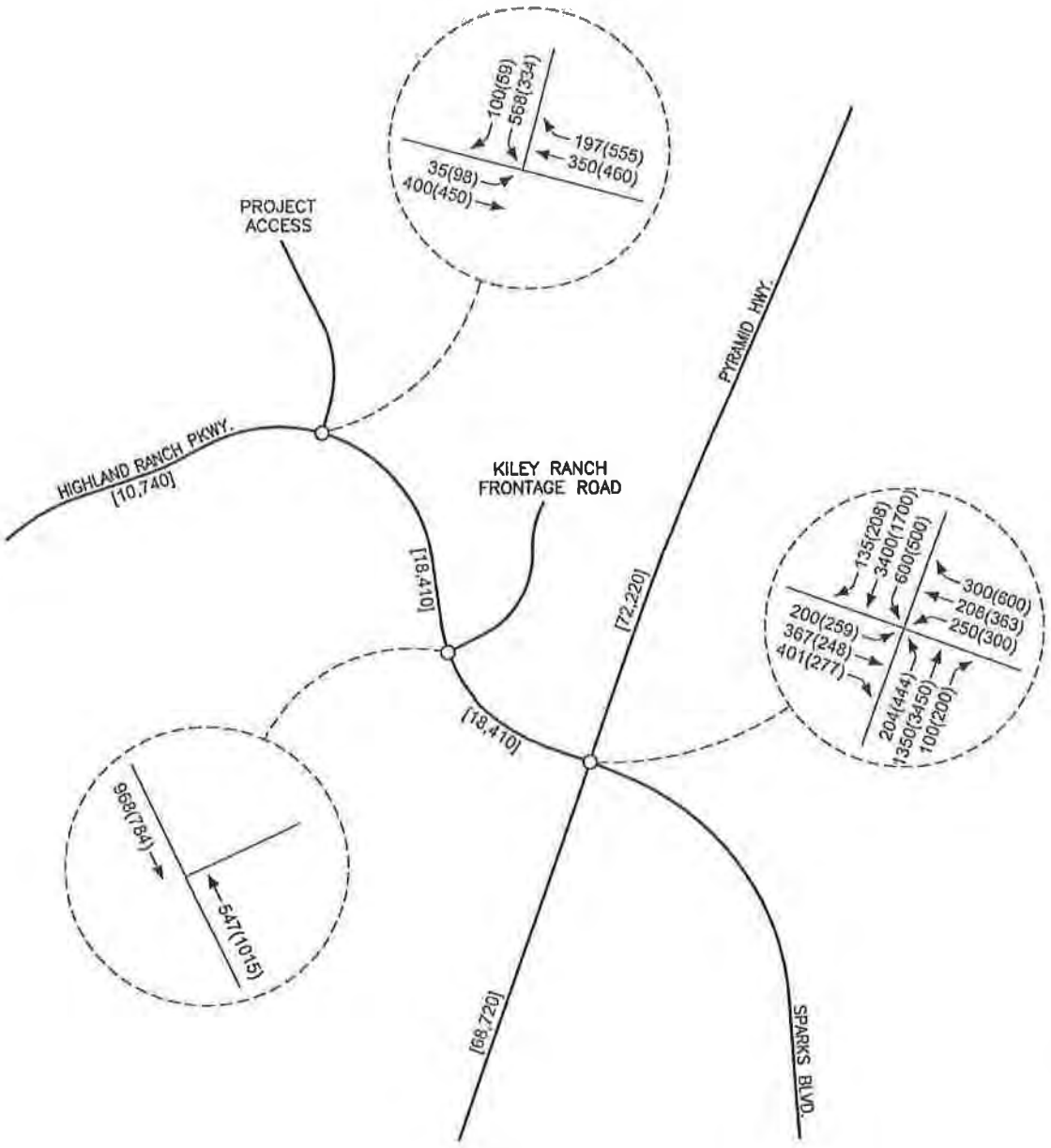
N.T.S.

LEGEND
- AM PEAK HOUR
(-) PM PEAK HOUR
[-] AVERAGE DAILY TRAFFIC



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2035 BASE + PROJECT TRAFFIC VOLUMES
FIGURE 8

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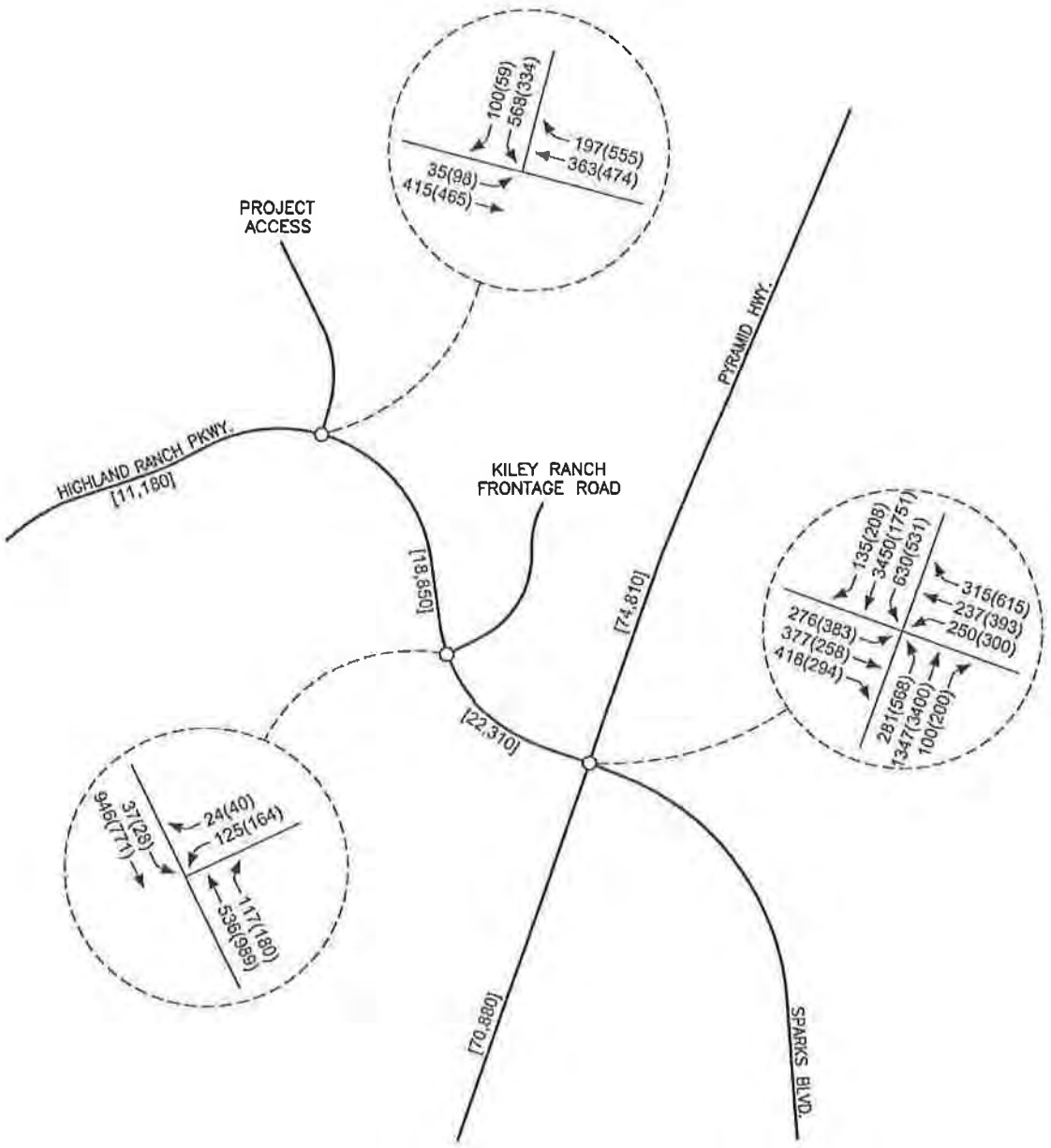
N.T.S.

LEGEND
-- AM PEAK HOUR
(–) PM PEAK HOUR
[–] AVERAGE DAILY TRAFFIC



THE QUARRY

2035 BASE + PROJECT + KILEY RANCH VOLUMES
FIGURE 9

ROADWAY CAPACITY ANALYSIS

Pyramid Highway and Highland Ranch Parkway in the vicinity of the site were identified for roadway capacity analysis. Roadway capacity is based on average daily level of service thresholds established by the Regional Transportation Commission. The 2040 Regional Transportation Plan indicates that LOS standards used for assessing the need for street and highway improvements at a planning level are LOS D for all regional roadway facilities projected to carry less than 27,000 ADT and LOS E for all regional roadway facilities projected to carry 27,000 or more ADT. The LOS standard is LOS D for Highland Ranch Parkway and LOS E for Pyramid Highway based on the 2035 base traffic volumes. The 2040 Regional Transportation Plan indicates that Pyramid Highway is classified as an arterial with high access control and Highland Ranch Parkway is classified as an arterial with moderate access control. Table 3 shows the average daily level of service thresholds for high and moderate access control arterials.

TABLE 3
LEVEL OF SERVICE CRITERIA FOR ROADWAY SEGMENTS

FACILITY/LANES	AVERAGE DAILY TRAFFIC VOLUME			
	LOS C	LOS D	LOS E	LOS F
Arterial with High Access Control				
4 Lanes	≤36,100	36,101-38,400	38,401-40,600	>40,600
6 Lanes	≤54,700	54,701-57,600	57,601-60,900	>60,900
8 Lanes	≤73,200	73,201-76,800	76,801-81,300	>81,300
Arterial with Moderate Access Control				
2 Lanes	≤14,800	14,801-17,500	17,501-18,600	>18,600
4 Lanes	≤32,200	32,201-35,200	35,201-36,900	>36,900
6 Lanes	≤49,600	49,601-52,900	52,901-55,400	>55,400

Pyramid Highway and Highland Ranch Parkway were subsequently reviewed for capacity based on the 2035 average daily traffic volumes presented on Figures 7-9 and the level of service thresholds presented above. Table 4 shows a summary of the roadway segment level of service results for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch traffic volumes.

TABLE 4
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS

ROADWAY SEGMENT	2035 BASE		2035 BASE + PROJECT		2035 BASE + PROJECT + KILEY	
	ADT	LOS	ADT	LOS	ADT	LOS
Pyramid Highway north of Highland Ranch						
4-Lane High Access Control Arterial (Existing)	70,570	F	72,220	F	74,810	F
6-Lane High Access Control Arterial	70,570	F	72,220	F	74,810	F
8-Lane High Access Control Arterial (Needed)	70,570	C	72,220	C	74,810	D

TABLE 4 (CONTINUED)
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS

ROADWAY SEGMENT	2035 BASE		2035 BASE + PROJECT		2035 BASE + PROJECT + KILEY	
	ADT	LOS	ADT	LOS	ADT	LOS
Pyramid Highway south of Highland Ranch						
4-Lane High Access Control Arterial (Existing)	63,780	F	68,720	F	70,880	F
6-Lane High Access Control Arterial	63,780	F	68,720	F	70,880	F
8-Lane High Access Control Arterial (Needed)	63,780	C	68,720	C	70,800	C
Highland Ranch between Pyramid and Frontage Road						
2-Lane Moderate Access Control Arterial (Existing)	9,090	C	18,410	E	22,310	F
4-Lane Moderate Access Control Arterial (Needed)			18,410	C	22,310	C
Highland Ranch between Frontage Road & Project Access						
2-Lane Moderate Access Control Arterial (Existing)	9,090	C	18,410	E	18,850	F
4-Lane Moderate Access Control Arterial (Needed)			18,410	C	18,850	C
Highland Ranch west of Project Access						
2-Lane Moderate Access Control Arterial (Existing)	9,090	C	10,740	C	11,180	C

As shown in Table 4, the existing four-lane segment of Pyramid Highway north and south of Highland Ranch Parkway operates at LOS F for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch traffic volumes. This roadway segment will need to be widened to eight lanes in order to maintain policy LOS E or better operation based on the high access control arterial level of service thresholds. However, RTC's 2040 Regional Transportation Plan indicates that the US-395 Connector is planned to be constructed to Pyramid Highway in the 2027-2040 timeframe. The Pyramid Highway/US-395 Connection Project indicates that a six-lane "high speed" high access control arterial is the preferred alternative for the Pyramid Highway/US-395 Connector north and south of Sparks Boulevard. Capacity thresholds for a high speed high access control arterial are not available but it is anticipated that the proposed six-lane section for this new roadway will provide LOS E or better operation for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios.

The existing two-lane segment of Highland Ranch Parkway from Pyramid Highway to the Project Access operates at LOS C for the 2035 base traffic volumes, LOS E for the 2035 base plus project traffic volumes, and LOS F for the 2035 base plus project plus Kiley Ranch traffic volumes and the existing two-lane segment west of the Project Access operates at LOS C for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch traffic volumes. This segment of Highland Ranch Parkway will therefore need to be widened to four lanes in order to maintain policy LOS D or better operation for the 2035 base plus project and 2035 base plus project plus Kiley Ranch scenarios. No capacity improvements are planned for Highland Ranch Parkway in RTC's 2040 Regional Transportation Plan. It is recommended that Highland Ranch Parkway be widened to four lanes from Pyramid Highway to the Project Access in order to serve project traffic volumes.

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual (6th Edition)*, prepared by the Transportation Research Board, for unsignalized and signalized intersections using the latest version of the Highway Capacity Software.

The result of capacity analysis is a level of service (LOS) rating for each signalized intersection, roundabout, all-way stop controlled intersection, or minor movement at a two-way stop controlled intersection. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the intersection or minor movement.

The *Highway Capacity Manual* defines level of service for two-way stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the two-way stop controlled intersection as a whole but is assigned to all-way stop controlled intersections and roundabouts. The level of service criteria for unsignalized intersections is shown in Table 5.

TABLE 5
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Level of service for signalized intersections is stated in terms of the average control delay per vehicle for a peak 15 minute analysis period. The level of service criteria for signalized intersections is shown in Table 6.

TABLE 6
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Table 7 shows a summary of the level of service and delay results for the existing, existing plus project, existing plus project plus Kiley Ranch, 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios. The capacity worksheets are included in the Appendix.

TABLE 7
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS

	EXISTING		EXISTING + PROJECT		EXISTING + PROJECT + KILEY		2035 BASE		2035 BASE + PROJECT		2035 BASE + PROJECT + KILEY	
INTERSECTION	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Pyramid/Highland Ranch												
Signal w/Exist. Lanes	D40	D54	F136	F137	F165	F189	F193	F327	F321	F359	F349	F376
Signal w/Added Lanes	N/A	N/A	D43	D49	D46	D50	C34	D52	D38	E58	D42	E66
Interchange w/Signal												
NB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	B16	C21	B17	C22.0	B17	C24
SB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	C23	B19	C23	B19	C23	B20
Highland Ranch/Access												
Signal	N/A	N/A	C23	B19	C24	B20	N/A	N/A	B18	B19	B18	B19
Highland Ranch/Frontage												
Stop at North Leg	N/A	N/A	N/A	N/A	B11	B13	N/A	N/A	N/A	N/A	A9	B12
EB Left	N/A	N/A	N/A	N/A	F353	F999	N/A	N/A	N/A	N/A	F61	F392
SB Left	N/A	N/A	N/A	N/A	B12	B14	N/A	N/A	N/A	N/A	B10	B13
SB Right												

Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard Intersection

The Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection was initially analyzed as a signalized four-leg intersection with the existing approach lanes for all scenarios. The intersection currently operates at LOS D with a delay of 40 seconds per vehicle during the AM peak hour and 54 seconds per vehicle during the PM peak hour. For the existing plus project traffic volumes the intersection operates at LOS F with a delay of 136 seconds per vehicle during the AM peak hour and 137 seconds per vehicle during the PM peak hour. For the existing plus project plus Kiley Ranch traffic volumes the intersection operates at LOS F with a delay of 165 seconds per vehicle during the AM peak hour and 189 seconds per vehicle during the PM peak hour. The intersection will continue to operate at LOS F with high delays for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch traffic volumes.

The signalized Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection was subsequently re-analyzed for capacity with additional approach lanes. For the existing plus project and existing plus project plus Kiley Ranch traffic volumes the intersection operates at LOS D during the AM and PM peak hours with dual left turn lanes, two through lanes, and one free right turn lane at the east and west approaches and dual left turn lanes at the south approach. For the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch traffic volumes the intersection operates at LOS E or better during the AM and PM peak hours with dual left turn lanes, four through lanes, and one right turn lane at the north and south approaches and dual left turn lanes, two through lanes, and one free right turn lane at the east and west approaches.

Four through lanes at the north and south Pyramid Highway approaches is consistent with the roadway capacity results that require an eight-lane high access control arterial for all 2035 scenarios. However, as previously discussed, the Pyramid Highway/US-395 Connection Project indicates that a six-lane "high speed" high access control arterial is the preferred alternative for the Pyramid Highway/US-395 Connector north and south of Sparks Boulevard. The Pyramid Highway/US-395 Connection Project and RTC's 2040 Regional Transportation Plan also indicate that a grade-separated interchange is planned for construction at the Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection in the 2027-2040 timeframe. The Pyramid Highway/ Highland Ranch Parkway/Sparks Boulevard intersection therefore re-analyzed for capacity as two separate signalized ramp intersections. The northbound and southbound ramp intersections operate at LOS C or better during the AM and PM peak hours for the 2035 base, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios. The northbound ramp intersection was analyzed with dual left turn lanes and two through lanes at the west approach, two through lanes and one right turn lane the east approach, and dual left turn lanes and one right turn lane at the south approach. The southbound ramp intersection was analyzed with dual left turn lanes and two through lanes at the east approach, two through lanes and one right turn lane the west approach, and dual left turn lanes and one right turn lane at the north approach.

Storage and deceleration requirements were reviewed for the needed dual left turn lanes at the west and south approaches based on the existing plus project plus Kiley Ranch traffic volumes. 325 feet of storage length is required for each left turn lane at the west approach and 375 feet is required for each left turn lane at the south approach based on the Poisson method for signalized intersections with a 95th percentile confidence level and 130 second cycle length. For desirable conditions 220 feet of deceleration length is needed for the left turn pocket at the west approach based on the 45 mile per hour speed limit on Highland Ranch Parkway and 365 feet of deceleration length is needed for the left turn pocket at the south approach based on the 55 mile per hour speed limit on Pyramid Highway.

It is recommended that the Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection be improved to include dual left turn lanes, two through lanes, and one right turn lane at the east and west approaches and dual left turn lanes at the south approach in order to serve project buildout traffic volumes. The dual left turn pocket at the west approach should contain 545 feet of storage/deceleration length and the dual left turn pocket at the south approach should contain 740 feet of storage/deceleration length.

Highland Ranch Parkway/Project Access Intersection

The Highland Ranch Parkway/Project Access intersection was analyzed as a signalized three-leg intersection for the existing plus project, existing plus project plus Kiley Ranch, 2035 base plus project, and 2035 base plus project plus Kiley Ranch scenarios. The intersection meets traffic signal warrant 3 per the latest edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). For the existing plus project traffic volumes the intersection operates at LOS C during the AM peak hour and LOS B during the AM Peak hour. For the existing plus project plus Kiley Ranch traffic volumes the intersection continues to operate at LOS C during the AM peak hour and LOS B during the AM peak hour with slight increases in delay.

For the 2035 base plus project traffic volumes the intersection operates at LOS B during the AM and PM peak hours. For the 2035 base plus project plus Kiley Ranch traffic volumes the intersection continues to operate at LOS B during the AM and PM peak hours. The intersection was analyzed with one left turn lane and one through lane at the west approach, one through lane and one right turn lane at the east approach, and dual left turn lanes and one right turn lane at the north approach for all scenarios.

Traffic signal spacing requirements were reviewed for the Highland Ranch Parkway/Project Access intersection. RTC's access management standards indicate that traffic signals on arterials with moderate access control (Highland Ranch Parkway) shall be spaced a minimum of 1,590 feet apart. The centerline spacing on Highland Ranch Parkway between Pyramid Highway and the Project Access is ±1,500 which very nearly meets the signal spacing standard.

Storage and deceleration requirements were reviewed for the needed left turn lanes at the west and north approaches. Approximately 150 feet of storage length is required for the left turn lane at the west approach and 250 feet is required for each left turn lane at the north approach based on the Poisson method for signalized intersections with a 95th percentile confidence level and 90 second cycle length. For desirable conditions 220 feet of deceleration length is needed for the left turn pocket at the west approach based on the 45 mile per hour speed limit on Highland Ranch Parkway and 115 feet of deceleration length is needed for the left turn pocket at the north approach based on an assumed speed limit of 35 miles per hour.

It is recommended that the Highland Ranch Parkway/Project Access intersection be improved as three-leg traffic signal controlled intersection with one left turn lane and one through lane at the west approach, one through lane and one right turn lane at the east approach, and dual left turn lanes and one right turn lane at the north approach. The left turn pocket at the west approach should contain 370 feet of storage/deceleration length and the dual left turn pocket at the north approach should contain 365 feet of storage/deceleration length.

Highland Ranch Parkway/Frontage Road Intersection

The Highland Ranch Parkway/Frontage Road intersection was analyzed as an unsignalized three-leg intersection with stop sign control at the north approach for the existing plus project plus Kiley Ranch and 2035 base plus project plus Kiley Ranch scenarios. For the existing plus project plus Kiley Ranch traffic volumes the southbound left turn movement operates at LOS F during the AM and PM peak hours. For the 2035 base plus project plus Kiley Ranch traffic volumes the southbound left turn movement continues to operate at LOS F during the AM and PM peak hours. The intersection was analyzed with one left turn lane and two through lane at the west approach, two through lanes and one right turn lane at the east approach, and one left turn lane and one right turn lane at the north approach for all scenarios. Traffic signal warrant and signal spacing requirements were subsequently reviewed at the intersection. Peak hour traffic signal warrant 3 per the latest edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) is met at the intersection for the existing plus project plus Kiley Ranch traffic volumes. However, the intersection does not meet RTC's 1,590 feet signal spacing requirement. The left turn movements at the intersection may ultimately need to be restricted.

RECOMMENDATIONS

Traffic generated by The Quarry will have some impact the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping or traffic control improvements comply with City of Sparks and Nevada Department of Transportation requirements.

It is recommended that Highland Ranch Parkway be widened to four lanes from Pyramid Highway to the Project Access.

It is recommended that the Pyramid Highway/Highland Ranch Parkway/Sparks Boulevard intersection be improved to include dual left turn lanes, two through lanes, and one right turn lane at the east and west approaches and dual left turn lanes at the south approach. The dual left turn pocket at the west approach should contain 545 feet of storage/deceleration length and the dual left turn pocket at the south approach should contain 740 feet of storage/deceleration length.

It is recommended that the Highland Ranch Parkway/Project Access intersection be improved as three-leg traffic signal controlled intersection with one left turn lane and one through lane at the west approach, one through lane and one right turn lane at the east approach, and dual left turn lanes and one right turn lane at the north approach. The left turn pocket at the west approach should contain 370 feet of storage/deceleration length and the dual left turn pocket at the north approach should contain 365 feet of storage/deceleration length.

APPENDIX

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/13/2017
Analysis Date: 9/13/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
210	SFHOUSE 1	5257	5256	10513	217	649	866	630	370	1000
	1223 Dwelling Units									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/14/2017
Analysis Date: 9/14/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
151	MWAREHOUSE 1	231	230	461	15	19	34	23	23	46
	13 Acres									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 2014, TRAFFICWARE, LLC

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
853	CONVMARKETGAS 1	3383	3382	6765	164	163	327	204	203	407
	8 Gross Floor Area 1000 SF									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	103	103	206	135	134	269
Volume Added to Adjacent Streets		0	0	0	-103	-103	-206	-135	-134	-269

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
934	FASTFOODDT 1	2605	2604	5209	243	234	477	178	165	343
	10.5 Gross Floor Area 1000 SF									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	119	115	234	89	82	171
Volume Added to Adjacent Streets		0	0	0	-119	-115	-234	-89	-82	-171

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
932	RESTAURANTHT 1	636	636	1272	59	49	108	59	40	99
	10 Gross Floor Area 1000 SF									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
820	CENTERSHOPPING 1	641	640	1281	18	11	29	53	58	111
	30 Gross Leasable Area 1000 SF									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
843	SALESAUTOPARTS 1	248	247	495	9	9	18	24	24	48
	8 Gross Floor Area 1000 SF									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
848	STORETIRE 1	100	99	199	14	9	23	14	19	33
	8 Gross Floor Area 1000 SF									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
947	CARWASH 1	216	216	432				11	11	22
	4 Wash Stalls									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 9/19/2017
Analysis Date: 9/19/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
151	MWAREHOUSE 1	142	141	283	9	12	21	15	14	29
	8 Acres									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

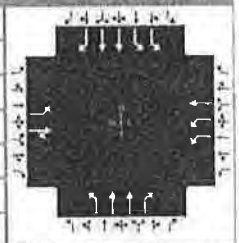
Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17ax.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	221	193	94	23	149		108	514	18	470	1284	426

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	14.0	3.0	50.0	5.0	11.0	17.0						
Yellow	4.0	0.0	4.0	4.0	0.0	4.0						
Red	1.0	0.0	1.0	1.0	0.0	1.0						

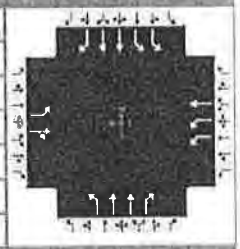
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	21.0	33.0	10.0	22.0	19.0	55.0	22.0	58.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	17.4	19.6	2.8	11.8	9.5		19.0	
Green Extension Time (g_e), s	0.2	0.6	0.0	0.5	0.1	0.0	0.4	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.66	0.03	1.00	0.23	0.12		0.94	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	240	285		25	162		117	559	20	511	1396	354
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1773		1730	1870		1781	1781	1556	1730	1781	1538
Queue Service Time (g_s), s	15.4	17.6		0.8	9.8		7.5	13.0	0.9	17.0	43.2	20.1
Cycle Queue Clearance Time (g_c), s	15.4	17.6		0.8	9.8		7.5	13.0	0.9	17.0	43.2	20.1
Green Ratio (*g/C*)	0.18	0.23		0.04	0.14		0.12	0.42	0.42	0.18	0.44	0.44
Capacity (*c*), veh/h	312	414		144	265		208	1484	648	634	1573	679
Volume-to-Capacity Ratio (*X*)	0.771	0.688		0.173	0.611		0.565	0.377	0.030	0.806	0.887	0.522
Back of Queue (*Q*), ft/ln (95 th percentile)	309.5	323.2		16.5	208.3		151.8	229.3	14.7	306.6	647.7	296.7
Back of Queue (*Q*), veh/ln (95 th percentile)	12.2	12.7		0.7	8.2		6.0	9.0	0.6	12.1	25.5	11.7
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	47.2	42.0		55.5	48.4		50.1	24.2	20.7	47.0	30.8	24.3
Incremental Delay (d_2), s/veh	10.2	4.0		0.2	3.0		2.2	0.7	0.1	7.0	7.8	2.9
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	57.4	46.0		55.7	51.4		52.3	24.9	20.8	53.9	38.6	27.2
Level of Service (LOS)	E	D		E	D		D	C	C	D	D	C
Approach Delay, s/veh / LOS	51.2	D		52.0	D		29.5	C		40.3	D	
Intersection Delay, s/veh / LOS	40.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.2	C	2.9	C	2.3	B
Bicycle LOS Score / LOS	1.4	A	0.7	A	1.1	A	2.4	B

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17px.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	325	247	116	32	256		205	1325	20	252	667	168

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	12.0	10.0	47.0	6.0	15.0	20.0	1	2	3	4		
Yellow	4.0	0.0	4.0	4.0	0.0	4.0	5	6	7	8		
Red	1.0	0.0	1.0	1.0	0.0	1.0						

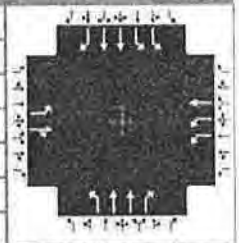
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	26.0	40.0	11.0	25.0	27.0	62.0	17.0	52.0
Change Period, (*Y+R c*), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.0	3.0	3.0	2.9	0.0	2.9	0.0
Queue Clearance Time (*g s*), s	27.7	26.8	3.3	21.2	16.7		12.1	
Green Extension Time (*g e*), s	0.0	0.9	0.0	0.0	0.3	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	0.07	1.00	1.00	0.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	353	367		35	278		223	1440	22	274	725	139
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1772		1730	1870		1781	1781	1557	1730	1781	1535
Queue Service Time (*g s*), s	25.7	24.8		1.3	19.2		14.7	49.6	1.0	10.1	21.2	8.3
Cycle Queue Clearance Time (*g c*), s	25.7	24.8		1.3	19.2		14.7	49.6	1.0	10.1	21.2	8.3
Green Ratio (*g/C*)	0.20	0.27		0.05	0.15		0.21	0.44	0.44	0.09	0.36	0.36
Capacity (*c*), veh/h	356	477		160	288		370	1561	683	319	1287	555
Volume-to-Capacity Ratio (*X*)	0.992	0.770		0.218	0.967		0.602	0.922	0.032	0.858	0.563	0.251
Back of Queue (Q), ft/ln (95 th percentile)	567.9	439.5		25.1	458.9		269.9	752	17.2	224.7	352.9	140.9
Back of Queue (Q), veh/ln (95 th percentile)	22.4	17.3		1.0	18.1		10.6	29.6	0.7	8.8	13.9	5.5
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (*d 1*), s/veh	51.9	43.8		59.7	54.7		46.6	34.4	20.8	58.2	33.3	29.1
Incremental Delay (*d 2*), s/veh	45.3	6.8		0.3	43.7		2.0	10.5	0.1	19.3	1.8	1.1
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	97.1	50.6		60.0	98.4		48.6	44.9	20.9	77.5	35.1	30.2
Level of Service (LOS)	F	D		E	F		D	D	C	E	D	C
Approach Delay, s/veh / LOS	73.4	E		94.1	F		45.1	D		44.7	D	
Intersection Delay, s/veh / LOS	54.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	3.4	C	2.3	B
Bicycle LOS Score / LOS	1.7	B	0.3	A	1.9	B	1.4	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	321	360	395	23	207		212	514	18	470	1284	461

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	14.0	3.0	50.0	5.0	11.0	17.0	
Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
Red	1.0	0.0	1.0	1.0	0.0	1.0	

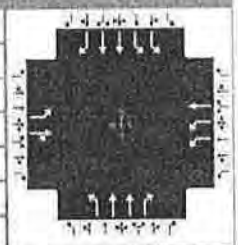
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	21.0	33.0	10.0	22.0	19.0	55.0	22.0	58.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.2	3.0	3.2	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	23.0	30.0	2.8	16.1	16.0		19.0	
Green Extension Time (g_e), s	0.0	0.0	0.0	0.3	0.0	0.0	0.4	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		0.94	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	349	793		25	225		230	559	20	511	1396	392
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1692		1730	1870		1781	1781	1556	1730	1781	1538
Queue Service Time (g_s), s	21.0	28.0		0.8	14.1		14.0	13.0	0.9	17.0	43.2	22.9
Cycle Queue Clearance Time (g_c), s	21.0	28.0		0.8	14.1		14.0	13.0	0.9	17.0	43.2	22.9
Green Ratio (*g/C*)	0.18	0.23		0.04	0.14		0.12	0.42	0.42	0.18	0.44	0.44
Capacity (*c*), veh/h	312	395		144	265		208	1484	648	634	1573	679
Volume-to-Capacity Ratio (*X*)	1.119	2.010		0.173	0.849		1.109	0.377	0.030	0.806	0.887	0.578
Back of Queue (*Q*), ft/ln (95 th percentile)	630.4	2486.8		16.5	319.4		450.5	229.3	14.7	306.6	647.7	333
Back of Queue (*Q*), veh/ln (95 th percentile)	24.8	97.9		0.7	12.6		17.7	9.0	0.6	12.1	25.5	13.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	49.5	46.0		55.5	50.2		53.0	24.2	20.7	47.0	30.8	25.1
Incremental Delay (d_2), s/veh	87.1	463.2		0.2	21.1		94.6	0.7	0.1	7.0	7.8	3.6
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	136.6	509.2		55.7	71.3		147.6	24.9	20.8	53.9	38.6	28.7
Level of Service (LOS)	F	F		E	E		F	C	C	D	D	C
Approach Delay, s/veh / LOS	395.4	F		69.8	E		59.8	E		40.3	D	
Intersection Delay, s/veh / LOS	135.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.2	C	2.9	C	2.3	B
Bicycle LOS Score / LOS	2.4	B	0.8	A	1.2	A	2.4	B

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	384	345	293	32	419		499	1325	20	252	667	266

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	12.0	10.0	47.0	6.0	15.0	20.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0			
				Red	1.0	0.0	1.0	1.0	0.0	1.0			

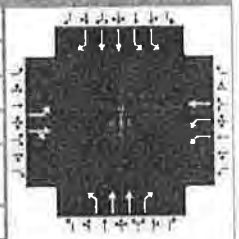
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	26.0	40.0	11.0	25.0	27.0	62.0	17.0	52.0
Change Period, (Y+R c), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g s), s	28.0	37.0	3.3	22.0	29.0		12.1	
Green Extension Time (g e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	417	666		35	455		542	1440	22	274	725	246
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1716		1730	1870		1781	1781	1557	1730	1781	1535
Queue Service Time (g s), s	26.0	35.0		1.3	20.0		27.0	49.6	1.0	10.1	21.2	15.8
Cycle Queue Clearance Time (g c), s	26.0	35.0		1.3	20.0		27.0	49.6	1.0	10.1	21.2	15.8
Green Ratio (g/C)	0.20	0.27		0.05	0.15		0.21	0.44	0.44	0.09	0.36	0.36
Capacity (c), veh/h	356	462		160	288		370	1561	683	319	1287	555
Volume-to-Capacity Ratio (X)	1.172	1.442		0.218	1.583		1.466	0.922	0.032	0.858	0.563	0.443
Back of Queue (Q), ft/ln (95 th percentile)	808.1	1603.7		25.1	1231.3		1335.2	752	17.2	224.7	352.9	253.1
Back of Queue (Q), veh/ln (95 th percentile)	31.8	63.1		1.0	48.5		52.6	29.6	0.7	8.8	13.9	10.0
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	52.0	47.5		59.7	55.0		51.5	34.4	20.8	58.2	33.3	31.5
Incremental Delay (d 2), s/veh	103.1	211.0		0.3	278.3		224.1	10.5	0.1	19.3	1.8	2.6
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	155.1	258.5		60.0	333.3		275.6	44.9	20.9	77.5	35.1	34.1
Level of Service (LOS)	F	F		E	F		F	D	C	E	D	C
Approach Delay, s/veh / LOS	218.7	F		313.9	F		107.1	F		44.2	D	
Intersection Delay, s/veh / LOS	137.0						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	3.4	C	2.3	B
Bicycle LOS Score / LOS	2.3	B	0.6	A	2.1	B	1.5	B

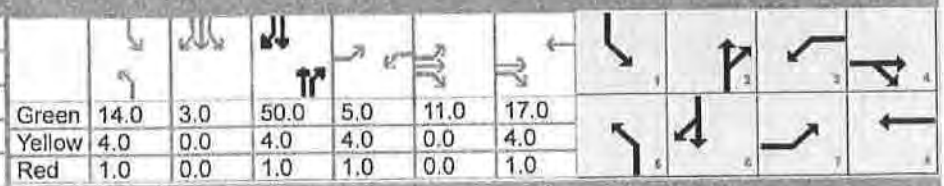
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Ex. + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17awo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	397	370	412	23	236		289	511	18	500	1334	461

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	14.0	3.0	50.0	5.0	11.0	17.0	
Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
Red	1.0	0.0	1.0	1.0	0.0	1.0	

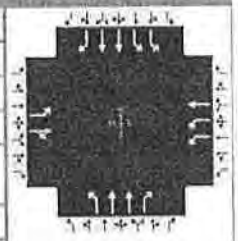
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	21.0	33.0	10.0	22.0	19.0	55.0	22.0	58.0
Change Period, (Y+R c), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (MAH), s	3.1	3.2	3.0	3.2	2.9	0.0	2.9	0.0
Queue Clearance Time (g s), s	23.0	30.0	2.8	18.4	16.0		20.3	
Green Extension Time (g e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	432	823		25	257		314	555	20	543	1450	392
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1691		1730	1870		1781	1781	1556	1730	1781	1538
Queue Service Time (g s), s	21.0	28.0		0.8	16.4		14.0	12.9	0.9	18.3	46.0	22.9
Cycle Queue Clearance Time (g c), s	21.0	28.0		0.8	16.4		14.0	12.9	0.9	18.3	46.0	22.9
Green Ratio (g/C)	0.18	0.23		0.04	0.14		0.12	0.42	0.42	0.18	0.44	0.44
Capacity (c), veh/h	312	395		144	265		208	1484	648	634	1573	679
Volume-to-Capacity Ratio (X)	1.384	2.086		0.173	0.968		1.512	0.374	0.030	0.857	0.922	0.578
Back of Queue (Q), ft/ln (95 th percentile)	1000.9	2636.4		16.5	412.5		824.2	227.7	14.7	334.9	697.9	333
Back of Queue (Q), veh/ln (95 th percentile)	39.4	103.8		0.7	16.2		32.4	9.0	0.6	13.2	27.5	13.1
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	49.5	46.0		55.5	51.2		53.0	24.2	20.7	47.5	31.6	25.1
Incremental Delay (d 2), s/veh	191.7	497.2		0.2	46.1		253.5	0.7	0.1	10.7	10.4	3.6
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	241.2	543.2		55.7	97.3		306.5	24.9	20.8	58.2	42.0	28.7
Level of Service (LOS)	F	F		E	F		F	C	C	E	D	C
Approach Delay, s/veh / LOS	439.3	F		93.6	F		124.3	F		43.5	D	
Intersection Delay, s/veh / LOS	164.5						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.2	C	2.9	C	2.3	B
Bicycle LOS Score / LOS	2.6	C	0.9	A	1.2	A	2.5	B

HCS7 Signalized Intersection Results Summary

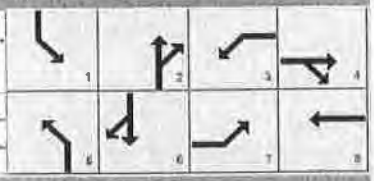
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Ex. + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp17pwo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	508	355	310	32	449		623	1275	20	283	718	266

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	12.0	10.0	47.0	6.0	15.0	20.0		
Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
Red	1.0	0.0	1.0	1.0	0.0	1.0		



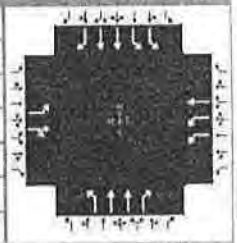
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	26.0	40.0	11.0	25.0	27.0	62.0	17.0	52.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	28.0	37.0	3.3	22.0	29.0		13.5	
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	552	696		35	488		677	1386	22	308	780	246
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1713		1730	1870		1781	1781	1557	1730	1781	1535
Queue Service Time (g_s), s	26.0	35.0		1.3	20.0		27.0	46.5	1.0	11.5	23.3	15.8
Cycle Queue Clearance Time (g_c), s	26.0	35.0		1.3	20.0		27.0	46.5	1.0	11.5	23.3	15.8
Green Ratio (*g/C*)	0.20	0.27		0.05	0.15		0.21	0.44	0.44	0.09	0.36	0.36
Capacity (*c*), veh/h	356	461		160	288		370	1561	683	319	1287	555
Volume-to-Capacity Ratio (*X*)	1.550	1.508		0.218	1.696		1.830	0.888	0.032	0.963	0.606	0.443
Back of Queue (*Q*), ft/ln (95 th percentile)	1453.1	1756.2		25.1	1392		2013.6	698.7	17.2	276	382.1	253.1
Back of Queue (*Q*), veh/ln (95 th percentile)	57.2	69.1		1.0	54.8		79.3	27.5	0.7	10.9	15.0	10.0
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	52.0	47.5		59.7	55.0		51.5	33.6	20.8	58.8	33.9	31.5
Incremental Delay (d_2), s/veh	261.0	239.7		0.3	327.8		384.1	7.9	0.1	40.2	2.1	2.6
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	313.0	287.2		60.0	382.8		435.6	41.4	20.9	99.0	36.1	34.1
Level of Service (LOS)	F	F		E	F		F	D	C	F	D	C
Approach Delay, s/veh / LOS	298.6	F		361.3	F		169.3	F		50.2	D	
Intersection Delay, s/veh / LOS	189.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	3.4	C	2.3	B
Bicycle LOS Score / LOS	2.5	C	0.6	A	2.2	B	1.6	B

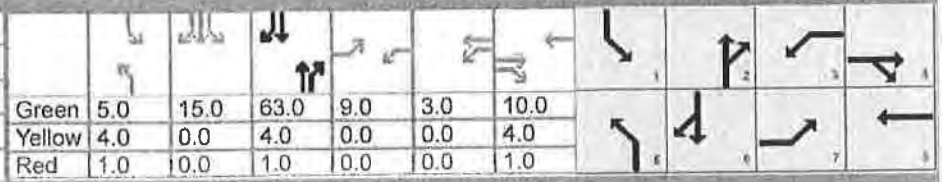
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp35ax.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	100	200	100	250	150		100	1350	100	600	3400	100

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.0	15.0		63.0	9.0	3.0	10.0					
Yellow	4.0	0.0		4.0	0.0	0.0	4.0					
Red	1.0	0.0		1.0	0.0	0.0	1.0					

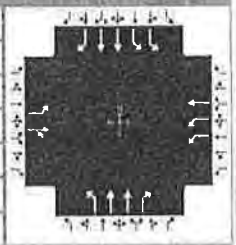
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	9.0	15.0	12.0	18.0	10.0	68.0	25.0	83.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	9.0	12.0	9.0	11.9	7.0		23.2	
Green Extension Time (g_e), s	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	105	289		263	158		105	1421	105	632	3579	79
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1759		1730	1870		1781	1781	1558	1730	1781	1543
Queue Service Time (g_s), s	7.0	10.0		7.0	9.9		5.0	37.8	4.1	21.2	78.0	2.3
Cycle Queue Clearance Time (g_c), s	7.0	10.0		7.0	9.9		5.0	37.8	4.1	21.2	78.0	2.3
Green Ratio (*g/C*)	0.08	0.08		0.06	0.11		0.04	0.52	0.52	0.21	0.65	0.65
Capacity (*c*), veh/h	134	147		202	203		74	1870	818	721	2315	1003
Volume-to-Capacity Ratio (*X*)	0.788	1.975		1.304	0.779		1.418	0.760	0.129	0.876	1.546	0.079
Back of Queue (*Q*), ft/ln (95 th percentile)	183	940.6		334.3	234.4		323.5	534.5	64.3	378.9	4134.4	31
Back of Queue (*Q*), veh/ln (95 th percentile)	7.2	37.0		13.2	9.2		12.7	21.0	2.5	14.9	162.8	1.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	54.6	55.0		56.5	52.1		57.5	22.5	14.5	46.0	21.0	7.7
Incremental Delay (d_2), s/veh	24.3	462.3		168.0	16.0		250.1	3.0	0.3	11.4	247.9	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	78.9	517.3		224.5	68.1		307.6	25.5	14.8	57.4	268.9	7.9
Level of Service (LOS)	E	F		F	E		F	C	B	E	F	A
Approach Delay, s/veh / LOS	400.4	F		165.9	F		43.0	D		233.0	F	
Intersection Delay, s/veh / LOS	192.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	2.9	C	2.3	B
Bicycle LOS Score / LOS	1.1	A	1.1	A	1.8	B	4.0	D

HCS7 Signalized Intersection Results Summary

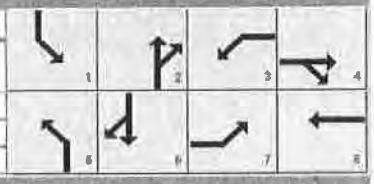
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp35px.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	200	150	100	300	200		150	3450	200	500	1700	110

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	12.0	10.0		54.0	22.0	1.0	16.0					
Yellow	4.0	0.0		4.0	0.0	0.0	4.0					
Red	1.0	0.0		1.0	0.0	0.0	1.0					



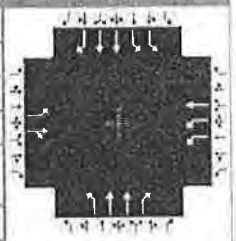
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	22.0	21.0	23.0	22.0	27.0	69.0	17.0	59.0
Change Period, (Y+R c), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g s), s	16.5	18.0	13.3	16.3	12.0		14.0	
Green Extension Time (g e), s	0.2	0.0	0.3	0.1	0.2	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.10	1.00	0.19	1.00	0.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	211	237		316	211		158	3632	211	526	1789	89
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1743		1730	1870		1781	1781	1558	1730	1781	1537
Queue Service Time (g s), s	14.5	16.0		11.3	14.3		10.0	64.0	10.3	12.0	54.0	4.7
Cycle Queue Clearance Time (g c), s	14.5	16.0		11.3	14.3		10.0	64.0	10.3	12.0	54.0	4.7
Green Ratio (g/C)	0.17	0.12		0.14	0.13		0.21	0.49	0.49	0.09	0.42	0.42
Capacity (c), veh/h	301	214		479	245		370	1753	767	319	1479	638
Volume-to-Capacity Ratio (X)	0.698	1.104		0.659	0.861		0.427	2.071	0.275	1.648	1.210	0.140
Back of Queue (Q), ft/ln (95 th percentile)	285	484.1		218.8	329.4		195.4	5829.9	168	757.9	1533.8	78
Back of Queue (Q), veh/ln (95 th percentile)	11.2	19.1		8.6	13.0		7.7	229.5	6.6	29.8	60.4	3.1
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh	50.9	57.0		53.1	55.3		44.8	33.0	19.4	59.0	38.0	23.6
Incremental Delay (d 2), s/veh	5.9	92.2		2.7	24.4		0.3	484.1	0.9	305.4	100.9	0.5
Initial Queue Delay (d 3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	56.8	149.2		55.8	79.7		45.1	517.1	20.3	364.4	138.9	24.0
Level of Service (LOS)	E	F		E	E		D	F	C	F	F	C
Approach Delay, s/veh / LOS	105.7	F		65.3	E		472.3	F		184.0	F	
Intersection Delay, s/veh / LOS	327.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	3.4	C	2.3	B
Bicycle LOS Score / LOS	1.2	A	0.7	A	3.8	D	2.5	B

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp35aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	200	367	401	250	208		204	1350	100	600	3400	135

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	6.0	15.0		55.0	6.0	4.0	14.0					
Yellow	4.0	0.0		4.0	4.0	0.0	4.0					
Red	1.0	0.0		1.0	1.0	0.0	1.0					

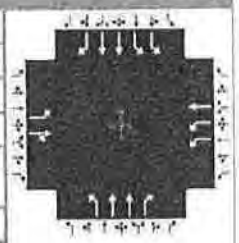
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	23.0	11.0	19.0	11.0	60.0	26.0	75.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.2	3.0	3.2	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	16.1	20.0	8.0	16.0	8.0		23.0	
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		0.96	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	211	782		263	219		215	1421	105	632	3579	116
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1687		1730	1870		1781	1781	1557	1730	1781	1542
Queue Service Time (g_s), s	14.1	18.0		6.0	14.0		6.0	43.2	4.7	21.0	70.0	4.1
Cycle Queue Clearance Time (g_c), s	14.1	18.0		6.0	14.0		6.0	43.2	4.7	21.0	70.0	4.1
Green Ratio (*g/C*)	0.12	0.15		0.05	0.12		0.05	0.46	0.46	0.22	0.58	0.58
Capacity (*c*), veh/h	223	253		173	218		89	1632	714	750	2077	899
Volume-to-Capacity Ratio (*X*)	0.945	3.091		1.521	1.003		2.411	0.871	0.147	0.843	1.723	0.129
Back of Queue (*Q*), ft/ln (95 th percentile)	353	2920.4		385.3	390.6		782.3	637.2	76.4	366.1	4786.8	59.8
Back of Queue (*Q*), veh/ln (95 th percentile)	13.9	115.0		15.2	15.4		30.8	25.1	3.0	14.4	188.5	2.4
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	52.1	51.0		57.0	53.0		57.0	29.3	18.9	45.0	25.0	11.3
Incremental Delay (d_2), s/veh	44.7	951.5		261.9	61.8		667.8	6.7	0.4	8.2	327.3	0.3
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	96.8	1002.5		318.9	114.8		724.8	36.0	19.3	53.2	352.3	11.6
Level of Service (LOS)	F	F		F	F		F	D	B	D	F	B
Approach Delay, s/veh / LOS	810.4	F		226.2	F		119.9	F		299.5	F	
Intersection Delay, s/veh / LOS	320.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	2.9	C	2.3	B
Bicycle LOS Score / LOS	2.1	B	1.2	A	1.9	B	4.1	D

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp35pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	259	248	277	300	363		444	3450	200	500	1700	208

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB							
										1	2	3	4	
Green	12.0	10.0		54.0	22.0	1.0	16.0							
Yellow	4.0	0.0		4.0	0.0	0.0	4.0							
Red	1.0	0.0		1.0	0.0	0.0	1.0							
								5	6	7	8			

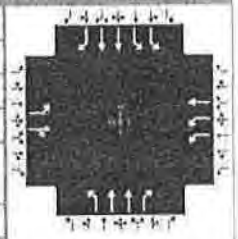
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	22.0	21.0	23.0	22.0	27.0	69.0	17.0	59.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	21.5	18.0	13.3	19.0	29.0		14.0	
Green Extension Time (g_e), s	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	0.19	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	273	526		316	382		467	3632	211	526	1789	193
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1684		1730	1870		1781	1781	1558	1730	1781	1537
Queue Service Time (g_s), s	19.5	16.0		11.3	17.0		27.0	64.0	10.3	12.0	54.0	10.9
Cycle Queue Clearance Time (g_c), s	19.5	16.0		11.3	17.0		27.0	64.0	10.3	12.0	54.0	10.9
Green Ratio (*g/C*)	0.17	0.12		0.14	0.13		0.21	0.49	0.49	0.09	0.42	0.42
Capacity (*c*), veh/h	301	207		479	245		370	1753	767	319	1479	638
Volume-to-Capacity Ratio (*X*)	0.904	2.540		0.659	1.562		1.263	2.071	0.275	1.648	1.210	0.302
Back of Queue (*Q*), ft/ln (95 th percentile)	417.7	1881		218.8	1037.4		972.1	5829.9	168	757.9	1533.8	182.1
Back of Queue (*Q*), veh/ln (95 th percentile)	16.4	74.1		8.6	40.8		38.3	229.5	6.6	29.8	60.4	7.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	53.0	57.0		53.1	56.5		51.5	33.0	19.4	59.0	38.0	25.4
Incremental Delay (d_2), s/veh	28.1	706.9		2.7	272.0		138.5	484.1	0.9	305.4	100.9	1.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	81.1	763.9		55.8	328.5		190.0	517.1	20.3	364.4	138.9	26.6
Level of Service (LOS)	F	F		E	F		F	F	C	F	F	C
Approach Delay, s/veh / LOS	530.9	F		205.1	F		457.4	F		177.6	F	
Intersection Delay, s/veh / LOS	358.9						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	3.4	C	2.3	B
Bicycle LOS Score / LOS	1.8	B	0.9	A	4.0	D	2.6	C

HCS7 Signalized Intersection Results Summary

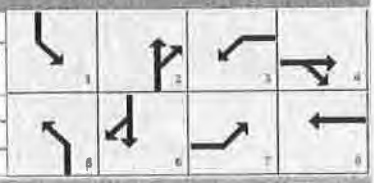
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp35awo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	276	377	418	250	237		281	1347	100	630	3450	135

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	8.0	13.0	55.0	5.0	6.0	13.0
Yellow	4.0	0.0	4.0	4.0	0.0	4.0
Red	1.0	0.0	1.0	1.0	0.0	1.0



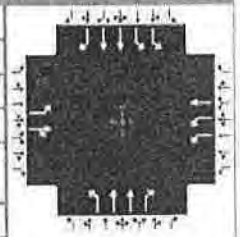
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	16.0	24.0	10.0	18.0	13.0	60.0	26.0	73.0
Change Period, (*Y+R c*), s	0.0	5.0	5.0	5.0	5.0	5.0	0.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.2	3.0	3.2	2.9	0.0	2.9	0.0
Queue Clearance Time (*g s*), s	18.0	21.0	7.0	15.0	10.0		24.3	
Green Extension Time (*g e*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	291	811		263	249		296	1418	105	663	3632	116
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1686		1730	1870		1781	1781	1557	1730	1781	1541
Queue Service Time (*g s*), s	16.0	19.0		5.0	13.0		8.0	43.0	4.7	22.3	68.0	4.2
Cycle Queue Clearance Time (*g c*), s	16.0	19.0		5.0	13.0		8.0	43.0	4.7	22.3	68.0	4.2
Green Ratio (*g/C*)	0.13	0.16		0.04	0.11		0.07	0.46	0.46	0.22	0.57	0.57
Capacity (*c*), veh/h	238	267		144	203		119	1632	714	750	2018	873
Volume-to-Capacity Ratio (*X*)	1.223	3.036		1.826	1.231		2.491	0.869	0.147	0.885	1.800	0.133
Back of Queue (Q), ft/ln (95 th percentile)	616.1	3013.1		437.6	546.8		1059.9	634.3	76.4	394.9	5086.2	63.2
Back of Queue (Q), veh/ln (95 th percentile)	24.3	118.6		17.2	21.5		41.7	25.0	3.0	15.5	200.2	2.5
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (*d 1*), s/veh	52.0	50.5		57.5	53.5		56.0	29.3	18.9	45.5	26.0	12.2
Incremental Delay (*d 2*), s/veh	132.0	926.2		397.4	139.4		695.3	6.6	0.4	11.8	361.8	0.3
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	184.0	976.7		454.9	192.9		751.3	35.8	19.3	57.4	387.8	12.5
Level of Service (LOS)	F	F		F	F		F	D	B	E	F	B
Approach Delay, s/veh / LOS	767.6	F		327.4	F		151.2	F		328.3	F	
Intersection Delay, s/veh / LOS	348.8						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	2.9	C	2.3	B
Bicycle LOS Score / LOS	2.3	B	1.2	A	2.0	B	4.1	D

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid & Sparks	File Name	PySp35pwo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	383	258	294	300	393		568	3400	200	531	1751	208

Signal Information													
Cycle, s	130.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	12.0	10.0	54.0	22.0	1.0	16.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	0.0	0.0	4.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.0	0.0	0.0	1.0			

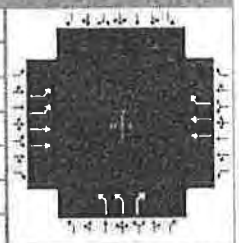
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	22.0	21.0	23.0	22.0	27.0	69.0	17.0	59.0
Change Period, ($Y+R_c$), s	0.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.0	3.1	2.9	0.0	2.9	0.0
Queue Clearance Time (g_s), s	24.0	18.0	13.3	19.0	29.0		14.0	
Green Extension Time (g_e), s	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	0.19	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	403	555		316	414		598	3579	211	559	1843	193
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1682		1730	1870		1781	1781	1558	1730	1781	1537
Queue Service Time (g_s), s	22.0	16.0		11.3	17.0		27.0	64.0	10.3	12.0	54.0	10.9
Cycle Queue Clearance Time (g_c), s	22.0	16.0		11.3	17.0		27.0	64.0	10.3	12.0	54.0	10.9
Green Ratio (g/C)	0.17	0.12		0.14	0.13		0.21	0.49	0.49	0.09	0.42	0.42
Capacity (c), veh/h	301	207		479	245		370	1753	767	319	1479	638
Volume-to-Capacity Ratio (X)	1.337	2.680		0.659	1.691		1.616	2.041	0.275	1.750	1.246	0.302
Back of Queue (Q), ft/ln (95 th percentile)	933.4	2015.8		218.8	1191.4		1613.3	5687.7	168	837.4	1666.5	182.1
Back of Queue (Q), veh/ln (95 th percentile)	36.7	79.4		8.6	46.9		63.5	223.9	6.6	33.0	65.6	7.2
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	54.0	57.0		53.1	56.5		51.5	33.0	19.4	59.0	38.0	25.4
Incremental Delay (d_2), s/veh	172.6	769.8		2.7	328.2		289.5	470.6	0.9	350.4	116.6	1.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	226.6	826.8		55.8	384.7		341.0	503.6	20.3	409.4	154.6	26.6
Level of Service (LOS)	F	F		E	F		F	F	C	F	F	C
Approach Delay, s/veh / LOS	574.2	F		242.3	F		458.3	F		199.9	F	
Intersection Delay, s/veh / LOS	375.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	3.1	C	3.4	C	2.3	B
Bicycle LOS Score / LOS	2.1	B	1.0	A	4.1	D	2.6	C

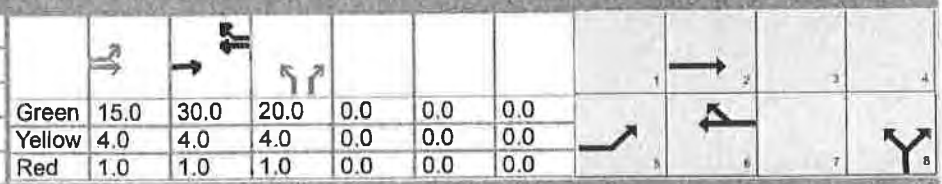
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks NB Ramp	File Name	NB35ax.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	100	800			400	300	100		100			

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	30.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

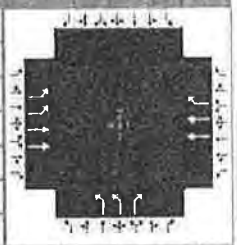
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	20.0	55.0		35.0		25.0		
Change Period, (*Y+R c*), s	5.0	5.0		5.0		5.0		
Max Allow Headway (*MAH*), s	3.1	0.0		0.0		3.2		
Queue Clearance Time (*g s*), s	4.0					6.3		
Green Extension Time (*g e*), s	0.1	0.0		0.0		0.4		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.00					0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (*v*), veh/h	105	842			421	316	105		105			
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1730	1781			1781	1585	1730		1585			
Queue Service Time (*g s*), s	2.0	9.3			6.7	12.4	1.9		4.3			
Cycle Queue Clearance Time (*g c*), s	2.0	9.3			6.7	12.4	1.9		4.3			
Green Ratio (*g/C*)	0.19	0.62			0.38	0.38	0.25		0.25			
Capacity (*c*), veh/h	649	2226			1335	594	865		396			
Volume-to-Capacity Ratio (*X*)	0.162	0.378			0.315	0.531	0.122		0.266			
Back of Queue (*Q*), ft/ln (95 th percentile)	37.2	138.5			122.9	213.3	33.7		70.4			
Back of Queue (*Q*), veh/ln (95 th percentile)	1.5	5.5			4.8	8.4	1.3		2.8			
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00	0.00		0.00			
Uniform Delay (*d 1*), s/veh	27.2	7.4			17.7	19.5	23.2		24.1			
Incremental Delay (*d 2*), s/veh	0.0	0.5			0.6	3.4	0.0		0.1			
Initial Queue Delay (*d 3*), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (*d*), s/veh	27.3	7.9			18.3	22.9	23.2		24.2			
Level of Service (LOS)	C	A			B	C	C		C			
Approach Delay, s/veh / LOS	10.0	B		20.3	C		23.7	C		0.0		
Intersection Delay, s/veh / LOS	15.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	B	2.4	B	2.9	C	3.0	C
Bicycle LOS Score / LOS	1.3	A	1.1	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks NB Ramp	File Name	NB35px.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	200	650			500	600	150		200			

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	30.0	20.0	0.0	0.0	0.0	1	2	3	4
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	5	6	7	8
Red	1.0	1.0	1.0	0.0	0.0	0.0				

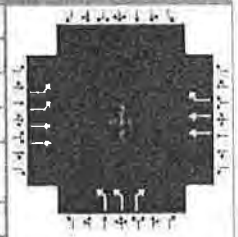
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	20.0	55.0		35.0		25.0		
Change Period, (Y+R c), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.1	0.0		0.0		3.3		
Queue Clearance Time (g s), s	6.2					11.2		
Green Extension Time (g e), s	0.3	0.0		0.0		0.6		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.00					0.02		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	211	684			526	500	158		211			
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781			1781	1585	1730		1585			
Queue Service Time (g s), s	4.2	7.1			8.7	23.0	2.9		9.2			
Cycle Queue Clearance Time (g c), s	4.2	7.1			8.7	23.0	2.9		9.2			
Green Ratio (g/C)	0.19	0.62			0.38	0.38	0.25		0.25			
Capacity (c), veh/h	649	2226			1335	594	865		396			
Volume-to-Capacity Ratio (X)	0.325	0.307			0.394	0.841	0.183		0.531			
Back of Queue (Q), ft/ln (95 th percentile)	76.9	105.9			159.5	388.6	51.4		153.8			
Back of Queue (Q), veh/ln (95 th percentile)	3.0	4.2			6.3	15.3	2.0		6.1			
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00	0.00		0.00			
Uniform Delay (d 1), s/veh	28.1	7.0			18.3	22.8	23.6		25.9			
Incremental Delay (d 2), s/veh	0.1	0.4			0.9	13.5	0.0		0.7			
Initial Queue Delay (d 3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	28.2	7.3			19.2	36.3	23.6		26.7			
Level of Service (LOS)	C	A			B	D	C		C			
Approach Delay, s/veh / LOS	12.2	B		27.5	C		25.4	C		0.0		
Intersection Delay, s/veh / LOS	21.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	B	2.4	B	3.0	C	3.0	C
Bicycle LOS Score / LOS	1.2	A	1.3	A		F		

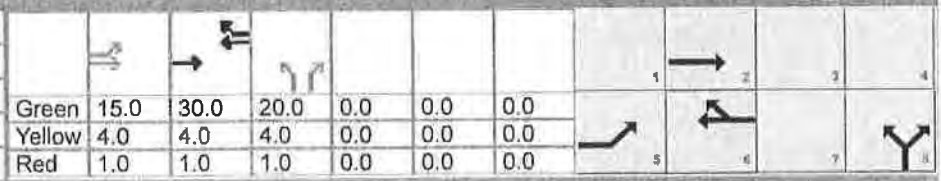
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks NB Ramp	File Name	NB35aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	200	967			458	300	204		100			

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	30.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

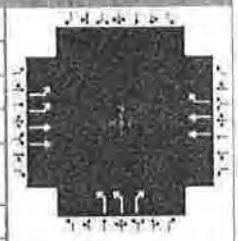
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	20.0	55.0		35.0		25.0		
Change Period, ($Y+R_c$), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.1	0.0		0.0		3.2		
Queue Clearance Time (g_s), s	6.2					6.3		
Green Extension Time (g_e), s	0.3	0.0		0.0		0.6		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.00					0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	211	1018			482	316	215		105			
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781			1781	1585	1730		1585			
Queue Service Time (g_s), s	4.2	12.0			7.8	12.4	4.0		4.3			
Cycle Queue Clearance Time (g_c), s	4.2	12.0			7.8	12.4	4.0		4.3			
Green Ratio (g/C)	0.19	0.62			0.38	0.38	0.25		0.25			
Capacity (c), veh/h	649	2226			1335	594	865		396			
Volume-to-Capacity Ratio (X)	0.325	0.457			0.361	0.531	0.248		0.266			
Back of Queue (Q), ft/ln (95 th percentile)	76.9	179.6			143.6	213.3	71.2		70.4			
Back of Queue (Q), veh/ln (95 th percentile)	3.0	7.1			5.7	8.4	2.8		2.8			
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00	0.00		0.00			
Uniform Delay (d_1), s/veh	28.1	7.9			18.1	19.5	24.0		24.1			
Incremental Delay (d_2), s/veh	0.1	0.7			0.8	3.4	0.1		0.1			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	28.2	8.6			18.8	22.9	24.0		24.2			
Level of Service (LOS)	C	A			B	C	C		C			
Approach Delay, s/veh / LOS	11.9	B		20.4	C		24.1	C		0.0		
Intersection Delay, s/veh / LOS	16.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	B	2.4	B	2.9	C	3.0	C
Bicycle LOS Score / LOS	1.5	B	1.1	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks NB Ramp	File Name	NB35pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	259	748			663	600	444		200			

Signal Information													
Cycle, s	80.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	15.0	30.0	20.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	0.0	0.0			

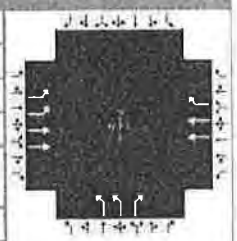
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	20.0	55.0		35.0		25.0		
Change Period, (Y+R c), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.1	0.0		0.0		3.2		
Queue Clearance Time (g s), s	7.6					11.4		
Green Extension Time (g e), s	0.4	0.0		0.0		1.2		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.01					0.06		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	273	787			698	500	467		211			
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781			1781	1585	1730		1585			
Queue Service Time (g s), s	5.6	8.5			12.2	23.0	9.4		9.2			
Cycle Queue Clearance Time (g c), s	5.6	8.5			12.2	23.0	9.4		9.2			
Green Ratio (g/C)	0.19	0.62			0.38	0.38	0.25		0.25			
Capacity (c), veh/h	649	2226			1335	594	865		396			
Volume-to-Capacity Ratio (X)	0.420	0.354			0.523	0.841	0.540		0.531			
Back of Queue (Q), ft/ln (95 th percentile)	101.8	126.7			218.2	388.6	169.5		153.8			
Back of Queue (Q), veh/ln (95 th percentile)	4.0	5.0			8.6	15.3	6.7		6.1			
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00	0.00		0.00			
Uniform Delay (d 1), s/veh	28.7	7.2			19.4	22.8	26.0		25.9			
Incremental Delay (d 2), s/veh	0.2	0.4			1.5	13.5	0.4		0.7			
Initial Queue Delay (d 3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	28.8	7.7			20.9	36.3	26.4		26.7			
Level of Service (LOS)	C	A			C	D	C		C			
Approach Delay, s/veh / LOS	13.1	B		27.3	C		26.5	C		0.0		
Intersection Delay, s/veh / LOS	22.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	B	2.4	B	3.0	C	3.0	C
Bicycle LOS Score / LOS	1.4	A	1.5	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks NB Ramp	File Name	NB35aww.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	276	1007			487	315	281		100			

Signal Information													
Cycle, s	80.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	15.0	30.0	20.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	0.0	0.0			

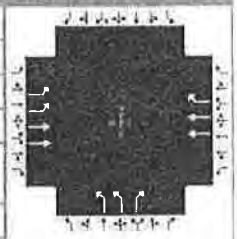
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	20.0	55.0		35.0		25.0		
Change Period, ($Y+R_c$), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.1	0.0		0.0		3.2		
Queue Clearance Time (g_s), s	8.0					7.6		
Green Extension Time (g_e), s	0.4	0.0		0.0		0.8		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.02					0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	291	1060			513	332	296		105			
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781			1781	1585	1730		1585			
Queue Service Time (g_s), s	6.0	12.7			8.4	13.2	5.6		4.3			
Cycle Queue Clearance Time (g_c), s	6.0	12.7			8.4	13.2	5.6		4.3			
Green Ratio (g/C)	0.19	0.62			0.38	0.38	0.25		0.25			
Capacity (c), veh/h	649	2226			1335	594	865		396			
Volume-to-Capacity Ratio (X)	0.448	0.476			0.384	0.558	0.342		0.266			
Back of Queue (Q), ft/ln (95 th percentile)	109	190.1			154.6	224.7	100.6		70.4			
Back of Queue (Q), veh/ln (95 th percentile)	4.3	7.5			6.1	8.8	4.0		2.8			
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00	0.00		0.00			
Uniform Delay (d_1), s/veh	28.8	8.0			18.3	19.8	24.6		24.1			
Incremental Delay (d_2), s/veh	0.2	0.7			0.8	3.7	0.1		0.1			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	29.0	8.7			19.1	23.5	24.7		24.2			
Level of Service (LOS)	C	A			B	C	C		C			
Approach Delay, s/veh / LOS	13.1	B		20.8	C		24.6	C		0.0		
Intersection Delay, s/veh / LOS	17.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	B	2.4	B	2.9	C	3.0	C
Bicycle LOS Score / LOS	1.6	B	1.2	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks NB Ramp	File Name	NB35pww.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	383	789			693	615	568		200			

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

								1	2	3	4	
Green	15.0	30.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	5	6	7	8		
Red	1.0	1.0	1.0	0.0	0.0	0.0						

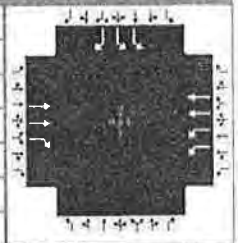
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	2.0	4.0		7.3		9.0		
Phase Duration, s	20.0	55.0		35.0		25.0		
Change Period, (Y+R c), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.1	0.0		0.0		3.2		
Queue Clearance Time (g s), s	10.6					14.5		
Green Extension Time (g e), s	0.5	0.0		0.0		1.2		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.36					0.37		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	403	831			729	516	598		211			
Adjusted Saturation Flow Rate (s), veh/h/ln	1730	1781			1781	1585	1730		1585			
Queue Service Time (g s), s	8.6	9.1			12.9	24.1	12.5		9.2			
Cycle Queue Clearance Time (g c), s	8.6	9.1			12.9	24.1	12.5		9.2			
Green Ratio (g/C)	0.19	0.62			0.38	0.38	0.25		0.25			
Capacity (c), veh/h	649	2226			1335	594	865		396			
Volume-to-Capacity Ratio (X)	0.622	0.373			0.546	0.868	0.691		0.531			
Back of Queue (Q), ft/ln (95 th percentile)	161.3	136			228.2	412.3	224.6		153.8			
Back of Queue (Q), veh/ln (95 th percentile)	6.4	5.4			9.0	16.2	8.8		6.1			
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00	0.00		0.00			
Uniform Delay (d 1), s/veh	29.9	7.3			19.7	23.2	27.2		25.9			
Incremental Delay (d 2), s/veh	1.4	0.5			1.6	15.7	2.0		0.7			
Initial Queue Delay (d 3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	31.3	7.8			21.3	38.9	29.2		26.7			
Level of Service (LOS)	C	A			C	D	C		C			
Approach Delay, s/veh / LOS	15.5	B		28.6	C		28.5	C		0.0		
Intersection Delay, s/veh / LOS	23.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.9	B	2.4	B	3.0	C	3.0	C
Bicycle LOS Score / LOS	1.5	B	1.5	B		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks SB Ramp	File Name	SB35ax.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		300	100	250	250					600		100

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	30.0	20.0	0.0	0.0	0.0	1	2	3	4		
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	5	6	7	8		
Red	1.0	1.0	1.0	0.0	0.0	0.0						

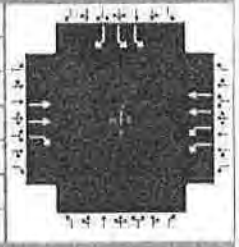
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	20.0	55.0				25.0
Change Period, (*Y+R c*), s		5.0	5.0	5.0				5.0
Max Allow Headway (*MAH*), s		0.0	3.1	0.0				3.2
Queue Clearance Time (*g s*), s			7.4					15.4
Green Extension Time (*g e*), s		0.0	0.4	0.0				1.0
Phase Call Probability			1.00					1.00
Max Out Probability			0.01					0.50

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate (*v*), veh/h		316	105	263	263					632		105
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1781	1585	1730	1781					1730		1585
Queue Service Time (*g s*), s		4.9	3.6	5.4	2.4					13.4		4.3
Cycle Queue Clearance Time (*g c*), s		4.9	3.6	5.4	2.4					13.4		4.3
Green Ratio (*g/C*)		0.38	0.38	0.19	0.62					0.25		0.25
Capacity (*c*), veh/h		1335	594	649	2226					865		396
Volume-to-Capacity Ratio (*X*)		0.236	0.177	0.406	0.118					0.730		0.266
Back of Queue (Q), ft/ln (95 th percentile)		88.8	60.4	97.9	35.5					239.5		70.4
Back of Queue (Q), veh/ln (95 th percentile)		3.5	2.4	3.9	1.4					9.4		2.8
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (*d 1*), s/veh		17.1	16.7	28.6	6.1					27.5		24.1
Incremental Delay (*d 2*), s/veh		0.4	0.7	0.2	0.1					2.8		0.1
Initial Queue Delay (*d 3*), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay (*d*), s/veh		17.6	17.4	28.7	6.2					30.3		24.2
Level of Service (LOS)		B	B	C	A					C		C
Approach Delay, s/veh / LOS	17.5	B		17.5	B		0.0			29.4	C	
Intersection Delay, s/veh / LOS	22.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	1.9	B	3.0	C	2.9	C
Bicycle LOS Score / LOS	0.8	A	0.9	A				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks SB Ramp	File Name	SB35px.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		350	100	300	350					500		110

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	20.0	20.0	0.0	0.0	0.0	
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
Red	1.0	1.0	1.0	0.0	0.0	0.0	

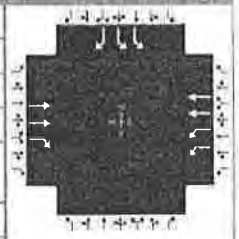
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		25.0	20.0	45.0				25.0
Change Period, (*Y+R c*), s		5.0	5.0	5.0				5.0
Max Allow Headway (*MAH*), s		0.0	3.1	0.0				3.2
Queue Clearance Time (*g s*), s			7.5					11.0
Green Extension Time (*g e*), s		0.0	0.5	0.0				1.2
Phase Call Probability			1.00					1.00
Max Out Probability			0.02					0.04

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate (*v*), veh/h		368	105	316	368					526		116
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1781	1585	1730	1781					1730		1585
Queue Service Time (*g s*), s		5.8	3.6	5.5	3.5					9.0		3.9
Cycle Queue Clearance Time (*g c*), s		5.8	3.6	5.5	3.5					9.0		3.9
Green Ratio (*g/C*)		0.29	0.29	0.21	0.57					0.29		0.29
Capacity (*c*), veh/h		1017	453	741	2035					988		453
Volume-to-Capacity Ratio (*X*)		0.362	0.232	0.426	0.181					0.533		0.256
Back of Queue (Q), ft/ln (95 th percentile)		107.5	62.4	97.3	51.4					154.6		62.1
Back of Queue (Q), veh/ln (95 th percentile)		4.2	2.5	3.8	2.0					6.1		2.4
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (*d 1*), s/veh		19.9	19.1	23.8	7.2					21.1		19.3
Incremental Delay (*d 2*), s/veh		1.0	1.2	0.1	0.2					0.3		0.1
Initial Queue Delay (*d 3*), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay (*d*), s/veh		20.9	20.3	23.9	7.4					21.4		19.4
Level of Service (LOS)		C	C	C	A					C		B
Approach Delay, s/veh / LOS	20.8	C		15.0	B		0.0			21.0	C	
Intersection Delay, s/veh / LOS	18.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	1.9	B	3.0	C	2.9	C
Bicycle LOS Score / LOS	0.9	A	1.1	A				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks SB Ramp	File Name	SB35aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		567	401	250	412					600		135

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

								1	2	3	4
Green	15.0	30.0	20.0	0.0	0.0	0.0					
Yellow	4.0	4.0	4.0	0.0	0.0	0.0					
Red	1.0	1.0	1.0	0.0	0.0	0.0	5	6	7	8	

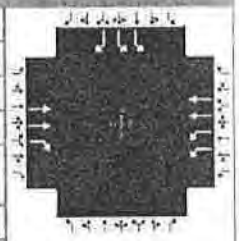
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	20.0	55.0				25.0
Change Period, (*Y+R c*), s		5.0	5.0	5.0				5.0
Max Allow Headway (*MAH*), s		0.0	3.1	0.0				3.2
Queue Clearance Time (*g s*), s			7.4					15.4
Green Extension Time (*g e*), s		0.0	0.4	0.0				1.0
Phase Call Probability			1.00					1.00
Max Out Probability			0.01					0.52

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate (*v*), veh/h		597	422	263	434					632		142
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1781	1585	1730	1781					1730		1585
Queue Service Time (*g s*), s		10.1	18.1	5.4	4.2					13.4		5.9
Cycle Queue Clearance Time (*g c*), s		10.1	18.1	5.4	4.2					13.4		5.9
Green Ratio (*g/C*)		0.38	0.38	0.19	0.62					0.25		0.25
Capacity (*c*), veh/h		1335	594	649	2226					865		396
Volume-to-Capacity Ratio (*X*)		0.447	0.710	0.406	0.195					0.730		0.359
Back of Queue (*Q*), ft/ln (95 th percentile)		185.8	299.7	97.9	61.7					239.5		97.8
Back of Queue (*Q*), veh/ln (95 th percentile)		7.3	11.8	3.9	2.4					9.4		3.8
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (*d 1*), s/veh		18.8	21.3	28.6	6.4					27.5		24.7
Incremental Delay (*d 2*), s/veh		1.1	7.0	0.2	0.2					2.8		0.2
Initial Queue Delay (*d 3*), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay (*d*), s/veh		19.9	28.3	28.7	6.6					30.3		24.9
Level of Service (LOS)		B	C	C	A					C		C
Approach Delay, s/veh / LOS	23.4	C		15.0	B		0.0			29.3	C	
Intersection Delay, s/veh / LOS	22.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	1.9	B	3.0	C	2.9	C
Bicycle LOS Score / LOS	1.3	A	1.1	A				F

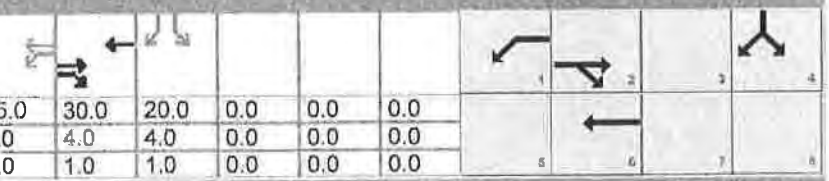
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks SB Ramp	File Name	SB35pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		507	277	300	807					500		208

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	15.0	30.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

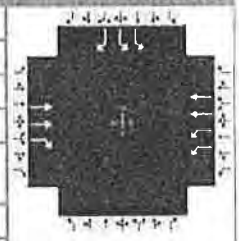
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	20.0	55.0				25.0
Change Period, ($Y+R_c$), s		5.0	5.0	5.0				5.0
Max Allow Headway (*MAH*), s		0.0	3.1	0.0				3.2
Queue Clearance Time (g_s), s			8.5					12.8
Green Extension Time (g_e), s		0.0	0.4	0.0				1.3
Phase Call Probability			1.00					1.00
Max Out Probability			0.05					0.15

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate (*v*), veh/h		534	292	316	849					526		219
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1781	1585	1730	1781					1730		1585
Queue Service Time (g_s), s		8.8	11.3	6.5	9.4					10.8		9.6
Cycle Queue Clearance Time (g_c), s		8.8	11.3	6.5	9.4					10.8		9.6
Green Ratio (*g/C*)		0.38	0.38	0.19	0.62					0.25		0.25
Capacity (*c*), veh/h		1335	594	649	2226					865		396
Volume-to-Capacity Ratio (*X*)		0.400	0.491	0.487	0.382					0.609		0.553
Back of Queue (*Q*), ft/ln (95 th percentile)		162.1	196.4	119.6	139.7					196		162.4
Back of Queue (*Q*), veh/ln (95 th percentile)		6.4	7.7	4.7	5.5					7.7		6.4
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (d_1), s/veh		18.4	19.1	29.1	7.4					26.5		26.1
Incremental Delay (d_2), s/veh		0.9	2.9	0.2	0.5					0.9		1.0
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay (*d*), s/veh		19.3	22.0	29.3	7.9					27.4		27.1
Level of Service (LOS)		B	C	C	A					C		C
Approach Delay, s/veh / LOS	20.2	C		13.7	B		0.0			27.3	C	
Intersection Delay, s/veh / LOS	19.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	1.9	B	3.0	C	2.9	C
Bicycle LOS Score / LOS	1.2	A	1.4	A				F

HCS7 Signalized Intersection Results Summary

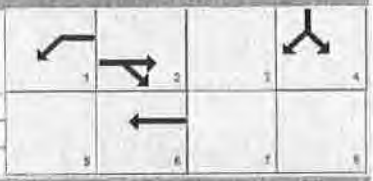
General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	AM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks SB Ramp	File Name	SB35aww.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		653	418	250	518					630		135

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	15.0		30.0	20.0	0.0	0.0	0.0					
Yellow	4.0		4.0	4.0	0.0	0.0	0.0					
Red	1.0		1.0	1.0	0.0	0.0	0.0					



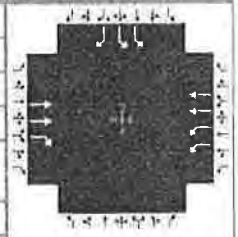
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	20.0	55.0				25.0
Change Period, (*Y+R c*), s		5.0	5.0	5.0				5.0
Max Allow Headway (*MAH*), s		0.0	3.1	0.0				3.2
Queue Clearance Time (*g s*), s			7.4					16.2
Green Extension Time (*g e*), s		0.0	0.4	0.0				0.9
Phase Call Probability			1.00					1.00
Max Out Probability			0.01					0.76

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate (*v*), veh/h		687	440	263	545					663		142
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1781	1585	1730	1781					1730		1585
Queue Service Time (*g s*), s		12.0	19.2	5.4	5.4					14.2		5.9
Cycle Queue Clearance Time (*g c*), s		12.0	19.2	5.4	5.4					14.2		5.9
Green Ratio (*g/C*)		0.38	0.38	0.19	0.62					0.25		0.25
Capacity (*c*), veh/h		1335	594	649	2226					865		396
Volume-to-Capacity Ratio (*X*)		0.515	0.740	0.406	0.245					0.767		0.359
Back of Queue (*Q*), ft/ln (95 th percentile)		214.8	317.6	97.9	80.2					254.7		97.8
Back of Queue (*Q*), veh/ln (95 th percentile)		8.5	12.5	3.9	3.2					10.0		3.8
Queue Storage Ratio (*RQ*) (95 th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (*d 1*), s/veh		19.4	21.6	28.6	6.6					27.8		24.7
Incremental Delay (*d 2*), s/veh		1.4	8.1	0.2	0.3					3.8		0.2
Initial Queue Delay (*d 3*), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay (*d*), s/veh		20.8	29.7	28.7	6.9					31.6		24.9
Level of Service (LOS)		C	C	C	A					C		C
Approach Delay, s/veh / LOS	24.3	C		14.0	B		0.0			30.4	C	
Intersection Delay, s/veh / LOS	23.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	1.9	B	3.0	C	2.9	C
Bicycle LOS Score / LOS	1.4	A	1.2	A				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 18, 2017	Area Type	Other
Jurisdiction	City of Sparks	Time Period	PM Peak Hour	PHF	0.95
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Pyramid/Sparks SB Ramp	File Name	SB35pww.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		641	294	300	961					531		208

Signal Information			
Cycle, s	80.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	15.0	30.0		20.0	0.0	0.0	0.0					
Yellow	4.0	4.0		4.0	0.0	0.0	0.0					
Red	1.0	1.0		1.0	0.0	0.0	0.0					

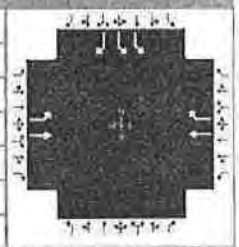
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		7.3	2.0	4.0				9.0
Phase Duration, s		35.0	20.0	55.0				25.0
Change Period, (Y+R c), s		5.0	5.0	5.0				5.0
Max Allow Headway (MAH), s		0.0	3.1	0.0				3.2
Queue Clearance Time (g s), s			8.5					13.6
Green Extension Time (g e), s		0.0	0.4	0.0				1.3
Phase Call Probability			1.00					1.00
Max Out Probability			0.05					0.23

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2	12	1	6					7		14
Adjusted Flow Rate (v), veh/h		675	309	316	1012					559		219
Adjusted Saturation Flow Rate (s), veh/h/ln		1781	1585	1730	1781					1730		1585
Queue Service Time (g s), s		11.7	12.1	6.5	11.9					11.6		9.6
Cycle Queue Clearance Time (g c), s		11.7	12.1	6.5	11.9					11.6		9.6
Green Ratio (g/C)		0.38	0.38	0.19	0.62					0.25		0.25
Capacity (c), veh/h		1335	594	649	2226					865		396
Volume-to-Capacity Ratio (X)		0.505	0.521	0.487	0.454					0.646		0.553
Back of Queue (Q), ft/ln (95 th percentile)		210.9	208.9	119.6	177.8					208.9		162.4
Back of Queue (Q), veh/ln (95 th percentile)		8.3	8.2	4.7	7.0					8.2		6.4
Queue Storage Ratio (RQ) (95 th percentile)		0.00	0.00	0.00	0.00					0.00		0.00
Uniform Delay (d 1), s/veh		19.3	19.4	29.1	7.9					26.8		26.1
Incremental Delay (d 2), s/veh		1.4	3.2	0.2	0.7					1.3		1.0
Initial Queue Delay (d 3), s/veh		0.0	0.0	0.0	0.0					0.0		0.0
Control Delay (d), s/veh		20.6	22.7	29.3	8.5					28.2		27.1
Level of Service (LOS)		C	C	C	A					C		C
Approach Delay, s/veh / LOS	21.3	C		13.5	B		0.0			27.9	C	
Intersection Delay, s/veh / LOS	19.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	1.9	B	3.0	C	2.9	C
Bicycle LOS Score / LOS	1.3	A	1.6	B				F

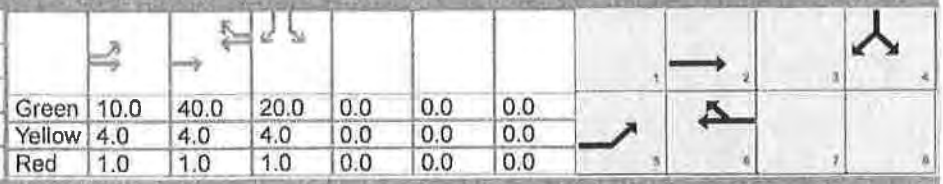
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa17aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	35	508			683	197				568		100

Signal Information			
Cycle, s	85.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	10.0	40.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

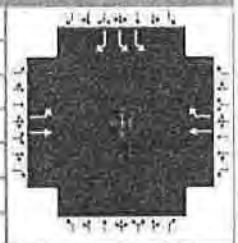
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	60.0		45.0				25.0
Change Period, ($Y+R_c$), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (g_s), s	3.6	14.6		31.6				16.1
Green Extension Time (g_e), s	0.0	3.2		2.5				0.8
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.00	0.01		0.32				0.70

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	38	552			742	171				617		109
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (g_s), s	1.6	12.6			29.6	5.4				14.1		4.8
Cycle Queue Clearance Time (g_c), s	1.6	12.6			29.6	5.4				14.1		4.8
Green Ratio (*g/C*)	0.12	0.65			0.47	0.47				0.24		0.24
Capacity (*c*), veh/h	210	1210			880	746				814		373
Volume-to-Capacity Ratio (*X*)	0.182	0.456			0.843	0.229				0.759		0.291
Back of Queue (*Q*), ft/ln (95 th percentile)	31.9	189.5			489.4	82.5				255.4		80.4
Back of Queue (*Q*), veh/ln (95 th percentile)	1.3	7.6			19.3	3.2				10.1		3.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (d_1), s/veh	33.8	7.5			19.8	13.3				30.3		26.7
Incremental Delay (d_2), s/veh	0.2	0.1			7.1	0.1				3.7		0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	34.0	7.6			26.9	13.4				34.0		26.8
Level of Service (LOS)	C	A			C	B				C		C
Approach Delay, s/veh / LOS	9.3	A		24.4	C		0.0			32.9	C	
Intersection Delay, s/veh / LOS	23.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	2.8	C	2.3	B
Bicycle LOS Score / LOS	1.5	A	2.0	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa17pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	98	688			629	555				334		59

Signal Information			
Cycle, s	85.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Green	10.0	40.0	20.0	0.0	0.0	0.0		
Yellow	4.0	4.0	4.0	0.0	0.0	0.0		
Red	1.0	1.0	1.0	0.0	0.0	0.0		

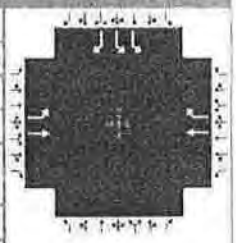
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	60.0		45.0				25.0
Change Period, (*Y+R c*), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (*g s*), s	6.8	22.0		27.9				9.6
Green Extension Time (*g e*), s	0.0	4.6		4.0				0.8
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.87	0.13		0.29				0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	107	748			684	495				363		64
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (*g s*), s	4.8	20.0			25.9	20.4				7.6		2.7
Cycle Queue Clearance Time (*g c*), s	4.8	20.0			25.9	20.4				7.6		2.7
Green Ratio (*g/C*)	0.12	0.65			0.47	0.47				0.24		0.24
Capacity (*c*), veh/h	210	1210			880	746				814		373
Volume-to-Capacity Ratio (*X*)	0.508	0.618			0.777	0.663				0.446		0.172
Back of Queue (*Q*), ft/ln (95 th percentile)	94	280.1			420.4	291.8				139.3		46
Back of Queue (*Q*), veh/ln (95 th percentile)	3.7	11.0			16.6	11.5				5.5		1.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (*d 1*), s/veh	35.2	8.8			18.8	17.3				27.8		25.9
Incremental Delay (*d 2*), s/veh	0.8	0.7			4.0	1.8				0.1		0.1
Initial Queue Delay (*d 3*), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	36.0	9.5			22.8	19.1				27.9		26.0
Level of Service (LOS)	D	A			C	B				C		C
Approach Delay, s/veh / LOS	12.8	B		21.3	C		0.0			27.6	C	
Intersection Delay, s/veh / LOS	19.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	2.9	C	2.3	B
Bicycle LOS Score / LOS	1.9	B	2.4	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project + Kiley	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa17awo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	35	523			696	197				568		100

Signal Information			
Cycle, s	85.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	40.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

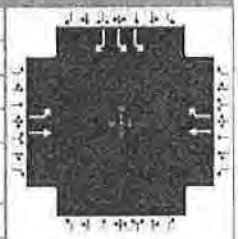
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	60.0		45.0				25.0
Change Period, (*Y+R c*), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (*g s*), s	3.6	15.1		32.6				16.1
Green Extension Time (*g e*), s	0.0	3.3		2.4				0.8
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.00	0.01		0.40				0.70

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	38	568			757	171				617		109
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (*g s*), s	1.6	13.1			30.6	5.4				14.1		4.8
Cycle Queue Clearance Time (*g c*), s	1.6	13.1			30.6	5.4				14.1		4.8
Green Ratio (*g/C*)	0.12	0.65			0.47	0.47				0.24		0.24
Capacity (*c*), veh/h	210	1210			880	746				814		373
Volume-to-Capacity Ratio (*X*)	0.182	0.470			0.860	0.229				0.759		0.291
Back of Queue (*Q*), ft/ln (95 th percentile)	31.9	196.1			509.1	82.5				255.4		80.4
Back of Queue (*Q*), veh/ln (95 th percentile)	1.3	7.7			20.0	3.2				10.1		3.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (*d 1*), s/veh	33.8	7.6			20.0	13.3				30.3		26.7
Incremental Delay (*d 2*), s/veh	0.2	0.1			8.2	0.1				3.7		0.2
Initial Queue Delay (*d 3*), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	34.0	7.7			28.2	13.4				34.0		26.8
Level of Service (LOS)	C	A			C	B				C		C
Approach Delay, s/veh / LOS	9.4	A		25.5	C		0.0			32.9	C	
Intersection Delay, s/veh / LOS	23.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	2.8	C	2.3	B
Bicycle LOS Score / LOS	1.5	A	2.0	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction	NDOT	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project + Kiley	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa17pwo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	98	703			643	555				334		59

Signal Information			
Cycle, s	85.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	40.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

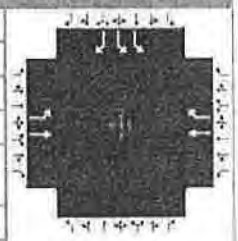
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	60.0		45.0				25.0
Change Period, ($Y+R_c$), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (g_s), s	6.8	22.7		28.8				9.6
Green Extension Time (g_e), s	0.0	4.6		4.0				0.8
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.87	0.15		0.34				0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	107	764			699	495				363		64
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (g_s), s	4.8	20.7			26.8	20.4				7.6		2.7
Cycle Queue Clearance Time (g_c), s	4.8	20.7			26.8	20.4				7.6		2.7
Green Ratio (*g/C*)	0.12	0.65			0.47	0.47				0.24		0.24
Capacity (*c*), veh/h	210	1210			880	746				814		373
Volume-to-Capacity Ratio (*X*)	0.508	0.631			0.794	0.663				0.446		0.172
Back of Queue (*Q*), ft/ln (95 th percentile)	94	289.5			436.7	291.8				139.3		46
Back of Queue (*Q*), veh/ln (95 th percentile)	3.7	11.4			17.2	11.5				5.5		1.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (d_1), s/veh	35.2	9.0			19.0	17.3				27.8		25.9
Incremental Delay (d_2), s/veh	0.8	0.8			4.7	1.8				0.1		0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	36.0	9.8			23.7	19.1				27.9		26.0
Level of Service (LOS)	D	A			C	B				C		C
Approach Delay, s/veh / LOS	13.0	B		21.8	C		0.0			27.6	C	
Intersection Delay, s/veh / LOS	19.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	2.9	C	2.3	B
Bicycle LOS Score / LOS	1.9	B	2.5	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa35aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	35	400			350	197				568		100

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	25.0	20.0	0.0	0.0	0.0	1	2	3	4		
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	5	6	7	8		
Red	1.0	1.0	1.0	0.0	0.0	0.0						

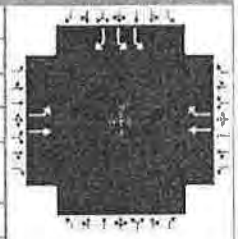
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	45.0		30.0				25.0
Change Period, ($Y+R_c$), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (g_s), s	3.3	11.1		13.5				12.9
Green Extension Time (g_e), s	0.0	1.8		1.7				1.2
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.00	0.02		0.05				0.14

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	38	435			380	171				617		109
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (g_s), s	1.3	9.1			11.5	5.4				10.9		3.7
Cycle Queue Clearance Time (g_c), s	1.3	9.1			11.5	5.4				10.9		3.7
Green Ratio (*g/C*)	0.14	0.57			0.36	0.36				0.29		0.29
Capacity (*c*), veh/h	254	1069			668	566				988		453
Volume-to-Capacity Ratio (*X*)	0.150	0.407			0.570	0.301				0.625		0.240
Back of Queue (*Q*), ft/ln (95 th percentile)	24.4	137.1			206.8	82.7				190.9		58
Back of Queue (*Q*), veh/ln (95 th percentile)	1.0	5.4			8.1	3.3				7.5		2.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (d_1), s/veh	26.3	8.4			18.2	16.2				21.7		19.2
Incremental Delay (d_2), s/veh	0.1	0.1			0.7	0.1				0.9		0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	26.4	8.5			18.9	16.3				22.7		19.3
Level of Service (LOS)	C	A			B	B				C		B
Approach Delay, s/veh / LOS	9.9	A		18.1	B		0.0			22.2	C	
Intersection Delay, s/veh / LOS	17.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	2.8	C	2.3	B
Bicycle LOS Score / LOS	1.3	A	1.4	A				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa35pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	98	450			460	555				334		59

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	25.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

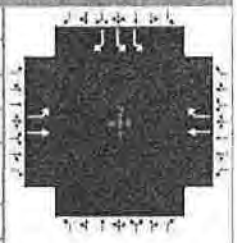
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	45.0		30.0				25.0
Change Period, (*Y+R c*), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (*g s*), s	5.8	12.6		18.4				7.9
Green Extension Time (*g e*), s	0.1	2.6		2.0				0.8
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.25	0.11		0.44				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	107	489			500	386				363		64
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (*g s*), s	3.8	10.6			16.4	14.5				5.9		2.1
Cycle Queue Clearance Time (*g c*), s	3.8	10.6			16.4	14.5				5.9		2.1
Green Ratio (*g/C*)	0.14	0.57			0.36	0.36				0.29		0.29
Capacity (*c*), veh/h	254	1069			668	566				988		453
Volume-to-Capacity Ratio (*X*)	0.419	0.458			0.749	0.682				0.367		0.142
Back of Queue (*Q*), ft/ln (95 th percentile)	71.5	160			293.8	227.6				100.4		33.2
Back of Queue (*Q*), veh/ln (95 th percentile)	2.8	6.3			11.6	9.0				4.0		1.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (*d 1*), s/veh	27.3	8.7			19.7	19.1				20.0		18.6
Incremental Delay (*d 2*), s/veh	0.4	0.1			4.2	2.8				0.1		0.1
Initial Queue Delay (*d 3*), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	27.8	8.8			23.9	21.9				20.0		18.7
Level of Service (LOS)	C	A			C	C				C		B
Approach Delay, s/veh / LOS	12.2	B		23.0	C		0.0			19.8	B	
Intersection Delay, s/veh / LOS	18.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	3.0	C	2.3	B
Bicycle LOS Score / LOS	1.5	A	1.9	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base + Project + Kiley	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa35awo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	35	415			363	197				568		100

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

								1	2	3	4	
Green	10.0	25.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0	5	6	7	8		

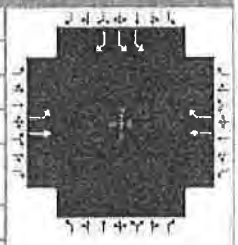
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	45.0		30.0				25.0
Change Period, ($Y+R_c$), s	5.0	5.0		5.0				5.0
Max Allow Headway (*MAH*), s	3.1	3.1		3.1				3.2
Queue Clearance Time (g_s), s	3.3	11.5		14.0				12.9
Green Extension Time (g_e), s	0.0	1.8		1.7				1.2
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.00	0.03		0.07				0.14

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	38	451			395	171				617		109
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (g_s), s	1.3	9.5			12.0	5.4				10.9		3.7
Cycle Queue Clearance Time (g_c), s	1.3	9.5			12.0	5.4				10.9		3.7
Green Ratio (*g/C*)	0.14	0.57			0.36	0.36				0.29		0.29
Capacity (*c*), veh/h	254	1069			668	566				988		453
Volume-to-Capacity Ratio (*X*)	0.150	0.422			0.591	0.301				0.625		0.240
Back of Queue (*Q*), ft/ln (95 th percentile)	24.4	144			215.6	82.7				190.9		58
Back of Queue (*Q*), veh/ln (95 th percentile)	1.0	5.7			8.5	3.3				7.5		2.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (d_1), s/veh	26.3	8.5			18.3	16.2				21.7		19.2
Incremental Delay (d_2), s/veh	0.1	0.1			1.0	0.1				0.9		0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	26.4	8.6			19.3	16.3				22.7		19.3
Level of Service (LOS)	C	A			B	B				C		B
Approach Delay, s/veh / LOS	10.0	A		18.4	B		0.0			22.2	C	
Intersection Delay, s/veh / LOS	17.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	2.8	C	2.3	B
Bicycle LOS Score / LOS	1.3	A	1.4	A				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Solaegui Engineers			Duration, h	0.25
Analyst	MSH	Analysis Date	Sep 13, 2017	Area Type	Other
Jurisdiction		Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base + Project + Other	Analysis Period	1> 7:00
Intersection	Highland Ranch & Access	File Name	HrPa35pwo.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	98	465			474	555				334		59

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	25.0	20.0	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	1.0	1.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	2.0	4.0		7.3				9.0
Phase Duration, s	15.0	45.0		30.0				25.0
Change Period, ($Y+R_c$), s	5.0	5.0		5.0				5.0
Max Allow Headway (MAH), s	3.1	3.1		3.1				3.2
Queue Clearance Time (g_s), s	5.8	13.1		19.1				7.9
Green Extension Time (g_e), s	0.1	2.7		1.9				0.8
Phase Call Probability	1.00	1.00		1.00				1.00
Max Out Probability	0.25	0.14		0.53				0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (v), veh/h	107	505			515	386				363		64
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1870			1870	1585				1730		1585
Queue Service Time (g_s), s	3.8	11.1			17.1	14.5				5.9		2.1
Cycle Queue Clearance Time (g_c), s	3.8	11.1			17.1	14.5				5.9		2.1
Green Ratio (g/C)	0.14	0.57			0.36	0.36				0.29		0.29
Capacity (c), veh/h	254	1069			668	566				988		453
Volume-to-Capacity Ratio (X)	0.419	0.473			0.771	0.682				0.367		0.142
Back of Queue (Q), ft/ln (95 th percentile)	71.5	167.3			307.9	227.6				100.4		33.2
Back of Queue (Q), veh/ln (95 th percentile)	2.8	6.6			12.1	9.0				4.0		1.3
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00				0.00		0.00
Uniform Delay (d_1), s/veh	27.3	8.8			20.0	19.1				20.0		18.6
Incremental Delay (d_2), s/veh	0.4	0.1			5.0	2.8				0.1		0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (d), s/veh	27.8	8.9			25.0	21.9				20.0		18.7
Level of Service (LOS)	C	A			C	C				C		B
Approach Delay, s/veh / LOS	12.2	B		23.7	C		0.0			19.8	B	
Intersection Delay, s/veh / LOS	19.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.4	B	3.0	C	2.3	B
Bicycle LOS Score / LOS	1.5	A	2.0	B				F

HCS7 Two-Way Stop-Control Report

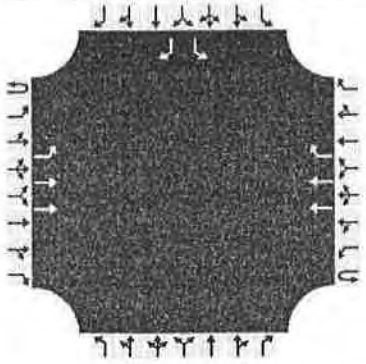
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	9/15/2017
Analysis Year	2017
Time Analyzed	AM Ex. + Project + Other
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Highland Ranch & Frontage
Jurisdiction	City of Sparks
East/West Street	Highland Ranch Parkway
North/South Street	Frontage Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume, V (veh/h)		37	1054				869	117						125		24
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		40												136		26
Capacity, c (veh/h)		646												91		538
v/c Ratio		0.06												1.49		0.05
95% Queue Length, Q_{95} (veh)		0.2												10.5		0.2
Control Delay (s/veh)		10.9												352.5		12.0
Level of Service, LOS		B												F		B
Approach Delay (s/veh)		0.4												297.8		
Approach LOS														F		

HCS7 Two-Way Stop-Control Report

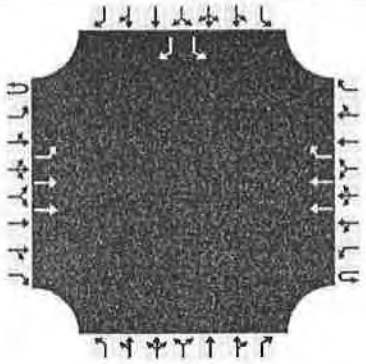
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	9/15/2017
Analysis Year	2017
Time Analyzed	PM Ex. + Project + Other
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Highland Ranch & Frontage
Jurisdiction	City of Sparks
East/West Street	Highland Ranch Parkway
North/South Street	Frontage Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume, V (veh/h)		28	1009				1158	180						164		40
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		30												178		43
Capacity, c (veh/h)		461												60		424
v/c Ratio		0.07												2.97		0.10
95% Queue Length, Q_{95} (veh)		0.2												18.4		0.3
Control Delay (s/veh)		13.4												1036.1		14.4
Level of Service, LOS		B												F		B
Approach Delay (s/veh)		0.4												837.3		
Approach LOS														F		

HCS7 Two-Way Stop-Control Report

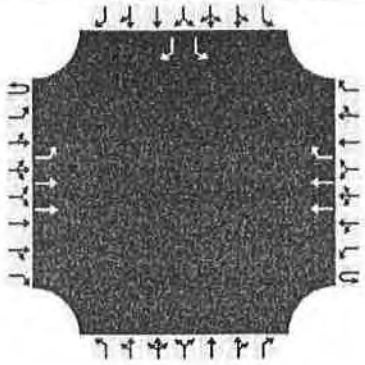
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	9/15/2017
Analysis Year	2035
Time Analyzed	AM Base + Project + Other
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Highland Ranch & Frontage
Jurisdiction	City of Sparks
East/West Street	Highland Ranch Parkway
North/South Street	Frontage Road
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume, V (veh/h)		37	946				536	117						125		24
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		39												132		25
Capacity, c (veh/h)		903												186		715
v/c Ratio		0.04												0.71		0.03
95% Queue Length, Q_{95} (veh)		0.1												4.4		0.1
Control Delay (s/veh)		9.2												61.2		10.2
Level of Service, LOS		A												F		B
Approach Delay (s/veh)		0.3												53.0		
Approach LOS														F		

HCS7 Two-Way Stop-Control Report

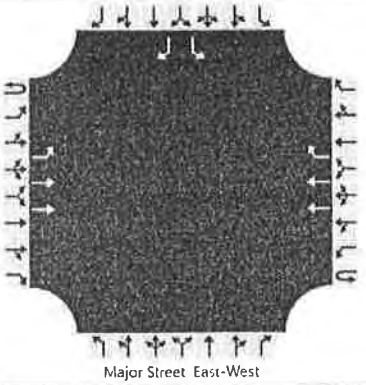
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	9/15/2017
Analysis Year	2035
Time Analyzed	PM Base + Project + Other
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Highland Ranch & Frontage
Jurisdiction	City of Sparks
East/West Street	Highland Ranch Parkway
North/South Street	Frontage Road
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume, V (veh/h)		28	771				989	180						164		40
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		29												173		42
Capacity, c (veh/h)		562												106		501
v/c Ratio		0.05												1.63		0.08
95% Queue Length, Q_{95} (veh)		0.2												13.2		0.3
Control Delay (s/veh)		11.7												392.3		12.8
Level of Service, LOS		B												F		B
Approach Delay (s/veh)		0.4												318.2		
Approach LOS														F		