Planning & Zoning Commission Draft

P23RZ00003
Site Inventory & Land Use Proposal

S. Headley Road
(Rezoning Application from SH to CR-5)

Property Owner:

Stinson Family Trust

Pima County Case No. P23RZ00003

July, 2023

P23RZ00003
Stinson Family Trust
S. Headley Road Rezoning

Rezoning Request from SH to CR-5
Pima County, Arizona

Submitted to:

Pima County Development Services Department
Planning Division
201 N. Stone Avenue – 2nd Floor
Tucson, Arizona 85701

Property Owner:

Stinson Family Trust
4937 E. 5th Street – Suite 115
Tucson, AZ 85711-2282

Prepared By:

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Tucson, Arizona 85739

July, 2023

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SECTION I:

Site Inventory

A. EXISTING LAND USES

1. Site Location and Regional Context

The subject rezoning property is a portion of the SE ¼ of the NW ¼ of Section 15, T15S, R13E, and is more particularly located between S. Headley Road (on the west) and S. Valley Indian Agency Connect Road (on the east), approximately ¼ mile south of Valencia Road. The rezoning site consists of two (2) parcels (Assessors Tax Code Nos. 138-24-0310 & 0320) and comprises approximately 15.1 AC in gross area.

The subject site lies within the established W. Valencia Road corridor and is part of a small remaining "peninsula" of unincorporated Pima County that is abutted on three sides by the City of Tucson to the east, west and north. The adjoining uses still within Pima County include unsubdivided residential parcels (manufactured or site-built homes), as well as the Midvale Christian Center. The more intensive nearby uses tend to fall within the City limits, including a large neighborhood shopping center to the north with an anchor store, various stand-alone commercial goods & services and restaurant pads, three (3) platted single-family residential subdivisions to the west (totaling slightly more than 200 lots), and a park-industrial warehouse (presently vacant) to the immediate east.

2. Existing On-Site Land Uses

The property presently contains several mobile-home residences; these will be removed with the proposed project. The site has been almost totally graded and cleared of vegetation by historical agricultural activities and the more recent residential uses. There is very little significant vegetation of note still remaining.

3. Existing Easements or Encumbrances

Fidelity National Title Report No. 20001212-020-BOR-PK3, dated November 15, 2022 lists several rather dated Schedule "B" items (easements or matters of record) pertaining to the subject property (same are also depicted on Exhibit I-A):

- A United States of America instrument recorded during the Ulysses S. Grant administration (Bk. 4 of Deeds, P. 146) pertaining to miscellaneous blanket water rights for mining, agricultural, manufacturing, or other purposes for ditches and reservoirs.
- A largely illegible 1946 easement (no specific location given) for electric lines (Bk. 97 of Miscellaneous Records, P. 564).
- A 1948 blanket easement over the property for the maintenance or electric lines and system.
- A wholly illegible instrument (date indecipherable) for telephone and telegraph lines (Dkt. 733, P. 258).
- A 1959 easement (7.5' and 15' wide segments) granted to the property owners for miscellaneous utility needs (Bk. 2851, P. 188).
- A 1976 instrument pertaining to miscellaneous restrictions and covenants pertaining to an issued floodplain use permit (Dkt. 5373, P. 718).

- A 1986 agreement for a water meter for the address of 1936 W. Los Reales Road (Dkt. 7798, P. 1453), which does not appear to pertain to the subject property of this rezoning.

The provision of all new easements for utility service will be negotiated and arranged at the time of final engineering and permitting; this can be considered routine.

4. Comprehensive Plan (Pima Prospers) Designations

The rezoning site is designated as *Medium Low Intensity Urban (MLIU)* by Pima Prospers, per Board of Supervisors Resolution 2022-71 as adopted November 15, 2022 (see Appendix "A"). No (0) rezoning policies were stipulate with this approval. The surrounding properties are designated as follows:

To the **North:**	LIU 3.0
To the **South:**	A mix of MLIU (per February 7, 2023 BOS approval of Case No. P22CA00003) and LIU 3.0
To the **East:**	City of Tucson (no Plan Tucson designation)
To the **West:**	City of Tucson (no Plan Tucson designation)

No (0) Special Area policies apply to this rezoning site. However, it must be noted that the southern portion of the rezoning area falls within Use Restriction Zone "C" of the San Xavier Historic Mission Zone per Sec. 18.63.100. This is the least-restrictive designation of the Zone and prescribes certain limitations on density, height and other development standards. The proposed project will fully conform with same.

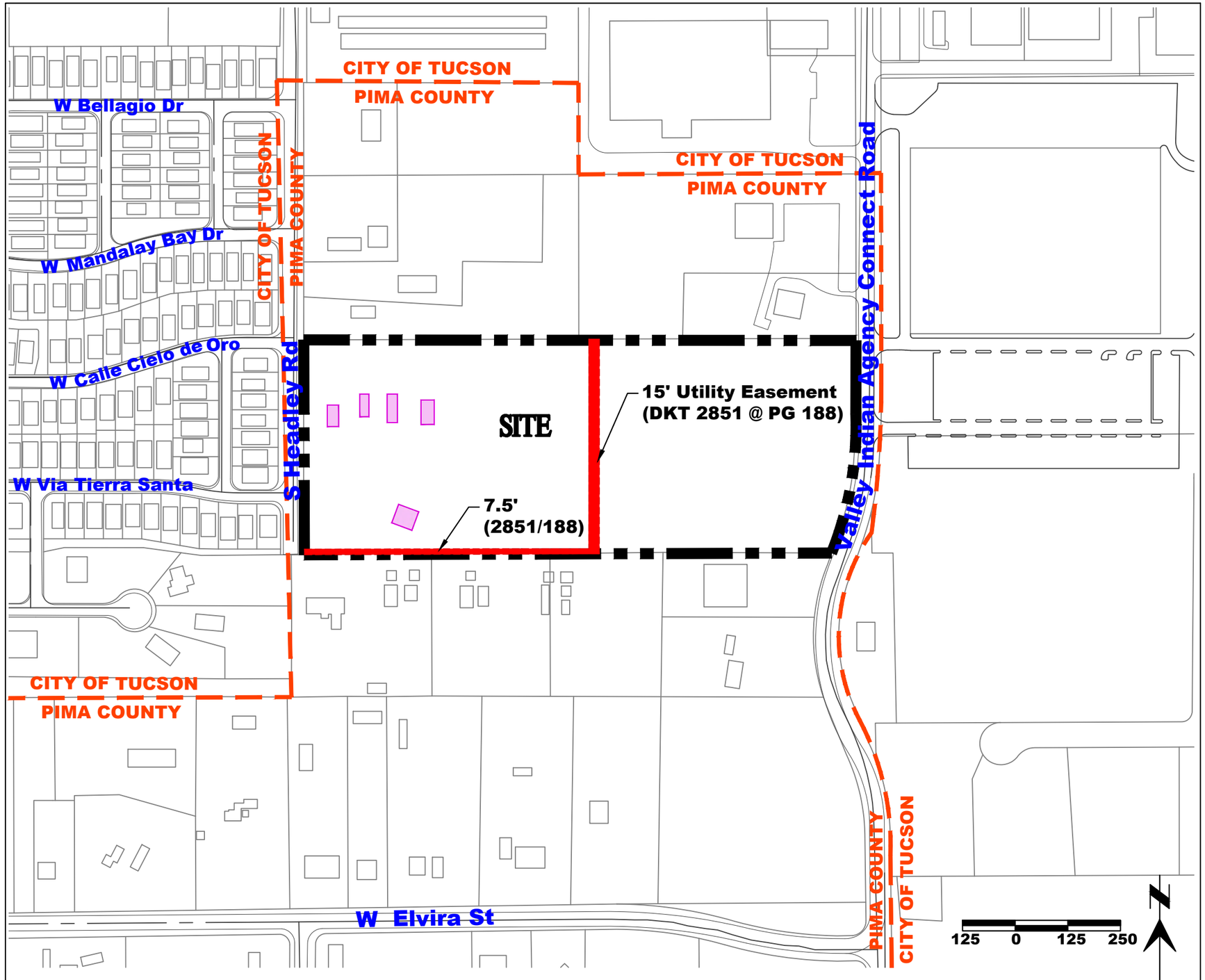
5. Surrounding Land Uses

The properties surrounding the subject site are a mixture of developed residential and vacant land:

To the **North:**	Unsubdivided residential (manufactured homes) and the Midvale Christian Center campus
To the **South:**	Unsubdivided residential (manufactured homes and site-built residences)
To the **East:**	Industrial warehouse complex (currently vacant) within the City of Tucson
To the **West:**	Platted residential subdivisions within the City of Tucson, totaling slightly more than 200 lots.

6. Pending Rezonings, Plats & Development Plans

There are no other pending rezoning, plats or development plans anywhere in the project vicinity at the present time. A 5-acre property to the immediate south secured a recent comprehensive plan amendment approval (February 7, 2023) per Case No. P22CA00003. It is unknown as to when the owner/developer may be proceeding with a subsequent rezoning request.



LEGEND

SITE — **Rezoning Site**

Limits of Existing Easements (Recording Information provided on map)

Existing Structures On-Site (manufactured homes); to be removed.

Off-Site Structures

Schedule "B" Items Per Title Report

Fidelity National Title Report No. 20001212-020-BOR-PK3, dated November 15, 2022 lists several rather dated Schedule "B" items (easements or matters of record) pertaining to the subject property:

- A United States of America instrument recorded during the Ulysses S. Grant administration (Bk 4 of Deeds, P. 146) pertaining to miscellaneous blanket water rights for mining, agricultural, manufacturing, or other purposes for ditches and reservoirs.
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- A 1986 agreement for a water meter for the address of 1936 W. Los Reales Road (Dkt. 7798, P. 1453), which does not appear to pertain to the subject property of this rezoning.

The utility and easement matters on this project can be considered routine. The abandonment or relocation of existing encumbrances, together with the provision of all new easements with servicing utility companies, will be accomplished and at the time of final engineering and permitting.

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT I-A
EXISTING EASEMENTS/ ENCUMBRANCES
PAGE 3

B. TOPOGRAPHY & GRADING

1. Topographic Characteristics

The rezoning site is, for all intents and purposes, flat in the extreme. It slopes minimally from south/southwest to north/northeast, falling a little more than four feet (4') over its entire diagonal length. This results in a nominal slope of less than 1/3 of one (1) percent (0.003).

See Exhibit I-B for existing conditions contours and topographic features.

a. Restricted Peaks & Ridges

There are no restricted peaks or ridges on the property.

b. Rock Outcroppings, etc.

There are no rock outcroppings, etc. on the subject property.

c. Slope of 15% or Greater

The project site contains no (0) slopes of fifteen percent (15%) or greater that are longer than fifty feet (50'), when measured in any horizontal direction, and higher than seven and one half feet (7.5') when measured vertically.

d. Other Significant Topographic Features

There are no significant or remarkable topographic features whatsoever.

e. Existing Grading and/or Ground Disturbance

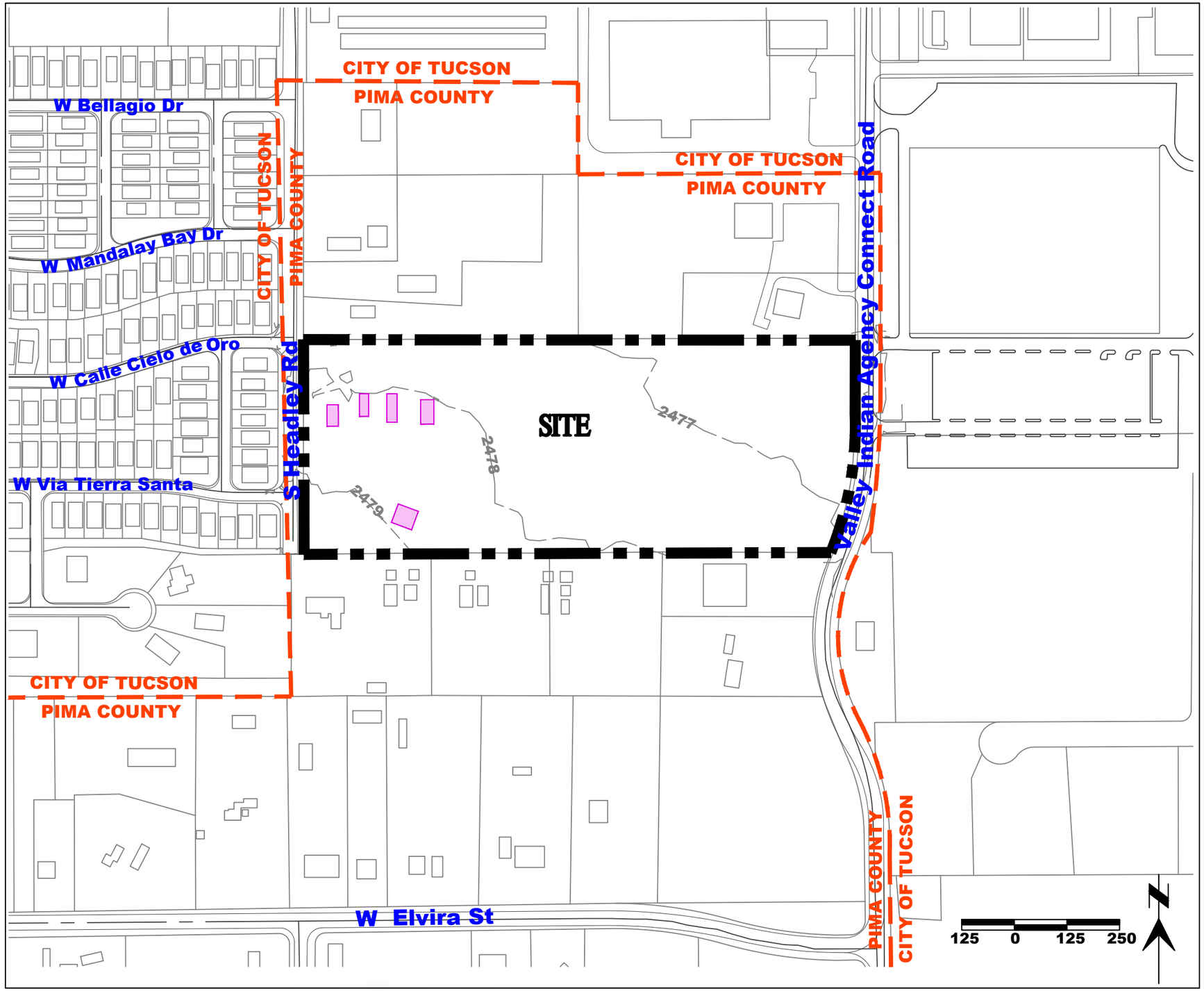
The site has essentially been graded and cleared of all natural vegetation, this being the result of past agricultural activity, and then its subsequent use for single-family residential occupation (manufactured homes).

2. Pre-Development Average Cross-Slope

The average cross-slope calculation for the subject property, in accordance with Chapter 18.61 (Hillside Development Zone), is as follows:

$$\frac{(1' \text{ Contour Interval}) \times (3{,}250 \text{ Total Length of Contours}) \times (0.0023 \text{ Conversion})}{(15.5 \text{ AC Total Site Area})}$$

The resultant Average Cross Slope (ACS) = 0.48%.



LEGEND

SITE — **Rezoning Site**

Existing Condition Topographic Contour (1' Interval)

Existing Structures (Manufactured Homes); to be removed

NOTES:

1. **This entire site has been disturbed by past activities.**
2. **This site contains no (0) slopes of 15% or greater.**

Average Cross Slope Calculations

The average cross-slope calculation for the subject property, in accordance with Chapter 18.61 (Hillside Development Zone), is as follows:

$$\frac{\text{(1' Contour Interval) x (3,250 Total Length of Contours) x (0.0023 Conversion)}}{\text{(15.5 AC Total Site Area)}}$$

The resultant Average Cross Slope (ACS) = 0.48%

This site has a nominal downward slope, from southwest to northeast, of less than 1%.

Source of Topography:
Pima Association of Governments (PAG)

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EXHIBIT I-B
TOPOGRAPHIC CHARACTERISTICS
PAGE 5

C. HYDROLOGY

Bowman Consulting has completed a preliminary drainage assessment for the prospective development located at 6645 South Headley Road, near W. Valencia Road and S. Headley Road, specifically for Pima County Parcels #138-24-0320 & 138-24-0310. A supplemental study of off-site conditions has also been completed by JE Fuller Hydrology & Geomorphology, Inc. and is provided in Appendix "B" of this Site Analysis document.

1. Offsite Hydrology

The project site is impacted by offsite storm water run-on to the property from three delineated drainage areas to the south of the site. These areas will deliver storm water to the site in the form of sheet flow and semi-concentrated flow. These drainage areas exist between Elvira Road on the south, and the southern project boundary on the north; they are labeled as O-1, O-2, and O-3 from west to east, and were determined to deliver between 21 and 35 cfs of peak discharge during the 1% annual chance (100-year) event; see Exhibit I-C.1. These peak flows were determined using the Pima County Hydrology Procedures, as presented within the PC-Hydro User Guide, and available online as PC-Hydro Version 7.1.

Since there was some question whether or not Elvira Road functions as a drainage divide in this area, a separate 2-dimensional modeling exercise, using HEC-RAS was completed by JE Fuller Hydrology & Geomorphology, Inc. and incorporated all contributing areas further south. It was determined that Elvira Road does, in-fact, represent a drainage divide, as flows in the 2-dimensional model did not cross Elvira Road. Please see Appendix "B" for the findings of this separate study.

2. Onsite Hydrology

Exhibit I.C-2 (Existing Onsite Hydrology) depicts the relevant conditions of onsite hydrology. Below is a list of the pertinent items:

2a. Flood Control Resource Areas

There are no flood control resource areas on the project site. The closest flood control resource area is the Oak Tree Channel, which exists on the east side of Indian Agency Road, and is a constructed roadside channel, that conveys storm water north under Valencia Road before turning west to drain into the Santa Cruz River West Branch. There are no locally nor Federally mapped floodplains on, or adjacent to, the project site. There are also no mapped riparian areas on, or adjacent to, the project site.

2b. Concentration Points and 100-Year Peak Discharges

The existing condition onsite watersheds were divided into four (4) drainage areas according to the surveyed topography; Areas 1, 2, 3, and 4, with contributing areas and respective 1% annual chance peak discharge rates as shown in Table 1 below. Also see Exhibit I-C.2. These drainage areas do not include the offsite drainage areas O-1, O-2, and O-3.

The hydrologic computation procedure utilized was again the Pima County Hydrology Procedures, as presented within the PC-HYDRO User Guide. This was used to compute the peak discharges. PC-Hydro, Version 7.1, was used to estimate the existing condition 1% annual chance onsite peak discharges generated on the site. PC-Hydro is a web-based computer program which uses the Rational Method and Curve Number algorithms, and utilizes rainfall depth information from the intensity-duration-frequency upper 90% confidence limit data from NOAA Precipitation Atlas 14 of the Western United States. Specific watershed parameters were estimated per the Pima County Hydrology Procedures guidelines, and are based in the onsite topography developed by Bowman Consulting in December of 2022.

Hydrologic soil groups (HSG) for the existing and proposed condition drainage areas were determined from the Natural Resources Conservation Service (NRCS) web soil survey GIS layers for soils information. Only HSG group C is represented within the project site.

PC-Hydro computations, similar to the Rational Method, assume that rainfall is uniformly distributed over the entire watershed, uniform rainfall intensity occurs with a duration of at least the time of concentration, peak rate of runoff is proportional to rainfall intensity, and rainfall depth averaged over the time period is equal to the time of concentration, the return period of the runoff event is the same as the return period of the precipitation event, and that channel storage is negligible.

Table 1 summarizes the hydrologic results for the onsite existing conditions, and does not include any contribution from areas upstream of the project site.

Table 1: Existing Condition Onsite 1% Annual Chance (100-Year) Hydrology Results

Drainage Area ID	Watershed Area A (acres)	Runoff Coeff. C_w (dim)	Time of Conc. T_c (min)	Rainfall Intensity i (in/hr)	Runoff Supply Rate q (in/hr)	1% Annual Chance Peak Discharge (ft^3/s)
1	1.97	0.64	6.4	10.08	6.40	**13**
2	2.78	0.63	5.8	9.72	6.14	**17**
3	6.44	0.63	12.3	7.15	4.47	**29**
4	3.86	0.62	7.5	8.77	5.46	**21**

2c. FEMA-Designated and Locally Identified Floodplains

The project area is covered in the FEMA Flood Insurance Rate Map Panel 2270, Map Number 04019C2270L, with an effective date of June 16, 2011. As shown on the map, the project site is within Zone X. Zone X is defined as

an area outside the 0.2% annual chance flood limits. Because detailed hydraulic analyses have not been performed in the immediate area, no Base Flood Elevations (BFE's) or flood depths have been established for the site. There are currently no locally identified or studied floodplains within the project site.

2d. Floodplain Delineation

Because there are neither FEMA nor local regulatory floodplains present on or adjacent to the site, no floodplain delineations are provided on the exhibits associated with this document.

2e. Regulatory Sheet Flood Areas

Shallow sheet flow enters the property in several areas along its southern boundary. In light of this, together with the size of the upstream contributing watershed, this site is considered subject to regulatory sheet flow. Provisions are made in the post-development condition to accept incoming sheetflow volumes, convey them through the site via a series of interconnected basins, and outletting these flows at reduced volumes. The proposed drainage design for the project is conceptually discussed in Sec. I.C.3.a below, and detailed in Section II.D of this Site Analysis.

2f. Sources of Perennial Surface Water

There are no sources of perennial surface water at or near the project site. This would include lakes, ponds, wetlands, springs, or any other possible sources of perennial surface water.

2g. Erosion Hazard Setbacks

Because the storm water conveyance at the project site is characterized by sheet flow, there are no conveyance corridors on, or adjacent to, the project site that create an erosion hazard. As such, there are no erosion hazard setbacks delineated for this project.

2h. Regulated Riparian Habitat

There is no mapped or regulated riparian habitat on, or adjacent to, the project site. The nearest mapped riparian area is associated with the Santa Cruz River, and the Santa Cruz River West Branch.

2i. Flow Arrows for Non-Regulatory Flows

Flow arrows for all discharges flowing within and off the project site are indicated on Exhibit I-C.2 (Onsite Hydrology).

2j. Existing Drainage Easements

There are no existing drainage easements on the project site.

2k. Existing Drainage Infrastructure

There is no existing constructed drainage infrastructure on the project site. There is an existing channel, known as the Oak Tree Channel, on the east side of Indian Agency Road, which is crossed by two driveways with culverts within the segment of Indian Agency Road adjacent to the project site.

3. Hydrology

3a. Watershed Features

The subject property parcel existing condition is primarily undeveloped land with the exception of a few existing manufactured homes on the west side of the project site, and a small network of primitive dirt roads. These will be eliminated with the development of the property. Vegetation across the site is composed of scrub desert brush and random cacti, with a relative sparse cover density of approximately 15%.

Soils across the site are comprised of a single soil type: Grabe Silty Clay Loam, which is classified as Hydrologic Soil Group (HSG) C hydrology purposes. The existing onsite drainage areas are divided into four (4) watersheds. All of these drainage areas discharge along the north project boundary, into the several existing residential and commercial properties there.

Offsite storm water runoff enters the site from the southern property boundary, and exits the site along the northern property line. Offsite drainage runoff is generated from significant upland areas (south to Elvira Road) consisting of valley terrain featuring large-lot suburban land use.

Per the Pima County Regional Flood Control District (PCRFCD) Critical Basins Map within Unincorporated Pima County, with an effective date of 3/15/2007, the subject property was determined to be within the Valencia Wash critical basin. As a requirement of the current PCRFCD Design Standards for Stormwater Detention and Retention, new developments must demonstrate appropriate measures to reduce post-development peak discharges, generated from the developed onsite areas, to 90% of pre-developed peak discharge rates at the project boundary for the 50%, 10%, and 1% annual chance events. Multiple retention/detention basins are proposed for this subdivision as a method to reduce post-development peak discharge rates to the required discharge rates per the Pima County design standards. The retention/detention basins will be equipped with storage volume and outlet structures consisting of appropriate weir/pipe outlet configurations to obtain the appropriate site outfall discharge rates and sheet flow characteristics.

Storm water generated onsite will be directed to one of two retention/ spreader basins along the northern boundary of the site. Storm water will leave the site by overtopping the north side of these basins, and will be released as sheet flow.

3b. Acreage and 100-Year Peak Discharge of Upstream Watersheds

The boundary of the offsite watersheds contributing storm water runoff to the project site are shown on Exhibit I-C.1 (Offsite Hydrology). There are three (3) offsite drainage areas affecting this site, which extend generally from south to north, and are composed of primarily large-lot suburban development within valley terrain.

Peak discharges were determined using PC-Hydro, Version 7.1. Please refer to Table 2 below for the offsite drainage area hydrology results.

Table 2: Offsite 1% Annual Chance (100-Year) Hydrology Results

Drainage Area ID	Watershed Area A (acres)	Runoff Coeff. C_w (dim)	Time of Conc. T_c (min)	Rainfall Intensity i (in/hr)	Runoff Supply Rate q (in/hr)	1% Annual Chance Peak Discharge (ft^3/s)
O- 1	4.03	0.65	9.8	7.97	5.2	**21**
O-2	5.72	0.64	1.4	6.67	4.3	**25**
O-3	7.99	0.64	13.4	6.88	4.4	**35**

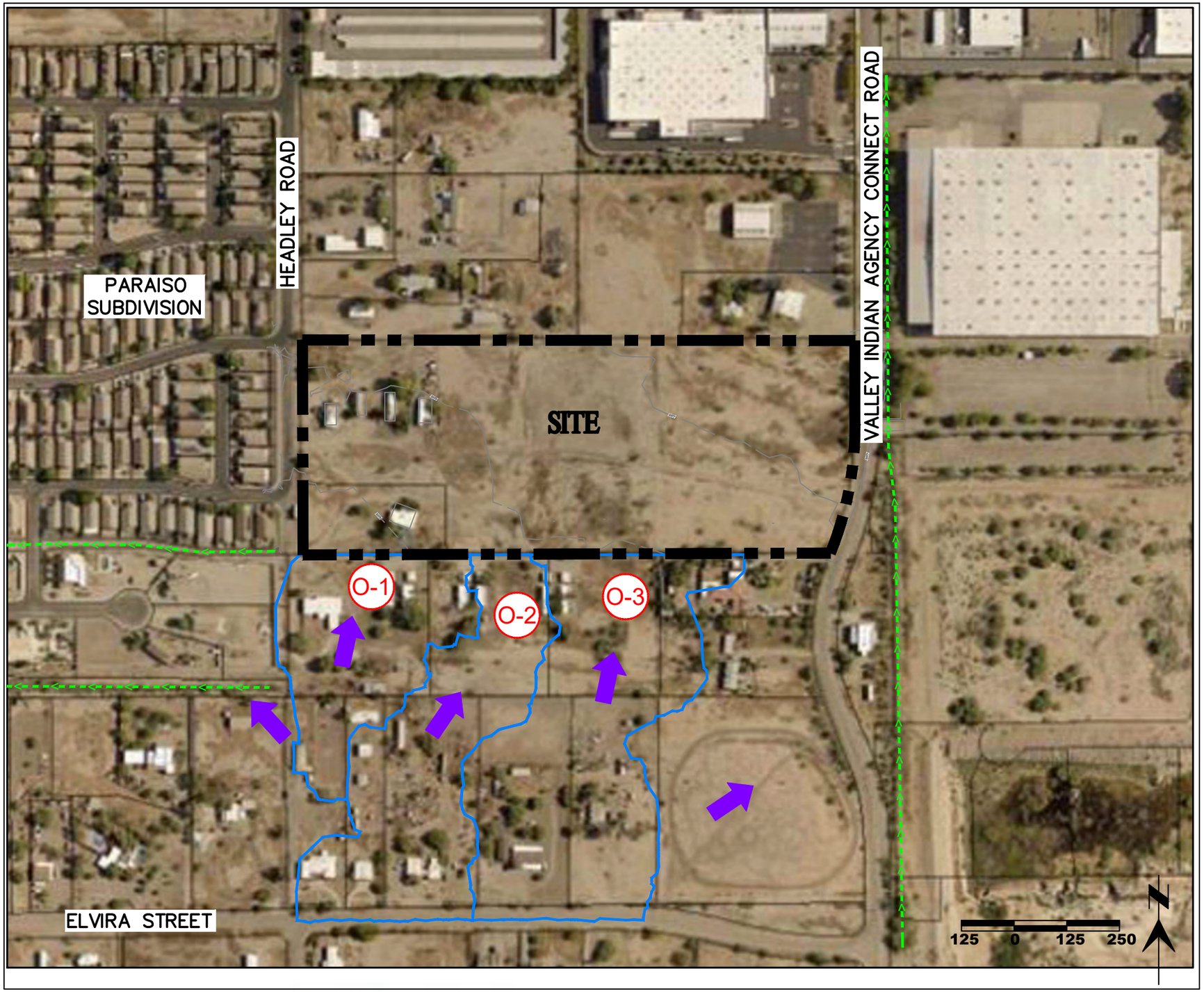
3c. Methodology to Determine Erosion Hazard Setbacks

Since there are no areas of concentrated flow on or adjacent to the site, no erosion hazard setbacks were determined. Erosion hazard setbacks in the proposed condition are not anticipated.

3d. Methodology to Determine 100-Year Floodplains

The onsite and offsite storm water impacting the site is characterized by sheet flow, and it is anticipated that all or most of this flow is less than 0.5 feet depth. As such, no regulatory floodplains were determined or mapped.

Exhibits to Follow



LEGEND

SITE — Rezoning Site

Direction of Surface Flows

Offsite Watershed Boundary

O-1 — Watershed Identifier

Existing Minor Off-Site Drainageways

Table 1. PC-HYDRO Results per Bowman

Sub-basin	Area (acre)	Peak discharge (cfs)		
		2-year	10-year	100-year
O-1	4.03	3.7	9.7	21.1
O-2	5.72	4.0	10.7	24.7
O-3	7.99	5.8	15.5	35.4

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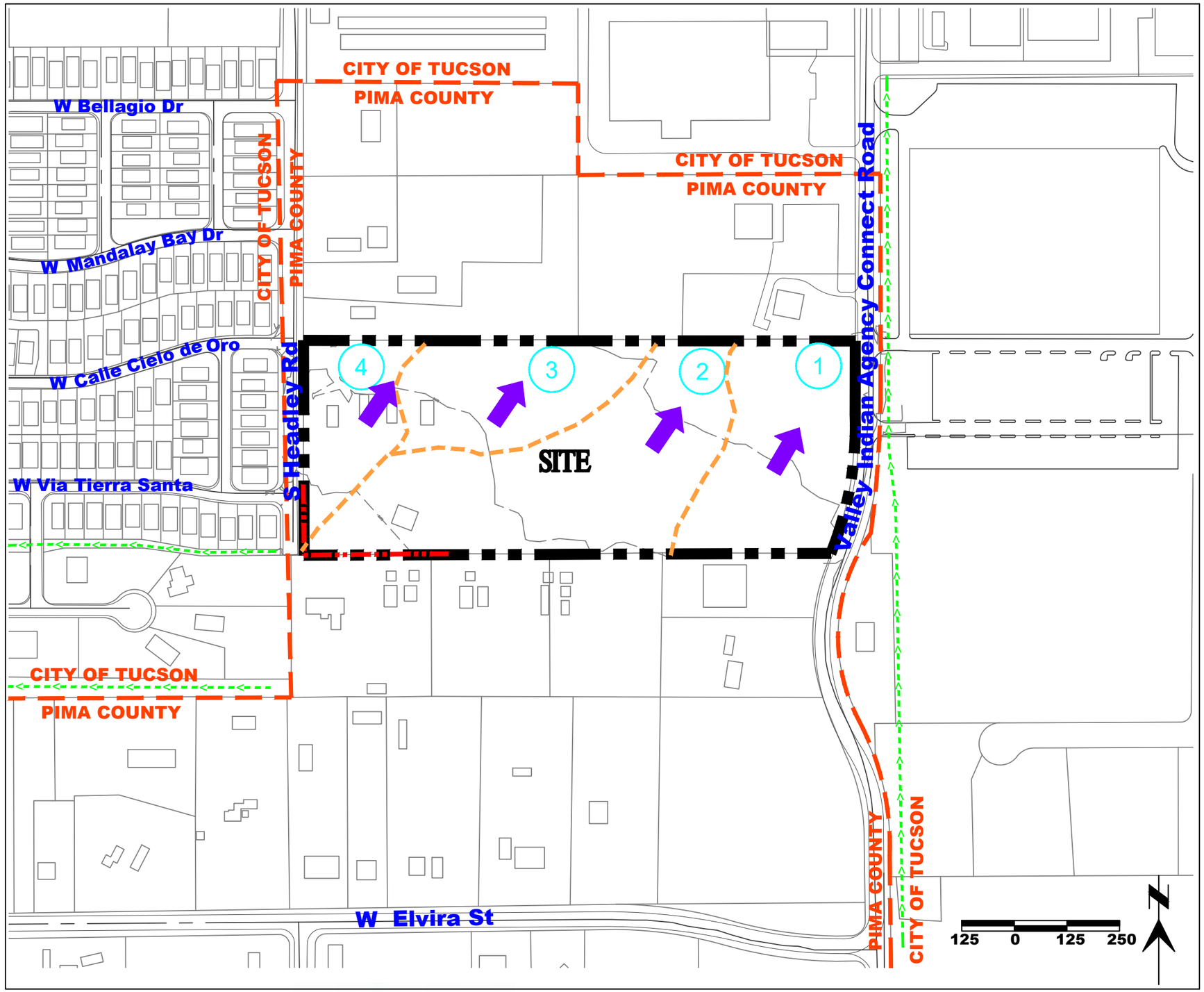
EXHIBIT I-C.1
OFFSITE HYDROLOGY



LEGEND

SITE — Rezoning Site

Topographic Contour Line (1' interval)

Direction of Surface Sheet Flows

Onsite Watershed Boundary

1 — Onsite Watershed Indicator

Existing Drainageway

NOTE: This site is subject to regulatory sheet flow.

Table 2. PC-HYDRO Existing Onsite Results per Bowman

SUB-BASIN	AREA (acres)	Peak Discharge (cfs)		
		2-year	10-year	100-year
(1)	1.97	2.3	5.8	12.7
(2)	2.78	3.1	7.9	17.2
(3)	6.44	4.5	12.7	29.0
(4)	3.86	3.7	9.8	21.2

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EXHIBIT I-C.2
ONSITE HYDROLOGY

D. BIOLOGICAL RESOURCES

1. Conservation Lands System

The entire site falls **outside of** the Maeveen Marie Behan Conservation Lands System (MMBCLS).

2. Priority Conservation Areas

There are no Critical Landscape Linkages on or near this property.

a. Pima Pineapple Cactus

The site is not designated as Priority Conservation Area (PCA) for the Pima Pineapple cactus. While it was not formally surveyed for same during our native plant inventory, none (0) were seen on the site during said inventory.

b. Needle-Spined Pineapple Cactus

No portion of the site is designated as Priority Conservation Area (PCA) for the Needle-Spine Pineapple Cactus. While it was not formally surveyed for same during our native plant inventory, none (0) were seen on the site during said inventory.

c. Cactus Ferruginous Pygmy Owl and Burrowing Owl

No portion of the site is designated as part of a Priority Conservation Area (PCA) for the Cactus Ferruginous Pygmy Owl. The site is part of a large region that is designated as PCA for the Western Burrowing Owl.

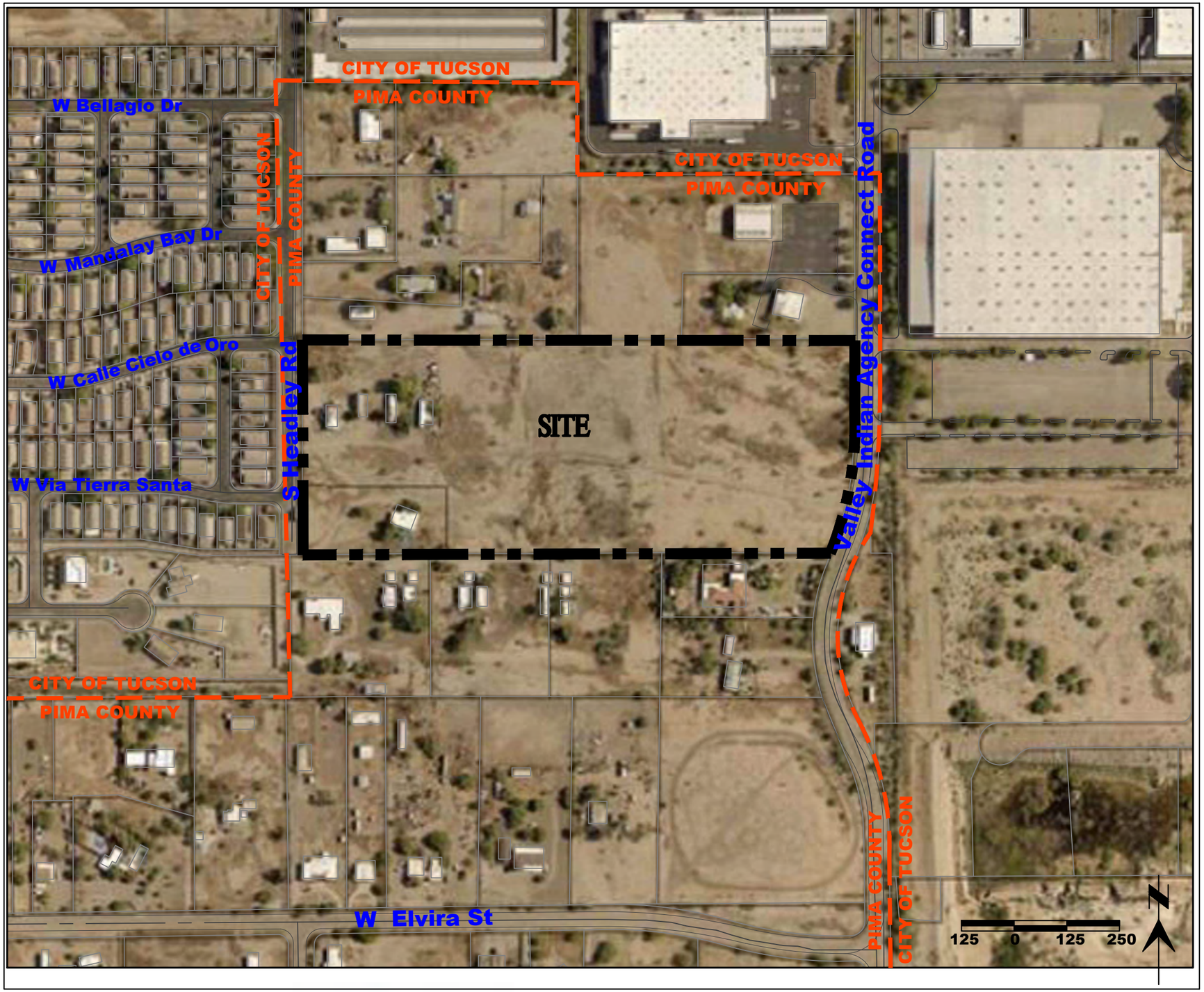
3. Saguaro and Ironwoods Inventory

The site was field-surveyed for saguaros and ironwood trees. None (0) exist on the property.

Due to significant prior grading and clearing, only a small number of remnant desert trees remain on the property. These will be dealt with on the Native Plant Preservation Plan (NPPP) provided at the time of our future subdivision plat.

4. Habitat Protection/Community Open Space

This property has never been identified by Pima County for acquisition under its habitat protection and community open space program. For all intents and purposes, this property possesses no environmental or habitat value due to clearing and disturbance by past agricultural activity and its present residential use.



LEGEND

SITE — Rezoning Site

NOTE:
This Property contains no (0) Ironwood Trees and no (0) Saguaros. This entire site has been cleared by past agricultural and residential activity.

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EXHIBIT I-D
SAGUARO / IRONWOOD INVENTORY
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E. TRANSPORTATION

A preliminary **Traffic Impact Study (TIS)** has been prepared for this rezoning by M. Esparza Engineering, LLC and is provided in Appendix "C" of this Site Analysis. This TIS addresses the impacts and particulars of the proposed 69-lot subdivision. A final, updated TIS will be provided at the time of future subdivision platting.

The narrative that follows here is per the *Pima County Site Analysis Guidelines* and should be considered as ancillary to the aforementioned TIS. With that in mind:

The subject property extends between S. Headley Road and Valley Indian Agency Connect Road, approximately thirteen hundred feet (1300') south of their respective intersections with W. Valencia Road, the lattermost of which is a designated "major street" on the *Pima County Major Streets & Scenic Routes Plan (MSSRP)*.

Please refer to Exhibit I-E.1 and Table 3 below for public streets within one (1) mile of the subject property. These streets are designated as follows by the Arizona Department of Transportation's (ADOT's) federal classification system:

- Valencia Road is classified as an "Urban Minor Arterial"
- Headley Road is classified as "Urban Minor Collector" south of Valencia Road and an "Urban Major Collector" north of Valencia Road
- Valley Indian Agency Connect Road is classified as an "Urban Minor Collector"
- Oak Tree Drive is classified as an "Urban Major Collector"
- Midvale Park Road is classified as an "Urban Major Collector"
- Mission Road is classified as an "Urban Minor Arterial"
- Los Reales Road is classified as an "Urban Major Collector" west of Mission Road; it is unclassified west of Valley Indian Agency Connect Road
- Calle Santa Cruz is classified as an "Urban Major Collector" north of Valencia Road.

1. Existing & Proposed Off-Site Streets

a. Existing Rights-of-Way

Existing right-of-way widths for the primary streets near the project are as follows: 1) Valencia Road has a total right-of-way width of one hundred fifty feet (150'); 2) Valley Indian Agency Connect Road, along the project's east frontage, is sixty feet (60') in width; and 3) Headley Road, along the project's west frontage, also has an existing right-of-way width of sixty feet (60').

No right-of-way dedications are anticipated with this project, as the TIS (provided in Appendix "B") indicates that no turn-lanes are required on the adjacent streets to serve the proposed development depicted on the *PDP.*

b. Number of Travel Lanes, Capacity & Posted Speed Limits

Valencia Road is a six-lane, curbed and divided arterial roadway with a posted speed limit of 40 MPH.

Valley Indian Agency Connect Road is a two-lane, uncurbed roadway with a posted speed limit of 40 MPH. Headley Road is a two-lane, uncurbed roadway with a posted speed limit of 25 MPH. Both of these streets have signalized intersections with W. Valencia Road.

With respect to capacity, Valencia Road is a Class I (40 MPH or greater, signalized) urban roadway with a calculated capacity (taking into account all applicable adjustments) of 53,910 daily trips for LOS "D".

Valley Indian Agency Connect Road is a Class I (40 MPH or greater, signalized) two-lane urban roadway. The capacity for this street (taking into account all applicable adjustments) is 16,727 daily trips for LOS "D" (just south of Valencia Road) and 12,744 daily trips (along the subject property's east frontage). These differing capacity figures are detailed in Exhibit 4 (p. 8) of the Preliminary TIS provided in Appendix "C"; they result from the fact that this street has turn lanes and through-lanes at the immediate Valencia intersection, while the street is a simple two-lane roadway along the project frontage, so it's capacity is slightly reduced.

Headley Road is a Class II (35 MPH or less, signalized) two-lane urban roadway with a calculated capacity (taking into account all applicable adjustments) of 13,986 daily trips for LOS "D" (just south of Valencia Road) and 10,656 daily trips (along the subject property's west frontage). The difference in capacity figures is due to the same reason described above.

These classifications and the ADT capacity figures are in accordance with the 2020 Florida Department of Transportation *Quality/Level of Service (QLOS) Handbook,* which is generally accepted by Pima County DOT as an industry standard, as well as with the preliminary TIS provided in Appendix "C".

c. Present Average Daily Trips (ADT)

Per the Preliminary Development Plan (PDP) presented in Section II.B of this Site Analysis, the proposed residential subdivision will generate less than 10,000 new vehicle trips. As such, Table 3 below provides the existing ADT volumes for those major streets within one (1) mile of the property.

Table 3 Follows Below

TABLE 3: ADT VOLUMES FOR MAJOR STREETS WITHIN ONE (1) MILE	
Street Name	**Average Daily Trip (ADT) Volume**
Valencia Road	46,371 Mission Road to Headley Road 47,680 Headley Rd. to Valley Indian Agency Rd. 48,988 Valencia Road to Midvale Park Road
Oak Tree Drive	7,580 North of Valencia Road
Valley Indian Agency Connect Road	7,484 Just South of Valencia Road 416 Adjacent to Rezoning Site
Headley Road	3,820 Immediately North of Valencia Road 3,484 Immediately South of Valencia Road 458 Adjacent to Rezoning Site
Midvale Park Road	10,365 North of Valencia Road No Count South of Valencia Road
Mission Road	8,269 Immediately North of Valencia Road 8,117 Immediately South of Valencia Road
Los Reales Road	8,448 West of Mission Road No Count Available West of Valley Indian Agency Connect Road
Calle Santa Cruz	No Count Available

- Also see the companion full Traffic Impact Study (TIS) submitted with this rezoning, as prepared by M. Esparza Engineering, LLC and dated October 19, 2022 (provided in Appendix "B"). Counts provided above are either: 1) 2021 or 2022 figures as per the Pima County Department of Transportation website, Pima Association of Governments (PAG) Transportation Management System, which have been adjusted to account for the Covid-19 pandemic so as to ensure that no "under-counting" is present in the above; or 2) volumes collected by Field Data Services of Arizona, specifically for this project, for Headley Road and Valley Indian Agency Collect Road the week of September 19, 2022; or 3) volumes estimated based on the recorded peak-hour volumes at the intersections and the recorded volumes on Valencia Road.

d. Existing Bicycle & Pedestrian Ways

Valencia Road features striped multi-use lanes that double as bicycle lanes on both sides of the street along the project frontage. Concrete sidewalks are also in place on the both sides of Valencia Road.

Valley Indian Agency Connect Road is an uncurbed street along the rezoning site's east frontage, with dirt shoulders, no bicycle lanes, and no sidewalks. Curbs and sidewalks are in place on the west side (only) of this street, beginning approximately four hundred feet (400') north of the subject site and continuing northward to W. Valencia Road.

Headley Road has curbs and sidewalks in place on the west side (only) of the street along the rezoning site's west frontage, continuing the entire length northward to W. Valencia Road. The east side of this street (along the project's frontage) has dirt shoulders, no bicycle lanes, and no sidewalks.

e. Public Roadway Improvements Underway or Planned

No planned roadway improvements are anticipated for the segment of Valencia Road north of the rezoning site. Long-term improvements to Valencia Road are envisioned for those segments lying west of Cardinal Avenue; no timetable or scope are yet set for same.

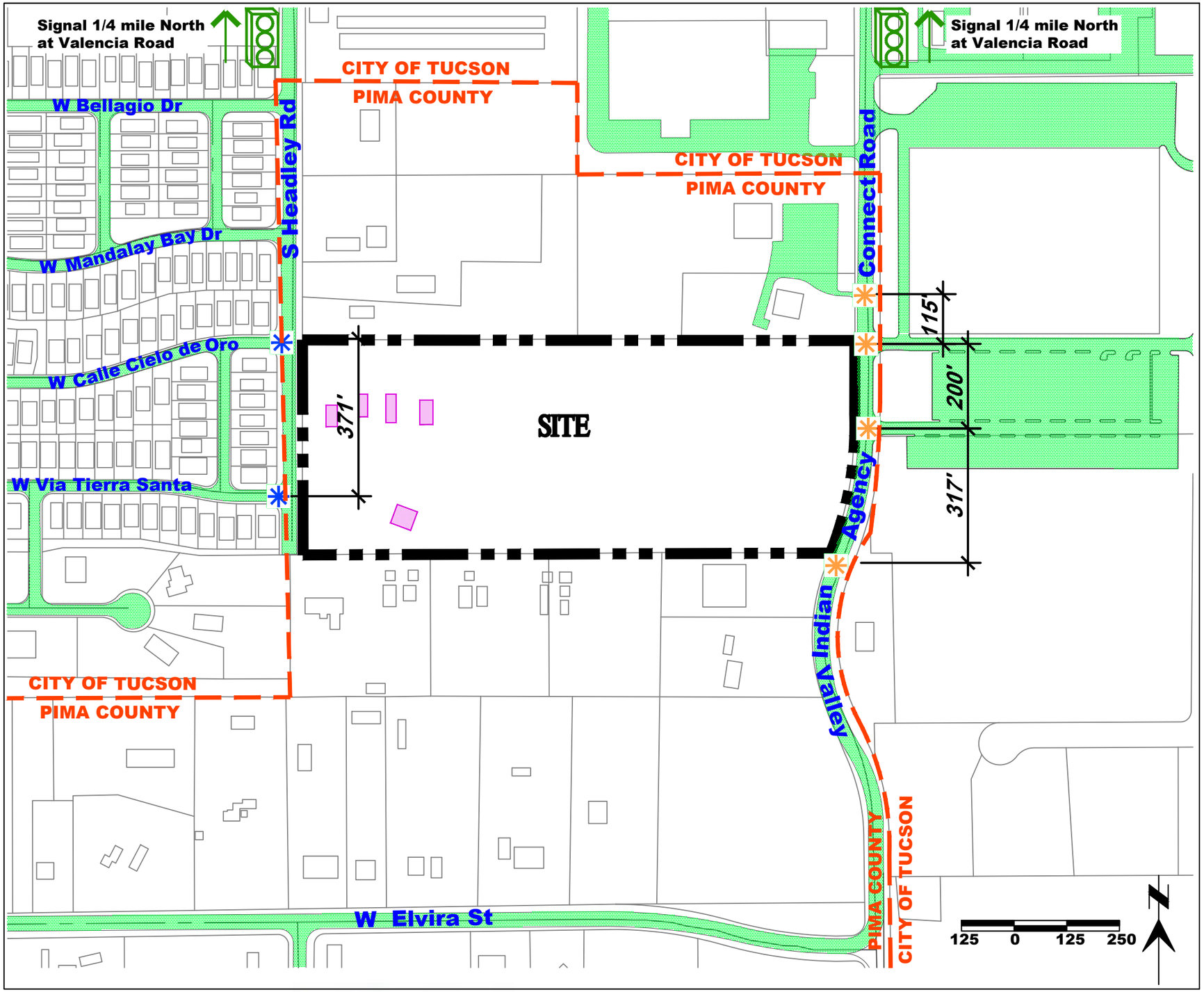
2. Distances from Site to Existing Nearby Driveways & Intersections

Nearby paved driveways and public street intersections in the vicinity of the subject property have been illustrated on Exhibit I-E.1 (Transportation Access). The PDP presented in Section II of this Site Analysis has been designed to align with existing driveway and street intersections on Headley Road and Valley Indian Agency Connect Road.

3. Existing & Planned Transit Routes

Existing Sun Tran Route No. 29, together with Sun Shuttle Route No. 440, operate on Valencia Road north of the rezoning site. This and the other routes in the vicinity have been illustrated on Exhibit I-E.2.

Exhibits to Follow



LEGEND

SITE — Rezoning Site

Public Street R.O.W. Line

Existing Pavement (Streets or Private Improvements)

Existing Structures (Manufactured Homes); to be removed

Existing Private Driveway Location

Existing Public Street Intersection

Signalized Intersection

10' — Approximate Distances between Intersections / Driveways

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Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT I-E.1
TRANSPORTATION - ACCESS
PAGE 19

LEGEND

- **REZONING SITE**
- **34** Sun Tran Route Indicator, Typ.
- **P** Park & Ride Lot
- #27 Sun Tran Route
- #29 Sun Tran Route
- #440 Sun Shuttle Route
- Existing Bus Stops (for Routes #27 and #29) Serving Rezoning Site

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EXHIBIT I-E.2
PUBLIC TRANSIT

F. SEWERS

1. Size & Location of Existing Sewers

The rezoning site benefits from a public gravity 8" sewer main (No. G-2000-046) located near the right-of-way of S. Headley Road, within the right-of-way of W. Calle Cielo de Oro; please refer to Exhibit I-F.

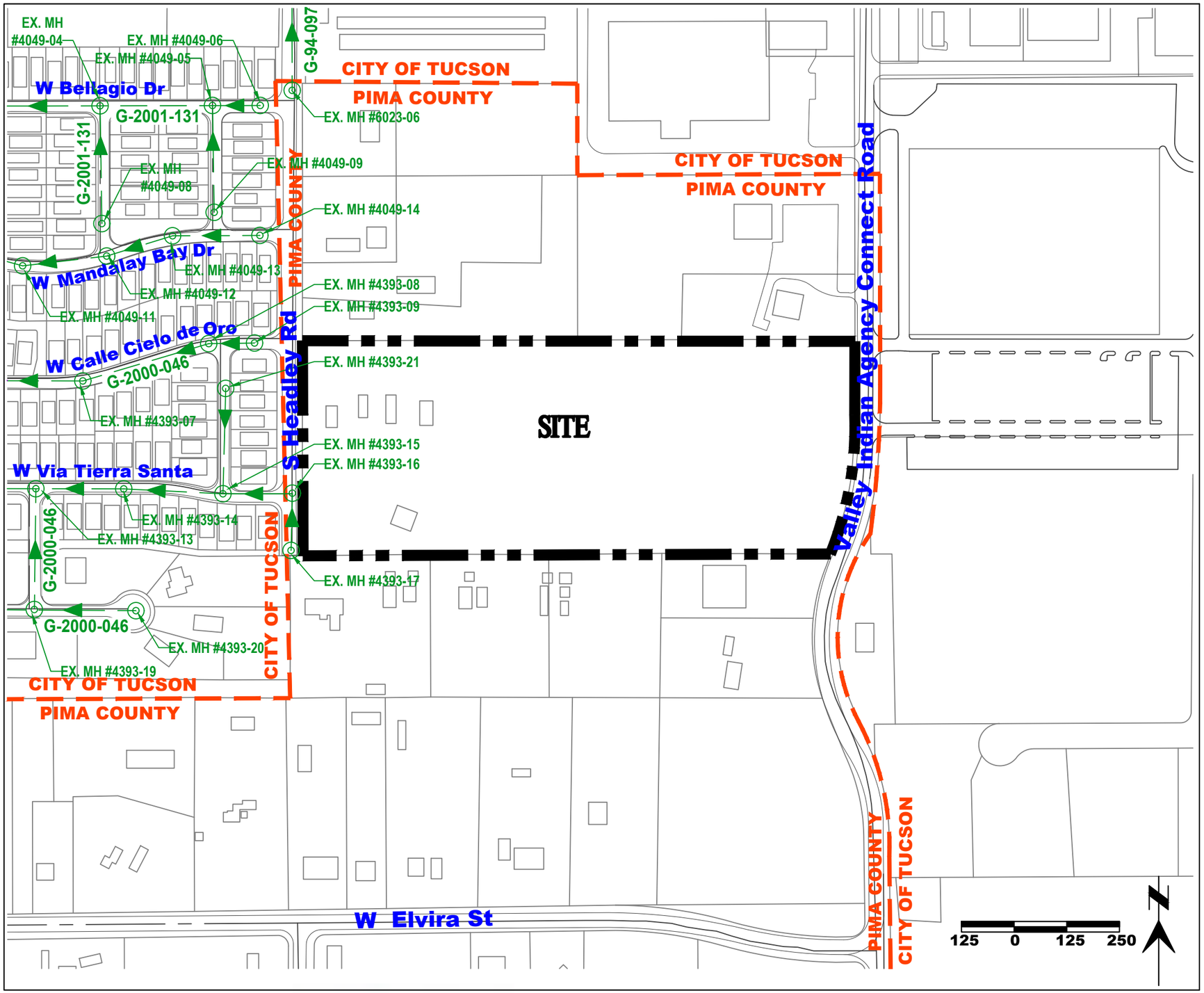
A formal Type I Capacity Response letter (No. P23WC00117) has been obtained from the Pima County Regional Wastewater Reclamation District (PCRWRD) and is presented in Section II.I (p. 54) of this Site Analysis.

2. Any Constraints to Gravity Service

Constraints to providing gravity sewer service for the proposed residential project are found in the inherent flatness of the property in its existing condition. There is insufficient natural fall across the site to gravity-drain it to the existing public sewer system in place west of Headley Road.

As such, a good portion of the site wastewater will drain to the northeast into a private pump station (constructed and maintained by the owner/developer), from which a force-main will extend to convey this collected wastewater westward, where it will ultimately drain via gravity into the aforementioned public system further west. This solution is discussed in more detail in Section II.I of this Site Analysis.

Exhibit to Follow



LEGEND

SITE — Rezoning Site

Existing Public Sewer and Flow Direction

G-84-002 — Sanitary Sewer Pipe Identification

EX. MH #4049-14 — Sanitary Sewer Manhole Identification Number

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EXHIBIT I-F
PUBLIC SEWERS

G. RECREATION & TRAILS

1. Public Parks, Recreation Areas & Trails within One (1) Mile

See Exhibit I-G for mapping of the various trails and park facilities located in the general vicinity of the rezoning site (none abut the property). These include: 1) the Santa Cruz River Park Trail #005 (part of the Huckelberry Loop) located approximately ¾ mile to the east; and 2) the designated Wentworth Road Trail #030, approximately ¼ mile west of the property. There are no direct connections between the subject site and either of these existing trails.

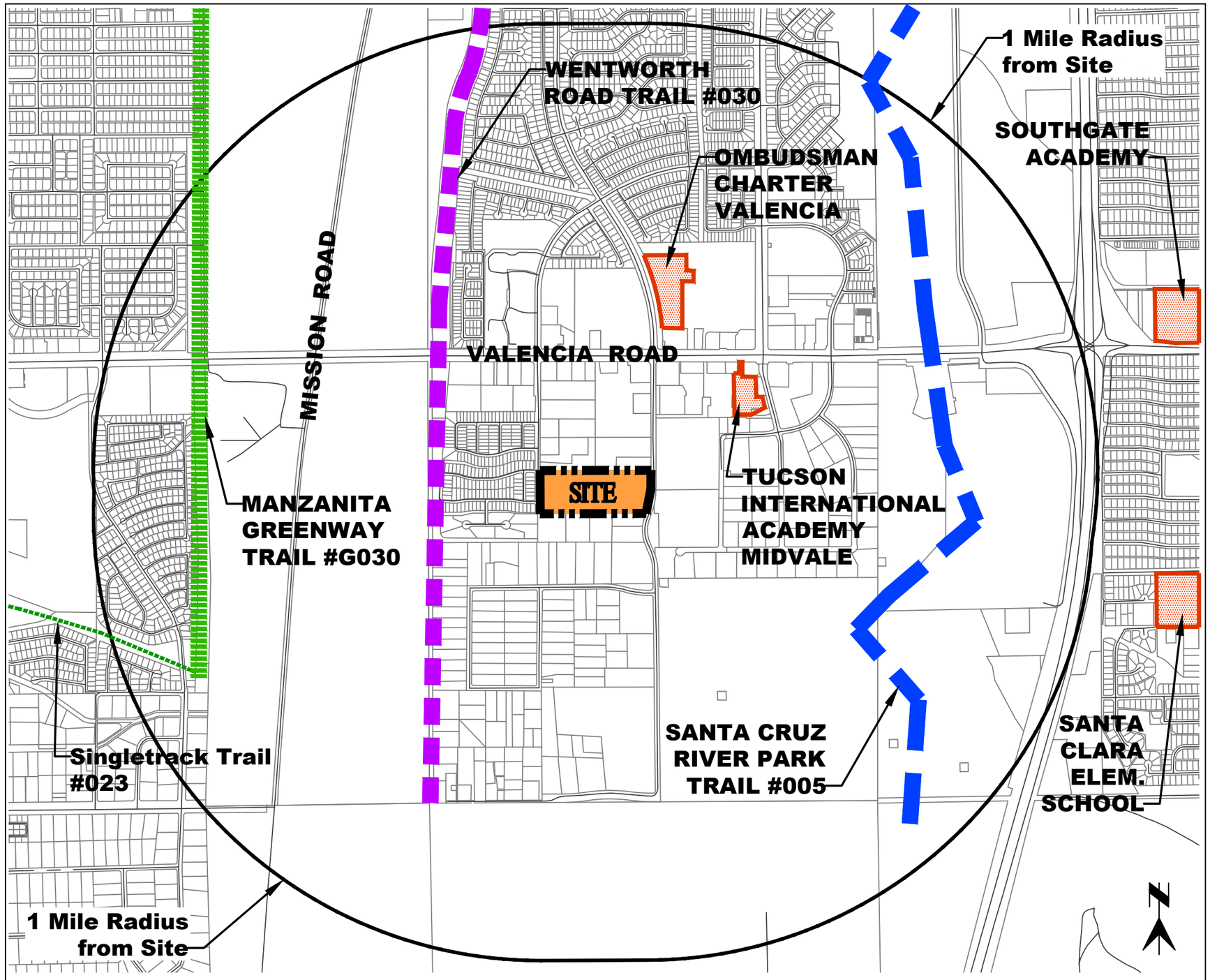
There are no public park sites located within one (1) mile of the property.

2. Trail Rights-of-Way

No on-site proposed or designated trail segments impact the subject property.

On-site private facilities, for both active and passive recreation, are proposed to serve its future residents. More explanation on this is provided in Section II.L of this Site Analysis.

Exhibit to Follow



LEGEND

- Rezoning Site (SITE)
- Designated Pima County Greenway Trail
- Designated Pima County Trail
- Designated Pima County River Park Trail
- Designated Pima County Singletrack Trail
- Public & Private Schools (Limited Athletic Facilities)
- Public Parks

Public Parks
No (0) Public Parks exist within one (1) mile of this rezoning site.

NOTE:
All above trails and trail heads are per the Pima Regional Trail System Masterplan; August 9, 2010.

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EXHIBIT I-G
RECREATION AND TRAILS

H. CULTURAL RESOURCES, ARCHAEOLOGICAL & HISTORIC SITES

1. Records Check and Letter Report

A *Class III Cultural Resources Survey* was completed for subject property by Tierra Right-of-Way Land Services Company in July, 2022. The *Survey* reviewed those existing records in the AZSITE, ASM Archaeological Records Office, and NRHP databases, which include records from the Arizona State Museum (ASM), Arizona State University, the Bureau of Land Management (BLM), and other sources. The *Survey* is included as Appendix "D" of this Site Analysis.

a. Prior Field Surveys

The above *Survey* indicates that one (1) survey within the project area was completed in 1995 as part of testing for Valley Indian Agency Collector Road. In addition, twenty (20) cultural resources have been recorded within one (1) mile of the property indicating the presence of artifacts.

b. Previously Recorded Archaeological or Historic Resources

See Appendix "C" for a detailed listing.

c. Probability of Buried Resources

Based upon the aforementioned past surveys within one (1) mile of the subject property, there is some possibility of buried resources on the site.

d. Recommendation as to Future Surveys

The above *Survey* contains a standard Discovery Clause, instructing the owner/developer as to proper procedures should cultural resources be encountered during the site development and construction process.

2. Survey Title

"Cultural Resources Class III Survey of 15.3 Acres at 6765 South Headley Road, in Tucson, Pima County, Arizona."

I. COMPOSITE MAP

1. Description of Major Characteristics

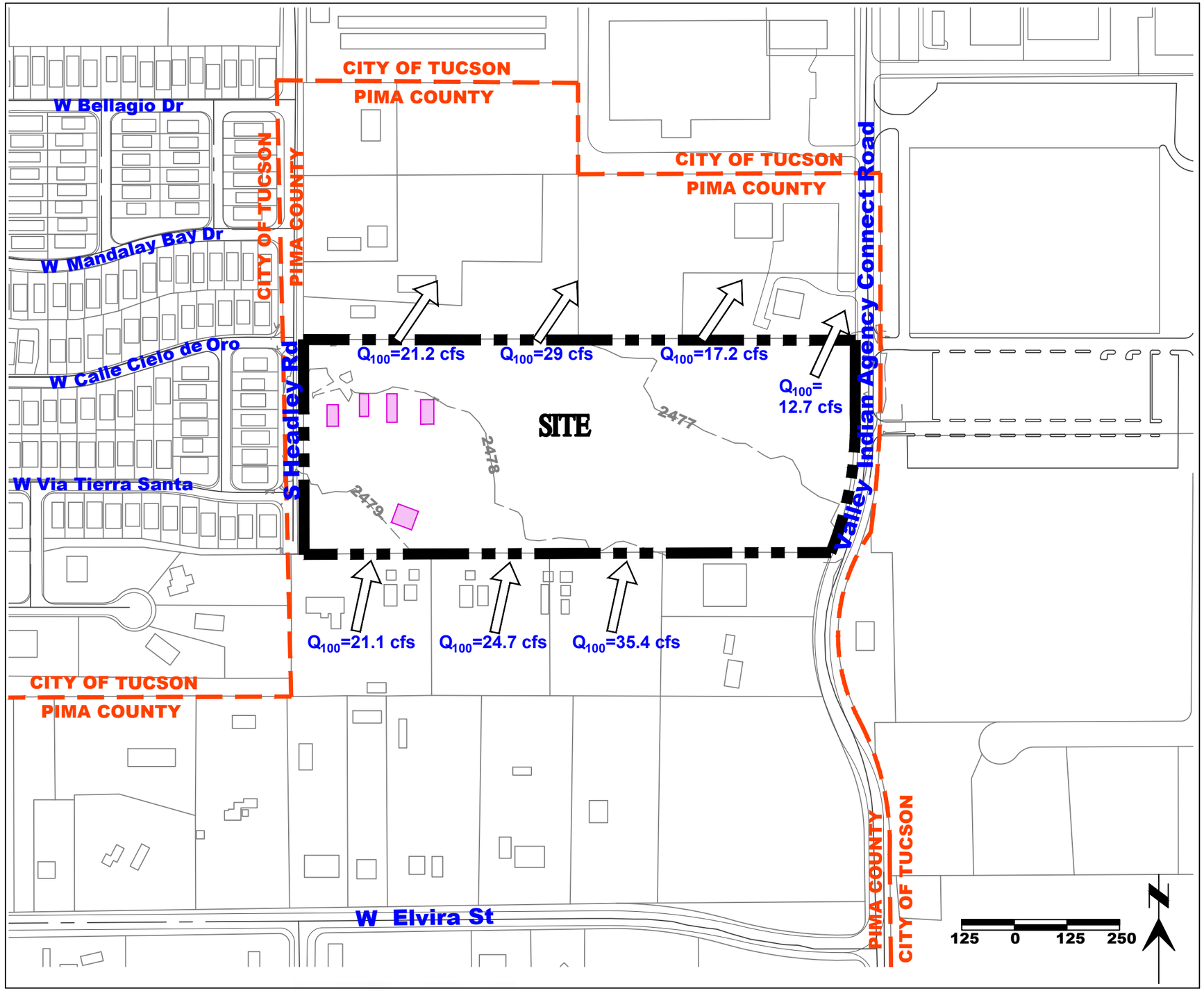
The site is wholly unremarkable in terms of landform or significant features and has been wholly disturbed by historical agricultural activity and its current residential use. Those few characteristics in the Site Analysis Guidelines that are relevant to the site are illustrated on Exhibit I-I (Composite Map) as follows:

1. **Topography.** There are no restricted peaks and ridges, 15% slopes, rock outcrops, or talus slopes on the property. As such, none of these topographic features are depicted on the Composite Map exhibit. The Exhibit will contain only the 1' contour interval mapping of the site.

2. **Hydrology.** Only non-regulatory sheetflow volumes impact the property. As such, the Composite Map exhibit contains the following identified items from the checklist: (d) sheet flood areas (essentially the entire site). Incoming and outgoing volumes, although non-regulatory, are shown.

   The following items from the checklist do not exist on the property and so will not be depicted on the Composite Map: (a) the 100-year regulatory floodplains traversing the site in the existing condition; (b) erosion hazard setbacks; (c) concentration points and 100-year volumes entering and leaving the site; (e) regulated riparian habitat; and (f) lakes, ponds, springs.

3. **Biological Resources.** The Composite Map exhibit contains no (0) items from the checklist, and so the following will not be depicted on the Composite Map: (a) all saguaros, mapped and categorized by their appropriate height category; (b) ironwood trees; (c) pima pineapple cactus; (d) needle-spined pineapple cactus; and (e) areas in which disturbance is prohibited by an adopted Pima County ordinance or policy.



LEGEND

SITE — Rezoning Site

Existing Condition Topographic Contour (1' Interval)

Q_{100}=29 cfs — Existing Sheet Flow Quantities Entering / Exiting the Site

Existing Structures (Manufactured Homes); to be removed

NOTES:

1. This entire site has been disturbed by past activities.
2. This site contains no (0) slopes of 15% or greater.
3. This site contains no (0) regulatory floodplains.
4. This site is subject to regulatory sheet flow.

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REZONING: SH to CR-5

EXHIBIT I-I
COMPOSITE MAP

SECTION II:

Land Use Proposal

A. PROJECT OVERVIEW

The rezoning site is located between S. Headley Road and S. Valley Indian Agency Connect Road, approximately ¼ mile south of W. Valencia Road. Most of the surrounding uses within this portion of the Valencia Road corridor fall within the City of Tucson, including a large shopping center with commercial goods and services, three (3) existing single-family residential subdivisions, and a park-industrial warehouse use (currently vacant; to the immediate east).

To the immediate north and south of the rezoning site are properties still within unincorporated Pima County, these being comprised of manufactured-home residences, site-built residences, and the Midvale Christian Center. This small "peninsula" of unincorporated land is adjoined on three sides by the City of Tucson.

The subject rezoning property presently contains several manufactured-home residences; these will be removed with the proposed project. The site has been almost totally graded and cleared by past agricultural activity. There is very little significant vegetation of any note still remaining.

1. Proposed Zoning Boundaries

The proposed rezoning request is comprised of two (2) existing tax parcels, these being Nos. 138-24-0310 & 0320, encompassing 15.1 acres in gross area.

2. Project Description

a. Proposed Development Use & Type

The intent of this rezoning is to develop the property as a single-family residential subdivision that is generally consistent in type and density to the existing Valencia Place and Paraiso residential neighborhoods already in place to the immediate west within the City of Tucson. As such, the proposed project will contain both one-story and two-story residences, in response to market demand. In keeping with the property's *MLIU (Medium-Low Intensity Urban)* density ceiling, the proposed subdivision will contain less than five (5) residential units per acre. See Section II-A.2.c below.

b. Proposed Development Response to Opportunities & Constraints

There are no material physical constraints on this property, other than its extreme flatness. This requires the use of fill material to raise certain portions of the site to allow for positive drainage, the proper handling of storm run-off, and gravity-sewer needs.

There is little existing remnant vegetation of any material value, in that the property has been 100% disturbed by past agricultural activity and its present rental residential manufactured homes. The site and surrounding area lie wholly outside of the Conservation Lands System.

There is one regulatory constraint impacting the property, this being the fact that a portion of its southern half falls within Use Restriction Zone "C" of the San Xavier Historic Mission Zone per Section 18.63.100. The affected portion of the site is delineated on Exhibit II.B (Preliminary Development Plan). Zone "C" prescribes certain development standards and limitations on density; the proposed subdivision will fully comply with these.

c. Conformance with Comprehensive Plan, etc.

This Project complies with its Designated Land Use Intensity Category.

Pima Prospers designates the rezoning site as *Medium-Low Intensity Urban (MLIU)*, which is a residential category that prescribes a maximum density of five (5) units per acre. The subdivision depicted on Exhibit II.B (Preliminary Development Plan) illustrates a subdivision with sixty-nine (69) homes and a resultant gross density of 4.6 residential units per acre (RAC).

Furthermore, the Project complies with the County's Pima Prospers Use of Land (Chapter 3) and Physical Infrastructure Connectivity (Chapter 4) policies.

The pertinent policies are as follows: Land Use Element (Section 3.1), Environmental Element (Section 3.4), Community Design Element (Section 3.5), Transportation Element (Section 4.1), and Cost of Development (Sections 7.1 & 7.2). These are each discussed below:

Land Use Element (Section 3.1)

The proposed project works toward the established Goal 1 objective (p.3.2) of integrating land use with existing physical infrastructure to ensure long-range viability of the region. The requested rezoning and residential use integrates with the existing transportation, wastewater, potable water, and utilities resources already convenient to the property. It represents a reasonable and prudent extension of the existing residential urbanization pattern and, as such, will be effectuated off of the existing network of infrastructure rather than requiring any further outward expansion of it.

Environmental Element (Section 3.4)

The rezoning property lies wholly **outside of** the Maeveen Behan Conservation Lands System (CLS), as does essentially the entire larger urbanized area around it. Furthermore, the majority of the property has already been disturbed/impacted by prior agricultural and residential activities. As such, approval of this rezoning request and the future development of the property as intended will have no negative impacts upon any valuable biological resources, nor will it be in conflict with any adopted environmental policies contained within Pima Prospers.

Housing and Community Design Element (Section 3.5)

The proposed rezoning furthers the Goal 8 (p. 3.45) objective of providing new development that is generally compatible and scale-appropriate, as well as the Goal 10 (p. 3.46) objective of ensuring development that reflects the dominant character and sense of place of its given area. This project is guided by the simple goals of: 1) providing a single-family residential use that mirrors that already established to its immediate west; 2) growing the residential population so as to further support transit demands and the commercial uses and already nearby; and 3) responsibly co-existing with our surroundings by suitably buffering and respecting the lower-density residences that exist to the immediate north and south.

Transportation Element (Section 4.1)

The proposed rezoning furthers the Goal 1 (p. 3.45) objective of promoting a comprehensive and multi-modal transportation system. The Valencia Road already enjoys Sun Tran service via several established routes. Multi-modal objectives are always furthered by fostering the continued intensification and residential densification of such areas. Continued population growth through new residential projects such as the one proposed will contribute further towards the goal of ensuring that critical mass of population which is needed to support a multi-modal, transit-rich corridor.

Cost of Development (Sections 7.1 & 7.2)

The proposed rezoning furthers the principles of Section 7.1 and the *Goals and Policies* of Section 7.2 to achieve fairness in public infrastructure funding and to ensure that all new development pays its appropriate fair-share of same. The proposed project will assume the design and construction cost of all new public infrastructure necessary to serve its new residences. Furthermore, it will contribute to the funding of prioritized regional public transportation improvements through its payment of impact fees in accordance with the Department of Transportation's (DOT's) impact fee program.

d. Interactions With Surrounding Property Owners

Per the Pima County GIS, there are no registered neighborhood associations in the vicinity of the proposed rezoning. Private homeowners associations (HOA's) exist within the Valencia Place and Paraiso subdivisions within the City of Tucson to the immediate west.

The subject rezoning site went through the comprehensive plan amendment process in 2022, at which time appropriate interactions occurred with the surrounding unsubdivided property owners and the aforementioned subdivisions. At that time, little interest was expressed in the request and no members of the public ever comment on the request nor appeared at the Planning & Zoning Commission or Board of Supervisor public hearings.

With this rezoning request, new public notices will be sent all property owners within the statutory notice area inviting them to a formal, in-person neighborhood meeting. The results of that meeting and all other direct neighbor interactions will be documented and provided to staff as the rezoning process moves forward.

e. Impact on Existing Land Uses in the Surrounding ¼ Mile Area

Development of the proposed rezoning site as intended is a density-appropriate expansion of the emerging urbanized residential character that already established to the immediate west. Special care must be given to the treatment of project's northern and southern boundaries to appropriately respect the existing lower-density residences in place there. The submitted *Preliminary Development Plan (PDP)* in Exhibit II-B provides for an appropriate bufferyard treatment along these boundaries. Due to the limited prospects for salvage of existing on-site tree specimens, nursery stock will be used to effectuate a suitable appearance in a reasonable timeframe.

f. Contribution to Smart Growth Principles

The proposed rezoning request is consistent with several of the Smart Growth Principles as identified by the Smart Growth Network (SGN). These are individually addressed below.

Multi-Modal Transportation Opportunities

The continued urbanization, commercialization and residential growth of the Valencia Road corridor will make a material contribution towards regional opportunities for multi-modal transportation. Valencia Road is already served by several Sun Tran routes. Robust multi-modal opportunities throughout our transportation system demand a stable, densified population that can only be achieved through continued residential development such as that which is proposed here. The proposed rezoning request makes a material contribution toward the level of densification necessary to grow our population base to justify further expanded transit and multi-modal services.

Take Advantage of Compact Building Designs

In the global perspective, this proposed rezoning does not "leap frog" into otherwise isolated areas, but instead helps infill an established mix of existing single-family residential and non-residential uses already in close proximity to the site. In doing so, it furthers a compact spatial arrangement of urbanization and materially fosters an intelligent and practical expansion of the growth pattern for the area that is currently well underway.

Rational Infrastructure Expansion and Improvements

Intelligent and efficient regional growth demands the intelligent and efficient use of established public infrastructure. Given that the proposed rezoning is contiguous to an established urbanizing area, the rezoning site is

developable using the existing framework of public infrastructure that is already in place and project-convenient. No significant system expansions or augmentations are necessary to serve it.

Conservation of Natural Resources

The rezoning site lies wholly **outside of** the Maeveen Behan Conservation Lands System (CLS). In addition, the majority of the property has already been significantly disturbed and impacted by prior grading and the existing residential activities on the site. Approval of this rezoning and the future development of the property as intended will have no negative impact upon any valuable biological resources nor be in conflict with any adopted environmental policies contained within Pima Prospers.

3. Compliance with the Pima County Zoning Code

At the time of this writing, we anticipate that there is no portion of the Pima County Zoning Code which we cannot comply with in the ultimate design and construction of this project. In the event that any such particulars arise during final engineering and site development permitting, these will be appropriately dealt with through staff interactions and any attendant processes (e.g. variances) that might be required.

B. PRELIMINARY DEVELOPMENT PLAN (PDP)

1. PDP Map and Overlay -- General Description

A Preliminary Development Plan (PDP), in accordance with Section II-B.1a-p of the Site Analysis Checklist, is provided as Exhibit II-B. This PDP illustrates a single-family residential subdivision containing sixty-nine (69) lots, together with common areas for drainage, landscape buffering and recreation. The project will proceed as a single phase.

2. Support Data

The following support data is provided below and is also reflected in notes on the PDP as appropriate:

a. Estimated Floor Area of Structures.

This is a residential subdivision. Home sizes will likely be in the range of 1,500 to 2,500 square feet.

b. Building Heights

All structure heights will be in accordance with the maximum building height of the CR-5 zone (i.e. thirty-four feet; 34'). That portion of the property lying within Zone "C" of the San Xavier Mission Historic Zone will be limited to a building height of thirty feet (30') and two stories.

c. Number of Dwelling Units

Sixty-nine (69) individual residential lots are proposed.

d. Maximum & Minimum Residential Densities

The maximum allowed density is five (5) units per acre (RAC). This rezoning proposes 4.6 RAC.

e. Type of Landscaping

Landscaping will be a mixture of native desert and xero-riparian trees, shrubs and groundcovers. The overall landscape program for the site is addressed in Sections II.E (Biological Resources) and II.F (Landscape & Buffer Plan). Landscaped buffers will largely utilize nursery stock due to the extremely limited prospects for salvage and transplantation on this particular property.

f. Size & Description of Recreation Areas, Natural/Functional Open Space

On-site, private recreational facilities will be provided for the proposed residential neighborhood and are discussed more fully in Section II.L of this Site Analysis. These amenities will include traditional developed recreation (e.g. a ramada, barbeque area, children's play area), active fitness facilities (jogging path, exercise stations), a passive/contemplative garden area, and a dog park. All of these are community-fostering improvements designed to enhance the social fabric of the neighborhood.

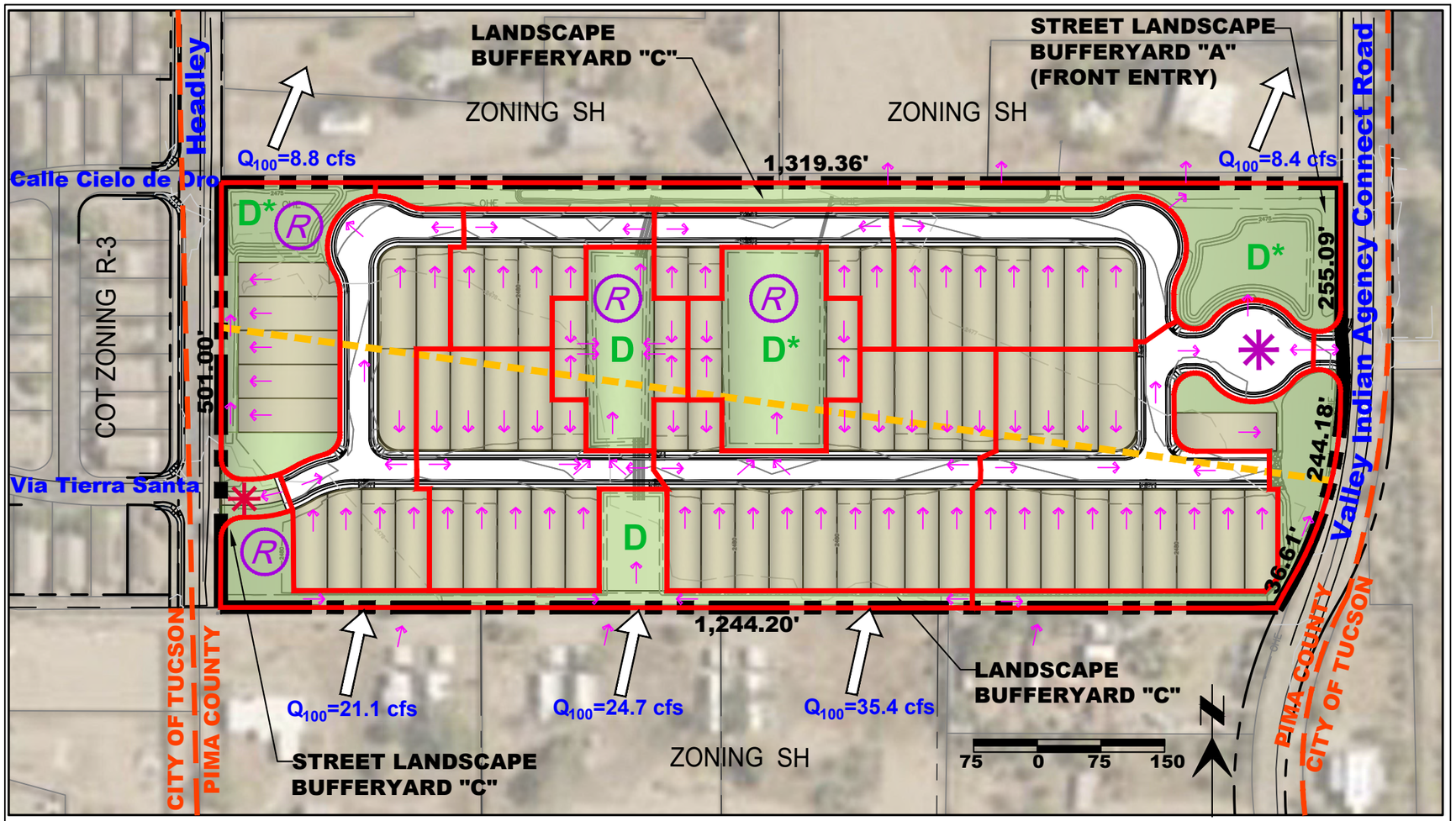
Final square footages of the developed recreation areas and all design particulars will be provided on the Recreation Area Plans (RAP's) provided at the time of future subdivision platting.

The remaining functional and passive open space will be comprised of: 1) desert landscaping that will occur in the perimeter buffers, detention basins, and in common-area pockets throughout the project; and 2) the small private yards provided for each individual home.

In accordance with Pima Prospers Section 4.8 (Goal 1, Policy 3.e) and Section 4.10 (Goal 1, Policy 2.e), sidewalks will be provide along the on-site private streets to ensure internal connectivity, as well as linkages to the adjacent rights-of-way of both Headley Road and Valley Indian Agency Connect Road.

g. Other Supplemental Information – Safe Streets

In keeping with the objectives of providing safe streets to schools, all new streets within the proposed community will provide concrete sidewalks, such that there is a continuous pedestrian system throughout the neighborhood and extending to the adjacent public street right-of-way.



LEGEND

- PDP/Rezoning Boundary
- 1,319.36' — Boundary Dimension, Typ.
- Northern Limit of San Xavier Mission Historic Zone "C"
- D* — Proposed Detention Basin; those denoted with an asterisk (*) will provide necessary first-flush retention volume.
- Q_{100}=8.8 cfs — Post-Development Flow Quantities and Concentration Points Entering or Exiting the Site (See Exhibit II-D.1 for further detail)
- Surface Flow Direction
- Post-Development Watershed Boundaries
- Project Main Entry & Exit (Gated, with Turnaround)
- 16' Emergency Access Only with Stabilized Drivable Surface (Cable or Gate Barrier)
- R — Recreation Areas - See Exhibit II-L for specific uses.
- Storm Drains

GENERAL NOTES

PROJECT AREA

ASSESSORS PARCEL NUMBERS:	138-24-0310 & 0320
OVERALL REZONING SITE GROSS AREA:	15.1 AC
NET SITE AREA AFTER R.O.W. DEDICATIONS:	SAME (NO R.O.W. DEDICATIONS REQ'D)

PROJECT PARTICULARS

EXISTING ZONING:	SH
COMPREHENSIVE PLAN DESIGNATION:	MLIU
PROPOSED ZONING:	CR-5

PROPOSED USE

A SINGLE-FAMILY DETACHED RESIDENTIAL SUBDIVISION CONTAINING APPROXIMATELY SIXTY-NINE (69) LOTS. TYPICAL LOT SIZES ARE 35' X 120' (4,200 SF) AND 40' X 120' (4,800 SF).

PHASING

THE PROJECT WILL BE COMPLETED IN A SINGLE PHASE.

BUILDING HEIGHT

MAXIMUM RESIDENTIAL HEIGHT IS THIRTY-FOUR FEET (34'). THAT PORTION OF THE PROJECT WITHIN THE SAN XAVIER MISSION HISTORIC ZONE IS LIMITED TO A MAXIMUM HEIGHT OF 30'. PROJECT WILL CONTAIN BOTH 1-STORY AND 2-STORY RESIDENCES PER MARKET DEMANDS.

PARKING & LOADING

PARKING AND LOADING WILL BE IN ACCORDANCE WITH SEC. 18.75 (PARKING & LOADING STANDARDS). ON-STREET PARKING WILL BE ALLOWED. FINAL DESIGN AND COMPLIANCE WITH CODE WILL BE DEMONSTRATED AT THE TIME OF FUTURE RESIDENTIAL SUBDIVISION PLAT REVIEW.

RESIDENTIAL SUBDIVISION PUBLIC STREETS

PROPOSED RIGHT-OF-WAY WIDTH:	45'
TRAVEL LANES:	MINIMUM TWO (2) 12' LANES
CURBING:	2' WEDGE CURBS ON BOTH SIDES
SIDEWALKS:	5' SIDEWALKS ON BOTH SIDES WHERE LOTS ABUT BOTH SIDES OF THE STREET
ON-STREET PARKING:	ALLOWED BOTH SIDES

REQUIRED PERIMETER LANDSCAPE BUFFERS

HEADLEY ROAD STREET FRONTAGE:	BUFFERYARD "C"
VALLEY INDIAN AGENCY CONNECT RD:	BUFFERYARD "A"
NORTHERN & SOUTHERN BOUNDARY:	BUFFERYARD "C"

REGULATED RIPARIAN AREA

THERE IS NO REGULATED RIPARIAN AREA WITHIN THIS DEVELOPMENT.

CONSERVATION LANDS SYSTEM (CLS) PARTICULARS

THE ENTIRE PROJECT LIES OUTSIDE OF THE MMBCLS.

LOW IMPACT DEVELOPMENT PRACTICES

LID PRACTICES WILL BE INCORPORATED INTO THE FINAL DESIGN THROUGH WATER HARVESTING AND LIMITING RETAINED DEPTHS; SEE SECTION II.D.1.e OF THE SITE ANALYSIS.

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-B.1
PRELIMINARY DEVELOPMENT PLAN
PAGE 34

C. TOPOGRAPHY & GRADING

Please refer to Exhibit II.C (Topography and Grading) for an illustration of the conceptual grading and basic design features of the proposed development. This is a 100% mass-graded project. Also refer to Appendix "E", wherein a detailed plan of grading and cut/fill areas is provided for supplemental purposes.

1. Development Features on Slopes of 15% or Greater

No (0) slopes of 15% and greater (as defined by the *Site Analysis Guidelines* checklist) exist on this property.

2. Natural Areas Used for HDZ Allowances

There are no areas being set aside as natural open space for the purposes of average cross slope or HDZ calculation on subject property. The site's average cross-slope calculation (as provided in Section I.B of this Site Analysis) is less than 1%.

3. Disturbed, Revegetated and Natural Areas

The site is characterized by the following topography/grading facts:

a. Natural Open Space

No natural open space remains on the property, as the entire site was disturbed by past/historical agricultural use of the property, as well as by its current use for rented manufactured homes.

b. Revegetated Areas

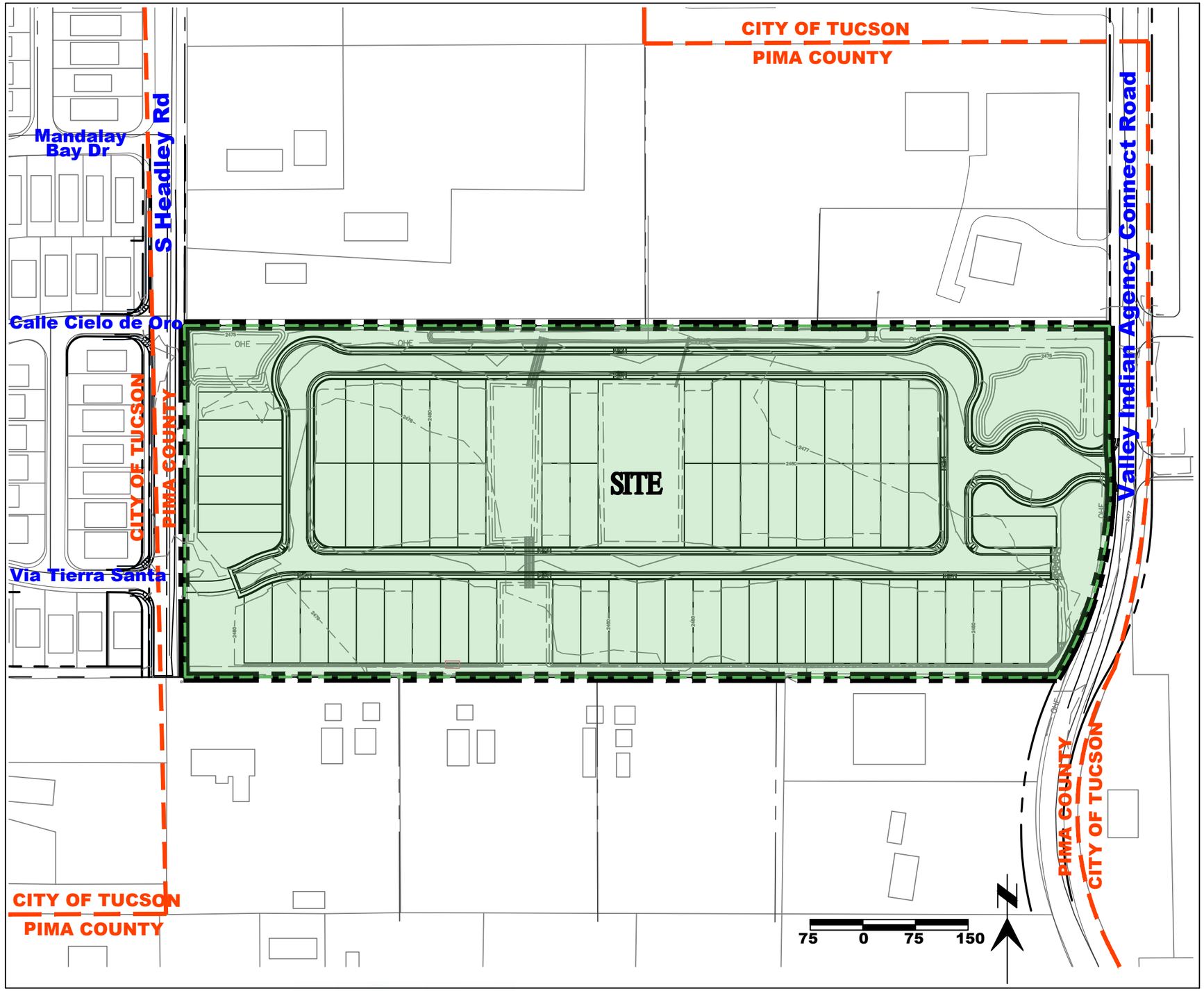
Landscaping will occur in those areas designated on the *PDP* as perimeter buffers, detention basins, other drainage areas, and recreation areas.

c. Graded/Disturbed

The entire 15.1-acre site (100%) will be graded; Exhibit I-C provides a schematic illustration of same. All common areas, basins, landscape borders, and private recreation areas will planted with nursery stock.

4. Maximum Grade Change; Areas By More than 5' of Cut or Fill

The site is very flat with few undulations; there are no (0) areas where grading cuts and/or fills will exceed five feet (5') from existing grade. Refer to Appendix "E" for more detailed proposed grading information.



LEGEND

SITE — Rezoning Site

Existing Condition Topographic Contour (2' Interval)

Proposed Graded Area (Entire Site)

Existing Structures (Manufactured Homes); to be removed

NOTES

1. This entire property has been graded and disturbed by prior agricultural uses and its current residential occupation.
2. The proposed project will grade 100% of the property for the new streets, private home lots, retention/detention basins, and related subdivision improvements.
3. No areas of the post-development project will be filled or cut five feet (5') or more.
4. A detailed grading plan and cut/fill analysis is provided in Appendix E for informational purposes.

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REZONING: SH to CR-5

EXHIBIT II-C
TOPOGRAPHY & GRADING

D. HYDROLOGY

The proposed development is a residential subdivision of single-family, detached homes as described in narrative Section II-B above and as depicted on Exhibit II-B and Exhibit II-D.1 (Proposed Hydrology). Please refer to the latter in conjunction with the following:

1. Post-Development On-Site Hydrology

a. Washes To Be Left Natural

There are no areas of concentrated flow on the project site, and so there are no natural washes being preserved. The nearest defined wash or channel is the offsite Oak Tree Channel on the east side of Valley Indian Agency Connect Road. Storm water conveyance through the site will be accomplished with a proposed network of constructed basins. These basins will serve as traditional retention/detention areas, as well as facilitating storm water conveyance around and through the site for both onsite and offsite storm flows.

b. Regulatory Floodplains

There are no existing regulatory floodplains on, or adjacent to, the project site – neither Federal nor local. As such, improvements associated with the proposed development will not encroach into any regulatory floodplains.

c. Erosion Hazard Setbacks

There are no areas on, or adjacent to, the project site that include erosion hazards or erosion hazard setbacks. Although the post-development condition of the project site may include some erosion protection measures, erosion hazard setbacks are not anticipated to be created as a result of development.

d. Pima County Regulated Riparian Habitat

There is no mapped or regulated riparian habitat at or near the project site. As such, no mitigation for riparian habitat is anticipated as part of this development.

e. Proposed Drainage Structures

The property is being developed as a residential subdivision, which will contain approximately 67 lots with common areas consisting of open areas, retention/detention basins, and utility easements. Typically, the lots will be front-draining into the new local streets, with lot drainage being conveyed and accumulated within these streets. In a few instances, there will be rear-draining lots. Drainage runoff from these lots will also be conveyed within the street sections to scuppers and/or storm drain, which will further convey the flows into the onsite retention/detention basins.

Seven (7) onsite basins (B1 through B7) are proposed of various sizes throughout the project site, which will all work together in interconnected fashion to store, attenuate, and convey storm water within the project site. These basins will feature outlet structures in the form of outlet pipes and/or weirs to convey storm water between the basins or to convey it off the project site to the north.

All basins shall be designed with storage volume and outlet structures to reduce the 50%, 10%, and 1% annual chance post-developed discharge to 90% of the overall onsite pre-developed discharge rates as well as provide first-flush runoff volume reduction per PCRFCD Design Standards for Stormwater Detention and Retention (DSSDR). Volumes for the first flush retention will be determined per Table 2.1 of the DSSDR; the required first-flush volume for the project will be provided/incorporated into proposed retention/detention basins B3, B4 and B7 (see Exhibit II-D.1)

Low Impact Development Practices will be furthered by: 1) setting the goal of limiting all retained depths to a maximum of 9-inches, and 2) employing standard water harvesting elements into common area landscaped areas through depressed planters (micro-basins).

Volumes for each of the retention/detention basins were preliminarily determined per Equation 3.8 of the DSSDR. The calculated first flush volume was also added to the Equation 3.8 volume to arrive at overall Retention/Detention volumes for each basin indicated below. Since most of these basins are proposed as interconnected, and will also feature the commingling of onsite and offsite storm water, the volumes required for individual basins becomes less meaningful as storm water passes through the various basins. A preliminary 2-dimensional HEC-RAS model was completed for this scenario to reasonably ensure that the basins are sized appropriately. Table 3, below, indicates the proposed basin volumes.

Table 3: Proposed Retention / Detention Basin Volume Results

Basin ID	Overall Ret/Det Volume (Cubic Feet)
B1	**7,650**
B2	**20,430**
B3	**16,220**
B4	**13,960**
B5	**18,280**
B6	**3,710**
B7	**25,090**

Street drainage and scuppers will be designed per the Pima County Subdivision and Development Street Standards to serve this project. Curbs will be provided on both sides of the roadway sections, therefore runoff from the 10-year storm event will be contained within the curbs of the street and runoff from the 100-year storm event will be contained within the street rights-of-way.

f. Cross Drainage Structures

Because it is not feasible to convey all the offsite storm water around the proposed development, the project site must accept and convey offsite storm flows arriving from the south in a reasonable manner. As such, several of the conveyance structures proposed on the project site, including basins and culverts between the basins, can be said to qualify as cross drainage structures. At a minimum, this includes Basins B1, B2, B3, and B5 as well as each set of pipes connecting them.

g. Floodplain Encroachment and Erosion Protection

Because there are no mapped floodplains on the site, there will be no floodplain encroachment. The sheet flow conveyance area that exists currently on the property will be replaced with conveyance through the basin network and through street flows. As for erosion protection, the appropriate protection measures will be included with the project design, and will consist of riprap aprons at scupper and culvert outlets, and possibly toedown adjacent lots bordering the proposed conveyance channels.

h. Storm Drains

The onsite storm water is will be conveyed in the proposed onsite streets, through proposed scuppers, and routed through the proposed detention/ retention basin system. Storm drains are intended to be avoided as a means of conveying storm water within this project site. However, the use of storm drains is a possibility if any of the streets are found to be insufficient for acceptable conveyance within the curb-to-curb roadway prisms. If storm drains should become necessary, the requisite hydraulic grade line analysis and inlet calculations will be performed.

Street drainage and scuppers will be designed per the Pima County Subdivision and Development Street Standards to serve this project. Curbs will be provided on both sides of the roadway sections such that storm water will be contained within the curbs during the 10% event, and within the right-of-way during the 1% event.

i. Easements Conflicting with Drainage Design

There are no existing easements within the project site that would present a conflict with the drainage design. Proposed drainage features for this project will be privately owned and maintained, therefore no drainage easements are anticipated.

j. Streets, Lots, and Building Pads

Please see Exhibit II-D.1 for conceptual post-development hydrology. The streets, lots, and building pads shown thereon will be accounted for in the determination of the post-development hydrology. For supplemental information, also see Appendix "E" for conceptual grading detail.

2. Preliminary Integrated Water Management Plan

The rezoning property is served by Tucson Water, which has a 100-year assured potable and renewable water supply. A will-serve letter from Tucson Water is provided below in Exhibit II-D.2. The project's required Table "A", representing the developer's commitment to implement sufficient water conservation standards, will be provided at the time of future subdivision platting.

3. Post-Development On-Site Hydrology

a. Response to Constraints and Opportunities

The proposed subdivision is laid out in a configuration that reflects the property's rectangular shape, while also providing the opportunity for integrated open spaces. These open spaces will be used mostly as basins to store, attenuate, and convey the offsite and onsite storm water to the designated outfall locations. First-flush retention areas will be included within several of the seven (7) proposed basin areas.

b. Encroachment into Flood Control Resource Areas

There will be no encroachment into Flood Control Resource Areas as a result of this project. The only resource anywhere near the project vicinity is the aforementioned Oak Tree Channel, which is located offsite to the east.

c. Discharges Leaving the Site

The design drainage solution intercepts offsite storm water and distributes it through the system of proposed basins, while also commingling it with onsite storm water flows. This commingled storm water will be returned to its existing sheet flow conveyance downstream (across our north boundary), with no adverse impact to flow depths or velocities. The discharge leaving the site is intended to do so primarily from Basin B5, which is illustrated on Exhibit II-D.1, and will feature a long weir section in order to mimic the existing condition of overland storm water sheet flow at this location.

d. Mitigation of Drainage and Erosion Problems

As discussed above, there are no erosion hazards impacting this site. The project's final drainage design will include elements to mitigate minor erosion issues through its system of onsite detention/retention basins for peak flow attenuation and first-flush retention. Also included will be riprap splash pad and slope protection where necessary, as well as toedown alongside lots where storm water conveyance is proposed.

e. Overall Effect on the Drainage Pattern of the Site

The proposed development will not fundamentally change any drainage patterns in the area. This includes both their magnitudes and the locations of current discharges. Although there will be some changes interior to the project site, the general drainage scheme already existing at the property, and outside of its boundaries, will be maintained. The site will be designed to conform to all applicable PCRFCD and ADEQ policies and criteria. Improvements to the project will be implemented with an intent to minimize impacts to upstream and downstream lands. Stormwater pollution prevention will be implemented at the time of the project construction to minimize impacts to adjacent lands during construction.

Exhibits to Follow

DEVELOPED CONDITIONS TABLE		
CONCENTRATION POINT	AREA (acres)	Q100
1	1.09	8.8
2	1.38	11
3	1.34	11
4	0.62	5.1
5	0.66	4.3

DEVELOPED CONDITIONS TABLE		
CONCENTRATION POINT	AREA (acres)	Q100
6	0.90	5.8
7	1.99	17
8	0.56	4.9
9	1.27	11
10	2.27	20

DEVELOPED CONDITIONS TABLE		
CONCENTRATION POINT	AREA (acres)	Q100
11	0.80	5.0
12	0.70	4.4
13	1.33	8.4

AVAILABLE BASIN STORAGE VOLUMES	
BASIN B1	7,650 CF
BASIN B2	20,430 CF
BASIN B3	16,220 CF
BASIN B4	13,960 CF
BASIN B5	18,284 CF
BASIN B6	3,711 CF
BASIN B7	25,086 CF

LEGEND

SITE — **Rezoning Site**

Existing Condition Topographic Contour (2' Interval)

Post-Development Watershed Boundary

Drainage Area and Concentration Point

Scupper Location

Direction of Surface Flow

Storm Drain

Open Space, Landscape and Storm Water Retention/Detention Area

16' Emergency Access Only with Stabilized Drivable Surface (Cable or Gate Barrier)

NOTE:

Basin Nos. 3, 4, & 7 will be used to satisfy the Project's required First-Flush Retention Volume.

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LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-D.1
PROPOSED HYDROLOGY

November 28, 2022

CBRE
7320 N San Blas Dr
Tucson, AZ 85704
Attn: Benjamin Becker

SUBJECT: **Water Availability for Project: Stinson Property, APN: 138240310; 138240320, Case#: TW-WAV-1122-00013, 15S13E15, Location Code: UNINCORPORATED PIMA COUNTY, Total Area: 13.87ac**

Water Supply

Tucson Water will provide water service to this project based on the subject zoning of the above parcel. Tucson Water has an assured water supply (AWS) designated from the State of Arizona Department of Water Resources (ADWR). An AWS designation means Tucson water has met the criteria established by ADWR for demonstration of a 100-year water supply - it does not mean that water service is currently available to the subject project.

Water Service

The approval of water meter applications is subject to the current availability of water service at the time an application is received. The developer shall be required to submit a water master plan identifying, but not limited to: 1) Water Use; 2) Fire Flow Requirements; 3) Offsite/Onsite Water Facilities; 4) Loops and Proposed Connection Points to Existing Water System; and 5) Easement/Common Areas.

Any specific area plan fees, protected main/facility fees and/or other needed facilities' cost, are to be paid by the developer. *If the existing water system is not capable of meeting the requirements of the proposed development, the developer shall be financially responsible for modifying or enhancing the existing water system to meet those needs.* ***This letter shall be null and void two years from the date of issuance.***

Issuance of this letter is not to be construed as agency approval of a water plan or as containing construction review comments relative to conflicts with existing water lines and the proposed development.

If you have any questions, please call New Development at (520) 791-4718.

Sincerely,

Michael Mourreale

Michael Mourreale, P.E.
Engineering Manager
Tucson Water Department

P.O.BOX 27210 ● TUCSON, AZ 85726-7210
(520) 791-4718 ● www.tucsonaz.gov/water

Exhibit II-D.2
Tucson Water Will-Serve Letter

E. BIOLOGICAL RESOURCES

This site contains no biological resources of any note. The entire property was cleared and graded by past agricultural uses and the current manufactured home residences. Only a few trees exist here and there, so there is limited potential for the salvaging of any native specimens. These few remaining trees will be assessed for salvage and transplantation on the future Native Plant Preservation Plan (NPPP) provided at the time of future site development and permitting. Salvaged specimens, if any, will be used in perimeter project buffers adjoining neighboring residential properties so as to assist in creating a mature aesthetic as rapidly as possible.

1. Expected Impacts

a. Conservation Lands System (CLS) Compliance

This project falls wholly outside of the Maeveen Marie Behan Conservation Lands System.

b. Saguaros

The site has been inventoried and found to contain no (0) saguaros.

c. Ironwood Trees

The site has been inventoried and found to contain no (0) ironwood trees.

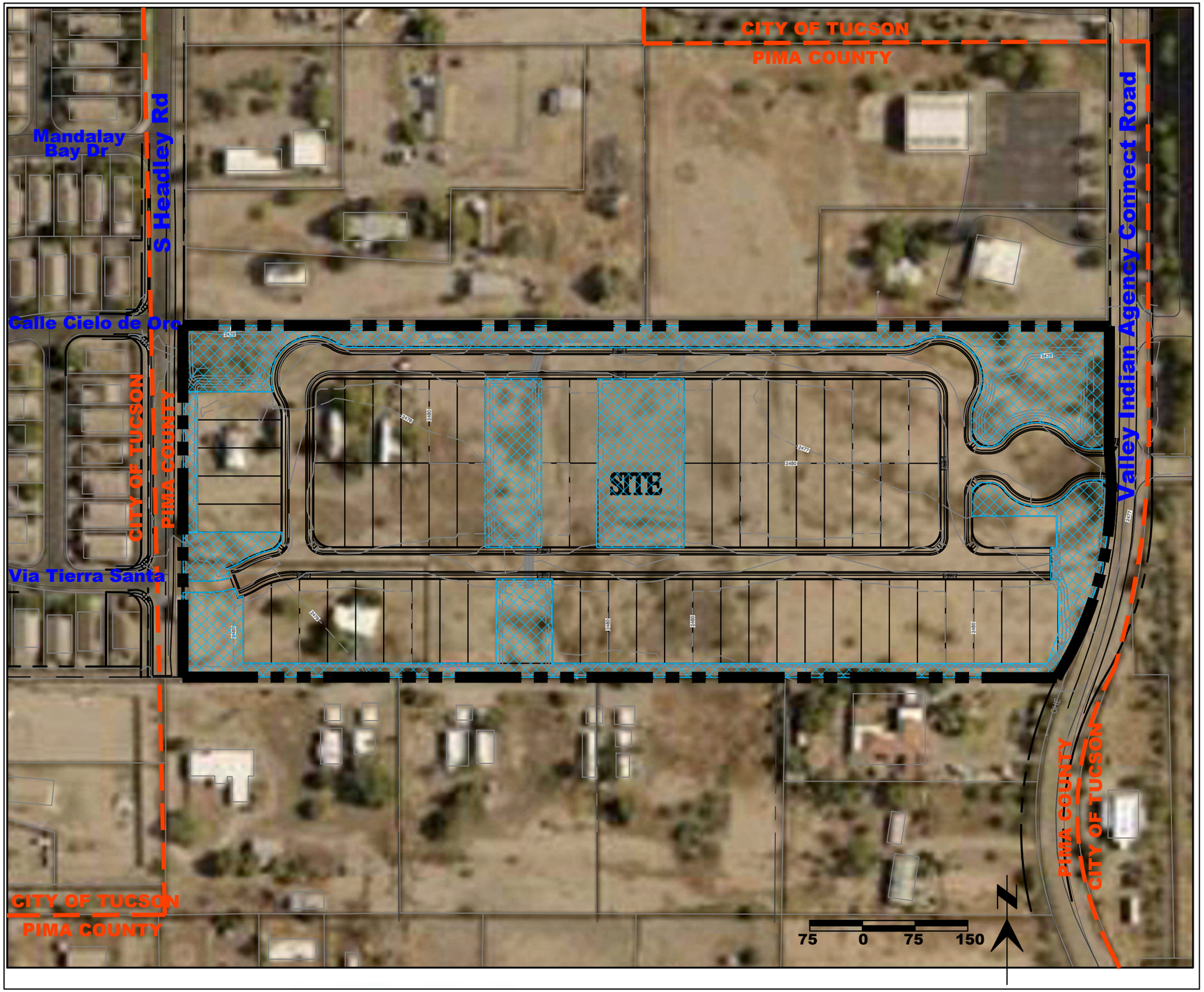
d. Pima Pineapple Cactus

The site is not located within the Priority Conservation Area (PCA) for the Pima Pineapple Cactus. While it was not formally surveyed for same during our inventory of saguaros and ironwood trees, none (0) were seen on the site during said inventory.

e. Needle-Spined Pineapple Cactus

The site is not located within the Priority Conservation Area (PCA) for the Needle-Spined Pineapple Cactus. While it was not formally surveyed for same during our inventory of saguaros and ironwood trees, none (0) were seen on the site during said inventory.

Exhibit to Follow



LEGEND

SITE — Rezoning Site

Proposed Open Space Areas (Landscape Buffers, Active/Passive Recreation & Storm Water Detention/Conveyance)

NOTE:
This Property contains no (0) Ironwood Trees and no (0) Saguaros. This entire site has been cleared by past agricultural and residential activity.

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Bowman

Headley Road Rezoning
6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-E
BIOLOGICAL RESOURCES

F. LANDSCAPE, BUFFERYARDS & VISUAL MITIGATION

1. Bufferyards in Accordance with Chapter 18.73

Exhibit II-F.1 provides a schematic of the project's required landscape bufferyards in compliance with Chapter 18.73 (Landscape and Screening) of the Pima County Zoning Code. The final determination of each particular bufferyard option (i.e. with its attendant width, plant-density requirements, etc.) will be determined at the time of future site development engineering and permitting.

This project will give special attention to the lower-density residential properties adjoining the site to the north and south; both of these boundaries mandate a Bufferyard "C". Exhibit II-F.2 has been included to illustrate a conceptual elevation for this perimeter condition, as well as one for the street landscape buffer required along Valley Indian Agency Connect Road (the project's designated front yard).

2. Conflicts with Bufferyards Due to Easements, Rights-of-Way, etc.

There are no potential conflicts with required bufferyards due to easements or rights-of-way.

3. Impacts of Transplanted/Salvaged Vegetation in Bufferyard Areas

Any viable desert trees (no saguaros or ironwoods exist on the site) will be assessed for salvage and transplantation into perimeter bufferyards, basin areas, and other open spaces within the property. See Section II-F.1 immediately above; the potential for salvage is rather limited on this particular site.

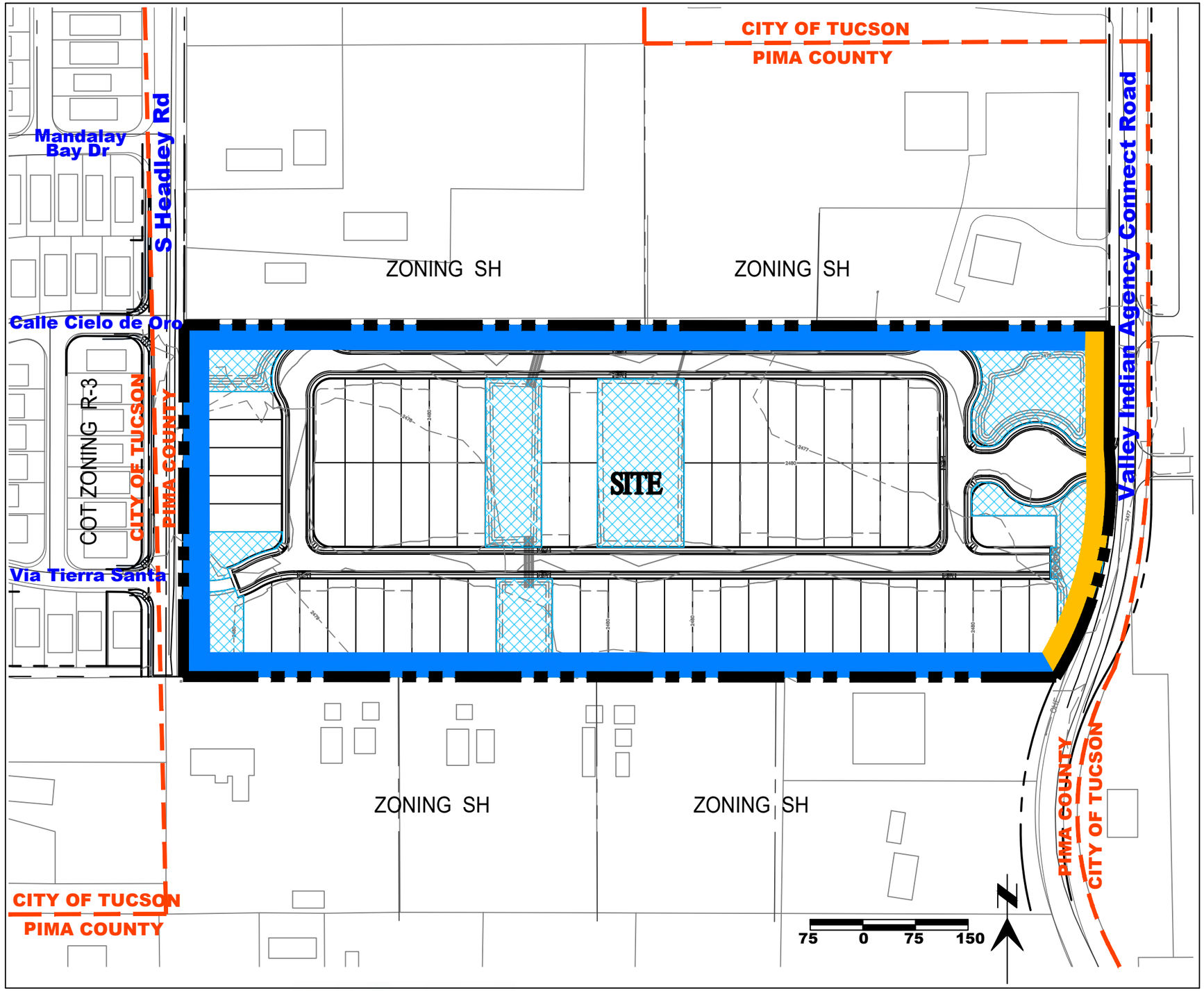
4. Mitigation of Visual Impacts

The visual impacts from this project can be considered routine. Residential neighborhoods of similar density already exist to the immediate west. The lower-density residences to the north & south will be buffered per Section II-F.1 above and Exhibit II-F.2 so as to provide reasonable mitigation of visual impacts.

5. Significant Vegetation

As mentioned previously, only a small number of desert trees remain on the site due to its past/historical grading and clearing. These will be assessed for salvage and transplantation on the future Native Plant Preservation Plan (NPPP) provided at the time of development plan/plat filing. Also see Section II.F.1 above.

Exhibit to Follow



LEGEND

SITE — Rezoning Site

Bufferyard 'A' Required

Bufferyard 'C' Required

Proposed Open Space Areas (Landscape Buffers, Active/Passive Recreation & Storm Water Detention/Conveyance)

NOTE:
Final Bufferyard options for width, plant densities, etc. to be determined at time of final Landscape Plan during subdivision platting. See Exhibit II-F.2 for landscape buffer concepts.

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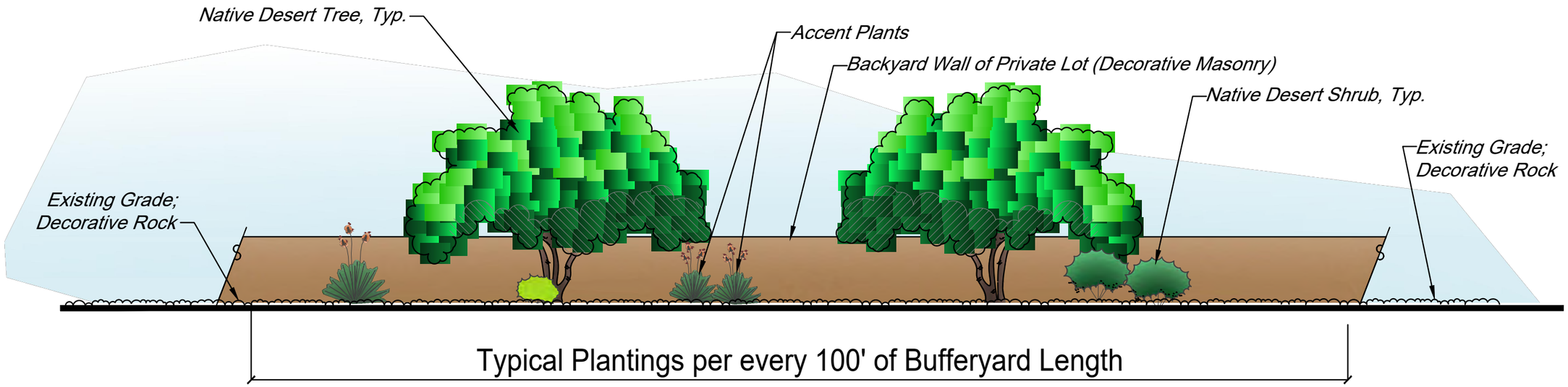
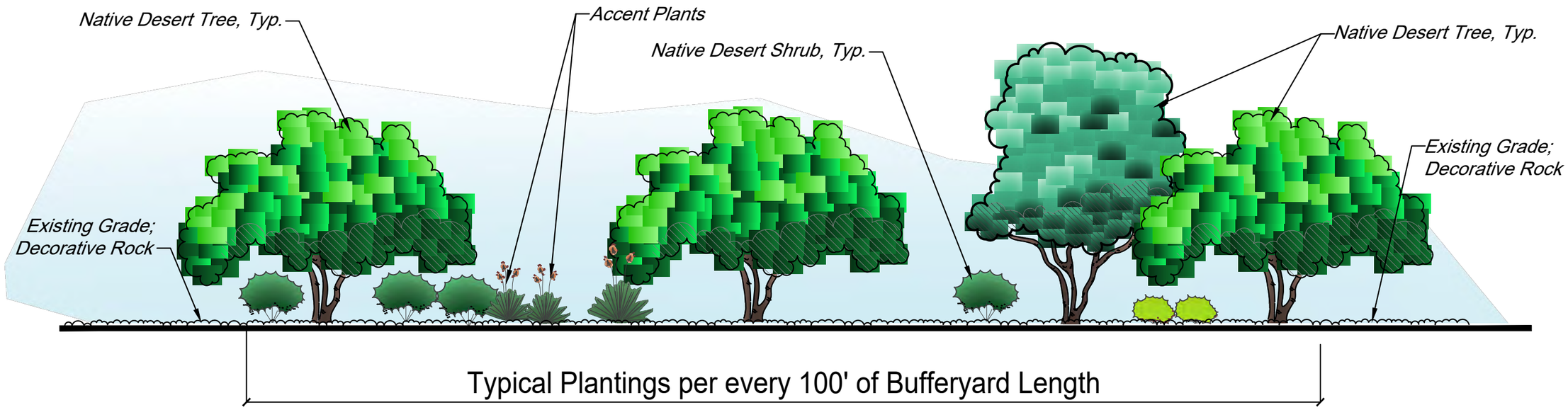
EXHIBIT II-F.1
LANDSCAPE & BUFFERYARD PLAN
PAGE 47



ELEVATION A - Typical Bufferyard "C" along North and South Property Boundaries, and Headley Road
NTS



ELEVATION B - Typical Bufferyard "A" along Valley Indian Agency Connect Road
NTS

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
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EXHIBIT II-F.2
PERIMETER BUFFERYARD ELEVATIONS

G. TRANSPORTATION

1. Configuration of Proposed Ingress/Egress

The site's primary access occurs off of Valley Indian Agency Connect Road and is aligned with the private driveway immediately across the street. This main entry will be gated, with a turn-around cul-de-sac incorporated into its design in accordance with Section 4.10 of the *Subdivision & Development Street Standards.* The preliminary TIS in Appendix "C" includes a queuing analysis; the needed queuing distance of three (3) cars from the keypad location can be accommodated within the onsite turnaround cul-de-sac provided; no right-turn lane into the project on Valley Indian Agency Road is warranted.

A second access point will be provided on Headley Road, but it shall be only for access by emergency-service vehicles (police, fire, EMS,etc.). This emergency access drive will be sixteen feet (16') wide and will have a durable/stabilized driving surface, as well as a gate, cable, or some form of barricade that is jointly acceptable to emergency service providers and to Pima County DOT. The final details of this feature will be determined at the time of future subdivision platting.

2. Distances to Adjacent Access Points

See Exhibit II-G, on which the project's proposed access points are depicted in context with the other private drives in the vicinity. Both of these access points align with existing driveways or public streets so as to eliminate any off-set issues.

3. Associated Off-Site Roadway Improvements and Completion Schedule

There are no off-site roadway improvements necessary or planned at this time.

4. Change in ADT and Level of Service (LOS) for Public Streets

Trip-generation calculations for this Site Analysis employ the following Institute of Transportation Engineers (ITE) trip-generation category:

- Single Family Detached Residence (Code 210); 9.43 vehicle trips per day

If the above figure is applied to the proposed 69-lot residential subdivision, it yields a total trip generation of six hundred fifty-one (651) trips. The preliminary Traffic Impact Study (TIS) within Appendix "C", however, applies the fitted curve equation to the project, resulting in a more accurate total trip generation of seven hundred seventeen (717) trips.

5. Conformance with Pima County Concurrency Requirements

Per the traffic-volume and capacity data provided in Section I-E of this Site Analysis, together with the detailed TIS findings provided in Appendix "C", Valley Indian Agency Connect Road, as well as its intersection with Valencia Road, can readily absorb the additional amount of traffic generated by the proposed project.

6. Proposed Bicycle & Pedestrian Pathways

There are no existing bicycle lanes or striped multi-use lanes on either Valley Indian Agency Connect Road or Headley Road.

7. On-Site Street System

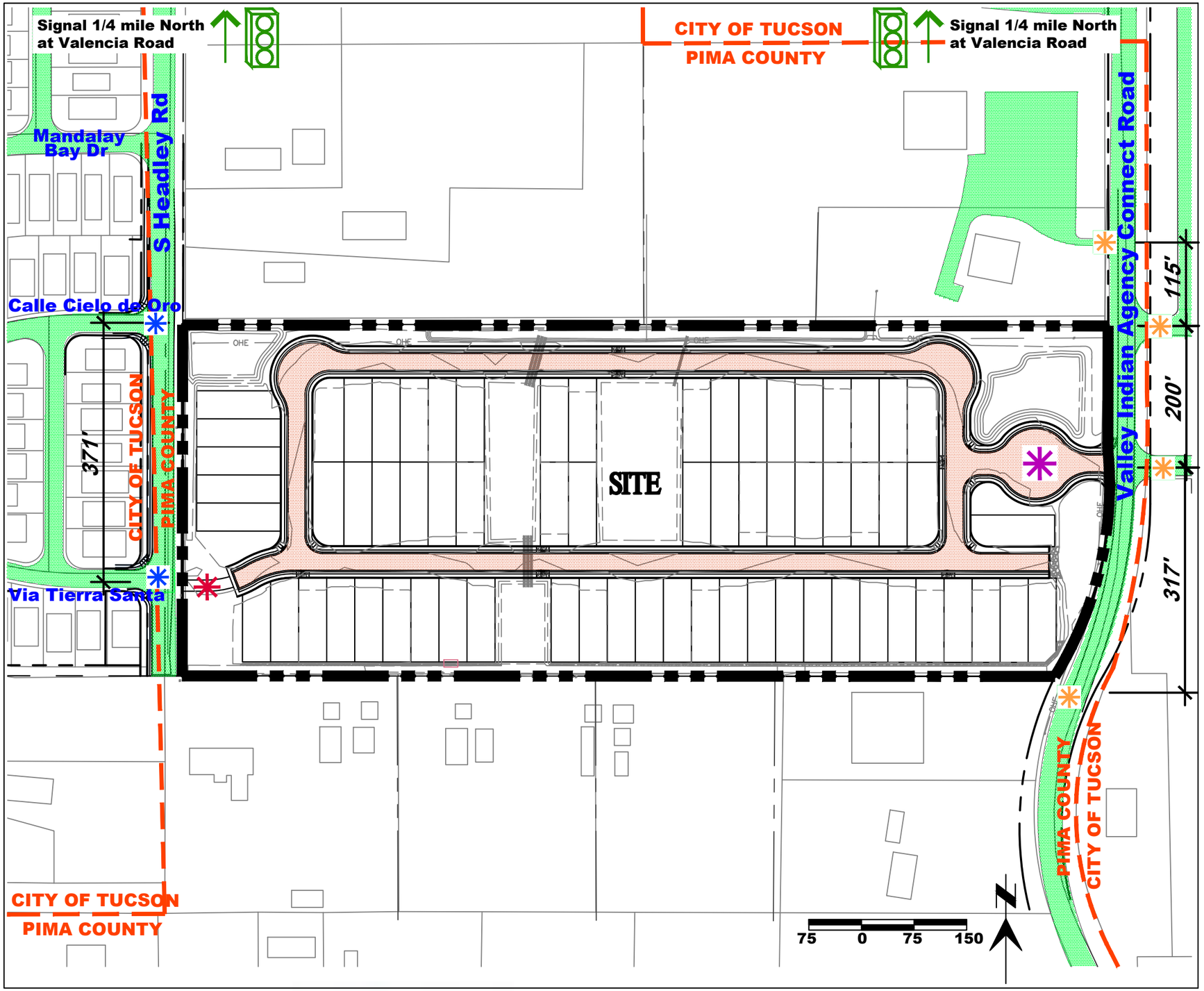
The project will be served by private streets with a forty-five foot (45') right-of-way, 24' travel lanes, wedge curbs, and 5' wide concrete sidewalks, all in accordance with the adopted 2016 *Subdivision and Development Street Standards (SDSS).*

The emergency access drive onto Headley Road will be sixteen wide (16'), with a stabilized/durable driving surface that is acceptable to emergency-service providers and to Pima County DOT. Its final details will be determined at the time of future subdivision platting.

8. Applicability & Timing of Traffic Impact Study (TIS)

A preliminary Traffic Impact Study (TIS) is provided in Appendix "C".

Exhibit to Follow



LEGEND

SITE — Rezoning Site

Public Street R.O.W. Line

Existing Offsite Pavement
(Streets or Private Improvements)

Existing Structures (Manufactured Homes); to be removed

Existing Private Driveway Location

Existing Public Street Intersection

New Gated Entry Point for Proposed Residential Subdivision
(Project Main Entrance with Turnaround Area)

16' Emergency Access Only with Stabilized Drivable Surface (Cable or Gate Barrier)

10' — Approximate Distances between Intersections / Driveways

Signalized Intersection

Proposed On-Site Residential Streets:
New 24' Wide Pavement with Wedge Curbs and Sidewalks (45' R.O.W.)

Jim Portner, Agent for Owner
PROJECTS INTERNATIONAL, INC.
10836 E. ARMADA LANE
TUCSON, ARIZONA 85749
520 850-0917

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-G
TRANSPORTATION

H. ON-SITE WASTEWATER TREATMENT & DISPOSAL

1. Rationale for Non-Connection to Public System

Not applicable; no on-site wastewater treatment is proposed with this project. The project will connect to the public sewer system.

2. Soil Evaluations

Not applicable; no on-site wastewater treatment is proposed with this project.

3. Reserve Disposal Areas

Not applicable; no on-site wastewater treatment is proposed with this project.

I. SEWERS

1. Capacity Response Letter

Capacity Response Letter No. P23WC00117, from the Pima County Regional Wastewater Reclamation Department (PCRWRD) is attached as Exhibit II-I.1.

2. Method of Sewer Service and Point of Connection to Public System

The proposed sewer system for the project will connect to the existing 8" public sewer G-2000-046, at Manhole No. 4393-09 (see Exhibit II-I.2 for a conceptual layout of the proposed on-site sewer design). The proposed connection point is different than that referenced in our Type I Capacity Letter (MH #4393-17), but is downstream of that point where capacity is indicated as available. This alternative manhole connection is necessary due to the prevailing fall of the site from south to north, together with the extreme flatness of the land. All future RWRD capacity allocation requests and letters will reference MH #4393-09.

Conceptually, the westernmost portion of the project will drain via gravity to the north. The remaining portion of the site will drain to the east/northeast to a private lift station located in the northeast corner of the site. This collected flow will be pumped westward in a pressure main to the gravity portion of the system, and then subsequently conveyed into the existing 8" public line (G-2000-046) on the west side of S. Headley Road.

This entire proposed sewer collection and conveyance system, including its final gravity segment that connects to MH #4393-09, will be private and shall be based on Pima County Engineering Design Standards 2022, Engineering Standards Manual, Bulletin 11 (ADEQ) guidelines and the Arizona Administrative Code Chapter 18, or as applicable at the time of final design.

3. Sewers Easements

Any required easements shall be provided at the time of subdivision platting.

4. Mitigation of Any Constraints to Gravity Service

The sewer design described in Section II-I.2 above addresses the constraints to gravity service stemming from the property's exceedingly flat topography.

Exhibits to Follow

JACKSON JENKINS
DIRECTOR

PIMA COUNTY
WASTEWATER RECLAMATION
201 NORTH STONE AVENUE
TUCSON, ARIZONA 85701-1207

PH: (520) 724-6500
FAX: (520) 724-9635

April 17, 2023

Natalee Wareham
Bowman
3275 W. Ina Road, Suite 220
Tucson, AZ 85741

Sewerage Capacity Investigation No. P23WC00117 Type I

RE: **Headley Valencia, Parcels 138240310, 138240320**
Estimated Flow 16,200 gpd (ADWF)

Greetings:

The above referenced project is tributary to the Agua Nueva Water Reclamation Facility via the Southwest Interceptor.

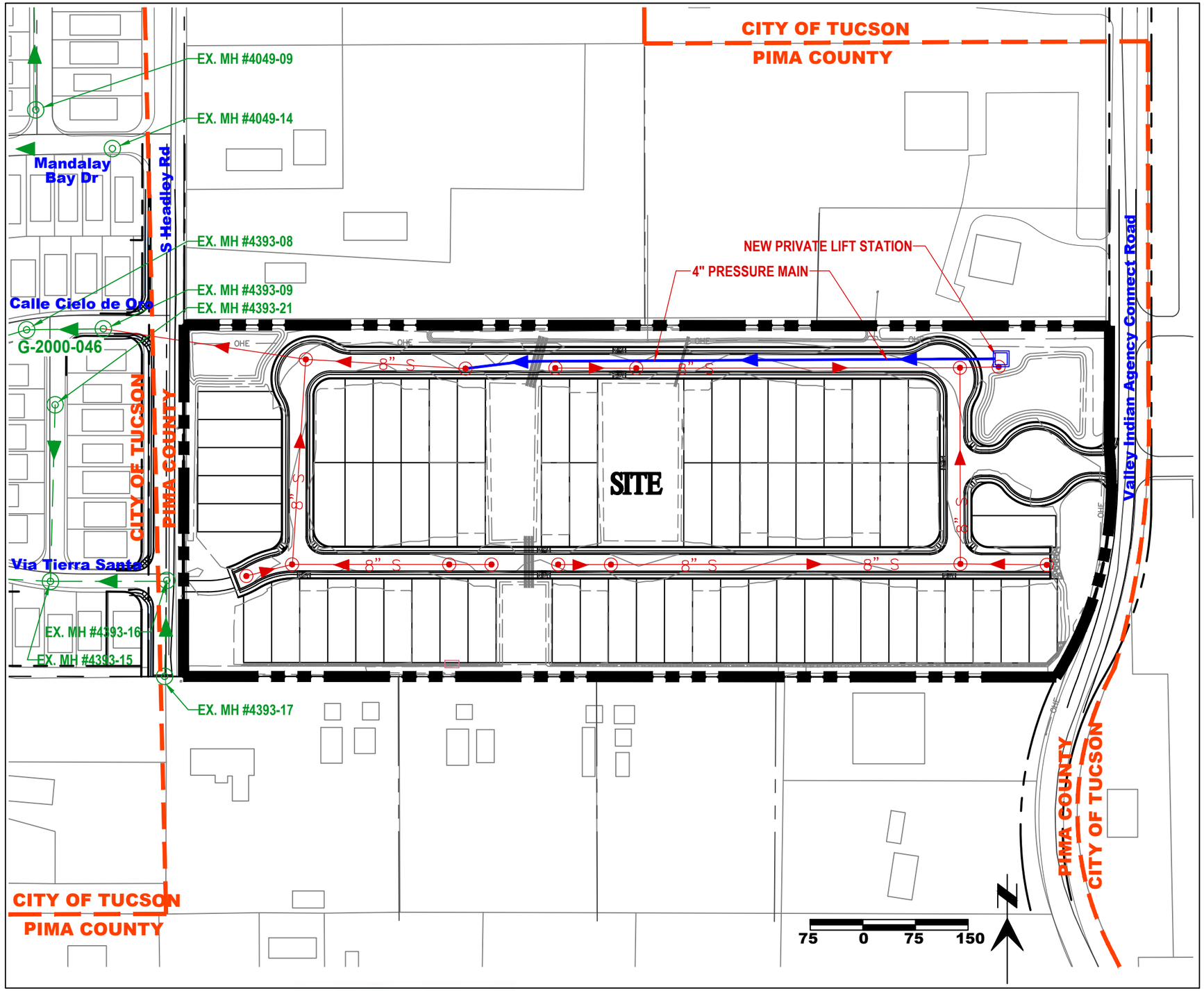
Capacity is currently available for a project this size in the public sewer G-2000-046, downstream from manhole 4393-17.

This letter is not a reservation or commitment of treatment or conveyance capacity for this project. It is not an approval of point and method of connection. It is an analysis of the system as of this date. Allocation of capacity is made by the Type III Capacity Response.

If further information is needed, please feel free to contact us at (520) 724-6488.

Reviewed by: Mirela Hromatka, Planner Sr.

Exhibit II-I.1
RWRD Capacity Response Letter



LEGEND

- Rezoning Site
- Existing Public Sewer and Flow Direction
- G-2000-046 — Sanitary Sewer Pipe Identification
- EX. MH #4049-14 — Sanitary Sewer Manhole Identification Number
- 8" S — New Private 8" Gravity Sewer & Manhole
- New Private Lift Station
- 4" Pressure Main from Lift Station (Private)

NOTE:

The entire sewer collection and conveyance system for this project is private, including the final gravity segment that drains into Public Manhole No. 4393-09.

Jim Portner, Agent for Owner
PROJECTS INTERNATIONAL, INC.
10836 E. ARMADA LANE
TUCSON, ARIZONA 85749
520 850-0917

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-I.2
PROPOSED SEWER CONCEPT
PAGE 55

J. WATER

REFER TO PRIOR SECTION II.D.2 OF THIS SITE ANALYSIS.

K. SCHOOLS

1. Access to Internal or Abutting Schools.

The site is within the Tucson Unified School District No. 1. No schools immediately abut the rezoning site or exist within one (1) mile of it. Exhibit II-K.1 illustrates the private schools that exist within the one-mile radius.

2. Capacity Analysis by TUSD.

A school impact/capacity analysis is provided by Tucson Unified School District No. 1 (TUSD) in Exhibit II-K.2. The analysis concludes that capacity exists to absorb the new students generated by the project.

3. Communication with TUSD Regarding Mitigation of Impacts.

The District has advised us of its voluntary roof-top contribution program for new residential developments and provided us with a copy of its standard agreement form. It is the developer's intent to participate in the program.

L. RECREATION & TRAILS

1. On-Site Recreation Elements

Exhibit II-L provides the schematic of the project's active and passive recreation areas. These improvements include a traditional developed recreation area, an active physical fitness area, a contemplative garden area, and a dog park. Final design and calculation of these improvements will be provided on formal Recreation Area Plans (RAP's) provided at the time of future subdivision platting, together with the final determination of in-lieu fees, if any, associated therewith. The goal of this project is to satisfy all required recreation on-site, with no in-lieu fees necessary. Amenities provided will focus on community-fostering improvements that enhance the neighborhood's social fabric.

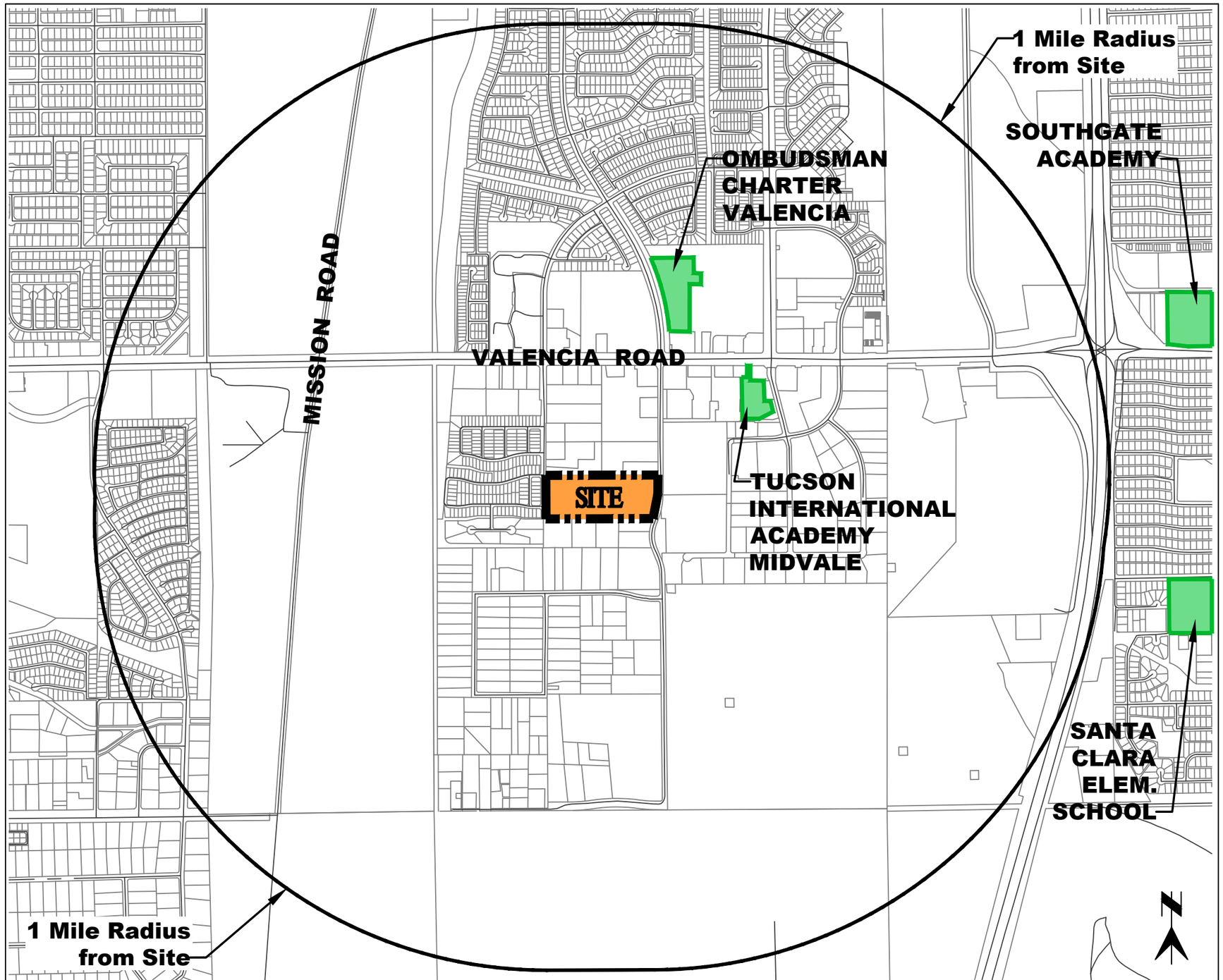
2. Ownership & Maintenance of Recreation Elements & Natural Areas

All new recreation improvements on-site will be for the private use of its residents and will be wholly maintained by the subdivision's homeowners association (HOA).

3. Proposed Public Trails In or Adjacent to the Development

As shown on Exhibit I-G, no dedicated or planned public trails exist within or adjacent to the proposed development.

School and Recreation Exhibits to Follow



LEGEND

SITE — Rezoning Site

Existing Private Schools

No Public Schools exist within one (1) mile.

NOTE

This Rezoning Site is served by the Tucson Unified School District No. 1 (TUSD). It is served by the following schools, all of which are more than two (2) miles from the Site:

- Maldonado Elementary School
- Pistor Middle School
- Pueblo High School

Jim Portner, Agent for Owner
PROJECTS INTERNATIONAL, INC.
10836 E. ARMADA LANE
TUCSON, ARIZONA 85749
520 850-0917

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-K.1
PUBLIC SCHOOLS

TUCSON UNIFIED
SCHOOL DISTRICT

Department of Operations
530 S Norris Av, Tucson, Arizona 85719
(520) 225-4948

To: **Jim Portner, Principal Projects International Inc.**

From: **Bryant Nodine, TUSD Operations Program Manager**

Date: **April 13, 2023**

Re: **Case/Project #:** **unknown**
Project Name: **Headley South of Valencia**
New Units: **67 SFD**

Impacted Schools	Capacity	Current Enrollment	Additional Students from Project	Projected Enroll w/Project
Maldonado Elementary	570	260	17	277
Pistor Middle	850	731	9	740
Pueblo High	1900	1851	12	1863

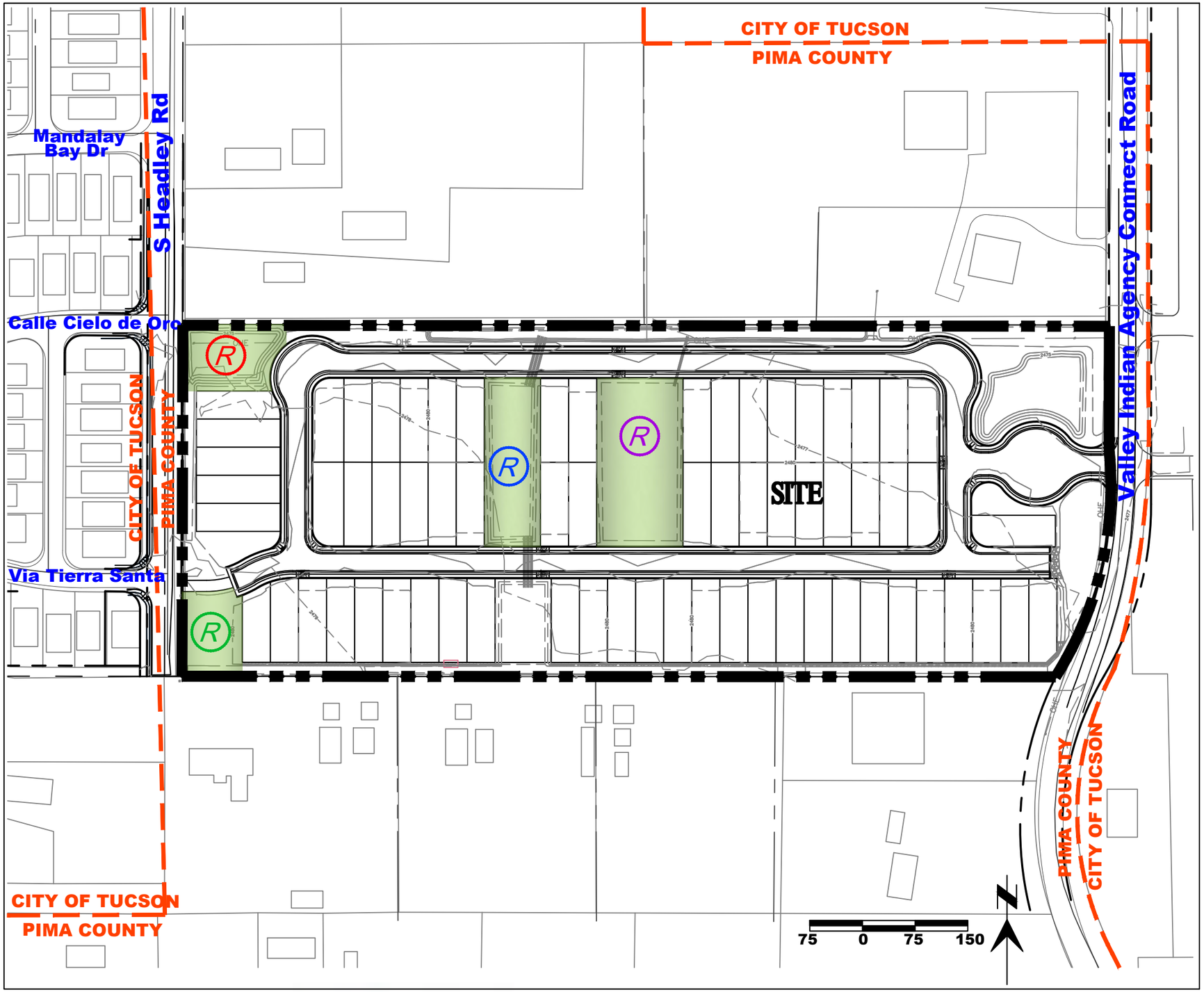
Response:

Based on the current enrollment at TUSD, there is adequate capacity to absorb the impact of the proposed development. However, considering an ideal utilization rate of 85% to 90% and with other projected developments, notably at Cardinal-Valencia and Cardinal-Bilby, Pueblo High School is expected to be over capacity.

To help alleviate the projected overcrowding, we encourage voluntary monetary contributions, which will be used for capital improvements.

P:\Projects\Development Review\2023\Headley S of Valencia 13Apr23.docx

Exhibit II-K.2
TUSD Capacity Analysis Letter



LEGEND

SITE — Rezoning Site

R — Traditional Developed Recreation Area

R — Active Fitness Recreation Area

R — Passive Contemplative Garden Recreation Area

R — Dog Park Recreation Area

NOTE:
Formal Recreation Area Plans (RAP's) to be provided at time of future subdivision platting. All recreation improvements will be privately constructed and maintained.

Jim Portner, Agent for Owner
PROJECTS INTERNATIONAL, INC.
10836 E. ARMADA LANE
TUCSON, ARIZONA 85749
520 850-0917

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
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Bowman

Headley Road Rezoning

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REZONING: SH to CR-5

EXHIBIT II-L
ON-SITE RECREATION & TRAILS
PAGE 59

M. CULTURAL RESOURCES: ARCHAEOLOGICAL/HISTORIC SITES

1. Mitigation Measures for Already Identified/Known Resources

As indicated in Section I-H of this Site Analysis, a *Class III Cultural Resources Survey* was completed for subject property by Tierra Right-of-Way Land Services Company in July, 2022; see Appendix "D" of this Site Analysis.

2. Measures Employed if Archaeological Survey is Recommended

See Appendix "D" for detailed findings. In short, no sites or historic buildings were observed on the property and no further survey work is recommended.

3. Submittal Timing, etc. of Mitigation Plan

No resources were identified on the site.

a. Outline of Resource Assessment Program

See the *Class III Sur*vey provided in Appendix "D".

b. Effective Preservation Plan or Data Recovery

Not applicable; no sites or resources were identified.

c. Schedule of Mitigation Plan Implementation

Not applicable; see immediately above.

N. ENVIRONMENTAL QUALITY

1. Dust Control During Construction

During construction, a Stormwater Pollution Prevention Plan (SWPPP), along with a Notice of Intent (NOI), will be prepared in accordance with Arizona Department of Environmental Quality (ADEQ) regulatory permit requirements. The SWPPP and NOI will discuss, among other items, the proposed dust-control and erosion-control measures that must be undertaken and suitably performed by the project's contractor as stipulations of the grading permit.

O. AGREEMENTS

1. Specific Agreements with Neighboring Property Owners

No specific or formal agreements are in place with any neighboring property owner(s) and none are necessary.

No registered neighborhood associations exist within the surrounding area. Existing homeowners associations (HOA's) for the established subdivisions to the west (within the City of Tucson) were notified in 2022 as part of the approved comprehensive plan amendment for this property, as well as for the formal neighborhood meeting associated with this rezoning. No issues were raised by these HOA's.

Our publicly noticed neighborhood meeting took place on July 10, 2023, well in advance of the public hearing before the Planning & Zoning Commission. The meeting venue was the Midvale Christian Center, adjacent to the rezoning site. Nine (9) individuals attended, seven (7) of whom were parish members of the Christian Center, and two (2) of which were from the Paraiso residential subdivision west of Headley Road within the City of Tucson.

All property owners within the statutory notice area were invited to the meeting via US Mail, totaling fifty-two (52) property owners. The invitation packets were put in the mail on June 23, 2023 (more than two weeks prior to the meeting) and were comprised of an explanatory cover letter/invitation, a Fact Sheet, and a color copy of our *Preliminary Development Plan (PDP).*

A copy of all meeting invitation materials and sign-in sheets, together with a written meeting summary, was furnished to Pima County staff after the meeting; these materials have been included in the staff report packet to the Commission.

Bibliography

Pima County Department of Transportation, Traffic Engineering Division website for current traffic counts; http://dot.pima.gov/trafeng/trafcnt/adt.htm.

Pima County Department of Transportation, *2016 Subdivision and Development Street Standards (SDSS).*

Pima County Major Streets & Scenic Routes Plan. *Pima County Ordinance No. 1995-42, as amended. Case No. Co14-79.* Web address: http://gis.pima.gov/maps/majscenic/mssr.pdf

Institute of Transportation Engineers (ITE). 2008. *Trip Generation, 8th Edition: An ITE Informational Report.*

The Smart Growth Network website, *Smart Growth Principles*, http://www.smargrowth.org/engine/index.php/principles

Florida Department of Transportation (FDOT), 2013. *Quality/Level of Service (QLOS) Handbook*

APPENDICES

Appendix A

Pima County Board of Supervisors Resolution No. 2022-71

Pertaining To

Amending the Comprehensive Plan Land Use Map

Adopted November 15, 2022

GABRIELLA CÁZARES-KELLY, RECORDER
Recorded By: MAM2
DEPUTY RECORDER
5037

P0230
PIMA CO CLERK OF THE BOARD
PICKUP

SEQUENCE: 20223210092
NO. PAGES: 3
11/17/2022
9:52:11

RESOLUTION 2022- 71

A RESOLUTION OF THE BOARD OF SUPERVISORS OF PIMA COUNTY, ARIZONA; RELATING TO PLANNING; AMENDING THE PIMA COUNTY COMPREHENSIVE PLAN LAND USE MAP, IN CASE P22CA00001 STINSON FAMILY TRUST – S. HEADLEY ROAD PLAN AMENDMENT, FROM THE LOW INTENSITY URBAN 3.0 (LIU-3.0) TO THE MEDIUM LOW INTENSITY URBAN (MLIU) LAND USE DESIGANTION, FOR APPROXIMATELY 15.5 ACRES (PARCEL CODES 138-24-0310 AND 138-24-0320) LOCATED ON THE EAST SIDE OF S. HEADLEY ROAD, APPROXIMATELY 1,400 FEET SOUTH OF THE INTERSECTION OF W. VALENCIA ROAD AND S. HEADLEY ROAD, IN SECTION 15 OF TOWNSHIP 15 SOUTH, RANGE 13 EAST, IN THE SOUTHWEST PLANNING AREA.

IT IS RESOLVED BY THE BOARD OF SUPERVISORS OF PIMA COUNTY, ARIZONA AS FOLLOWS:

Section 1. The Pima County Comprehensive Plan Land Use Map, Southwest Planning Area, is hereby amended to change the planned land use intensity category from Low Intensity Urban 3.0 (LIU-3.0) to Medium Low Intensity Urban (MLIU) for approximately 15.5 acres, as referenced in P22CA00001 Stinson Family Trust – S. Headley Road Plan Amendment, located on the east side of S. Headley Road, approximately 1,400 feet south of the intersection of W. Valencia Road and S. Headley Road, in Section 15, Township 15 South, Range 13 East, as shown on the map attached to this Resolution as Exhibit A and incorporated by this reference.

Section 2. The various County officers and employees are authorized and directed to perform all acts necessary to give effect to this Resolution.

Section 3. This Resolution shall become effective on the date of adoption.

Passed and adopted, this 15th day of November, 2022.

Sharon Bronson NOV 15 2022
Chair, Pima County Board of Supervisors

ATTEST:

Clerk, Board of Supervisors

P22CA00001

3

APPROVED AS TO FORM:

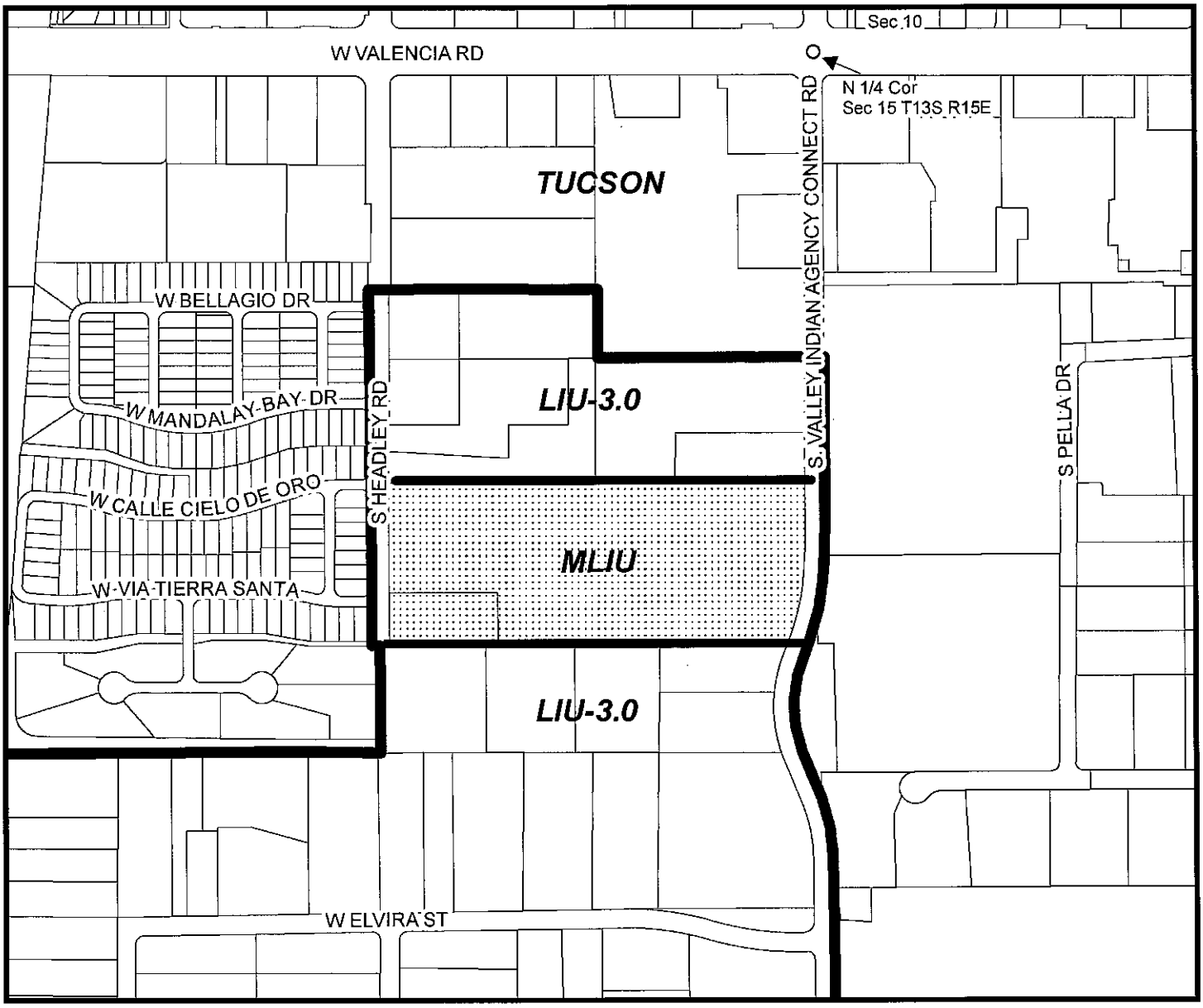
Deputy County Attorney
Krystal De La Ossa

APPROVED:

Executive Secretary
Planning and Zoning Commission

COMPREHENSIVE PLAN AMENDMENT

Planned Land Use



Taxcodes: 138-24-0310, 138-24-0320	**P22CA00001 STINSON FAMILY TRUST - S. HEADLEY ROAD PLAN AMENDMENT** Low Intensity Urban 3.0 (LIU-3.0) to Medium Low Intensity Urban (MLIU) 15.55 Acres +/-	District 5 Location: East side of S. Headley Road, Approx. 1,400 feet south of W. Valencia Road
	Southwest Planning Area under Pima Prospers Section 15, Township 15 South, Range 13 East	North
	Planning and Zoning Commission Hearing: June 29, 2022	Map Scale: 1:6,000
	Board of Supervisors Hearing: August 2, 2022	Map Date: October 3, 2022 / dms

Appendix B

Supplemental Hydrology Study & Off-Site Modeling

by

JE Fuller Hydrology & Geomorphology, Inc.
March, 2023

JE FULLER
define•communicate•solve

March 9, 2023

Ken Perry, Principal
Bowman Consulting Group, Ltd.
3275 West Ina Road, Suite 220
Tucson, AZ 85741

RE: Subdivision at Headley – Drainage Assistance

Ken,

This letter documents a rainfall runoff model prepared for the Subdivision at Headley project. Bowman Consulting (Bowman) is preparing design documents to convert this undeveloped land into a residential subdivision and has contracted with JE Fuller to provide this assessment of the surface flows entering and traversing through the project site. JE Fuller's role in this project includes the following tasks:

1. Existing conditions rainfall-runoff modeling with HEC-RAS 2D utilizing Pima County hydrology methods.
2. With-project modeling of the proposed site to determine how the proposed drainage infrastructure performs with conveying the offsite flows, and to provide a comparison of flows prior to development to those after development (encroachment analysis).

Existing Conditions Modeling per PC-HYDRO

Bowman originally modeled the offsite flows to this site using a PC-HYDRO approach. Their modeling included three sub-basins as shown in **Figure 1**. The offsite sub-basins began at Elvira Street and drained north. There was some question as to whether Elvira Street truly is the drainage divide, with this question being one of the reasons JE Fuller provided this assessment. (There were also questions about the use of simplified, lumped-parameter and 1D modeling in this distributary and flat drainage area.)

Bowman provided the PC-HYDRO calculation sheets to JE Fuller, and these were reviewed prior to this analysis. The resulting peak discharge values from the PC-HYDRO calculations are summarized in **Table 1**.

Table 1. PC-HYDRO Results per Bowman

Sub-basin	Area (acre)	Peak discharge (cfs)		
		2-year	10-year	100-year
O-1	4.03	3.7	9.7	21.1
O-2	5.72	4.0	10.7	24.7
O-3	7.99	5.8	15.5	35.4

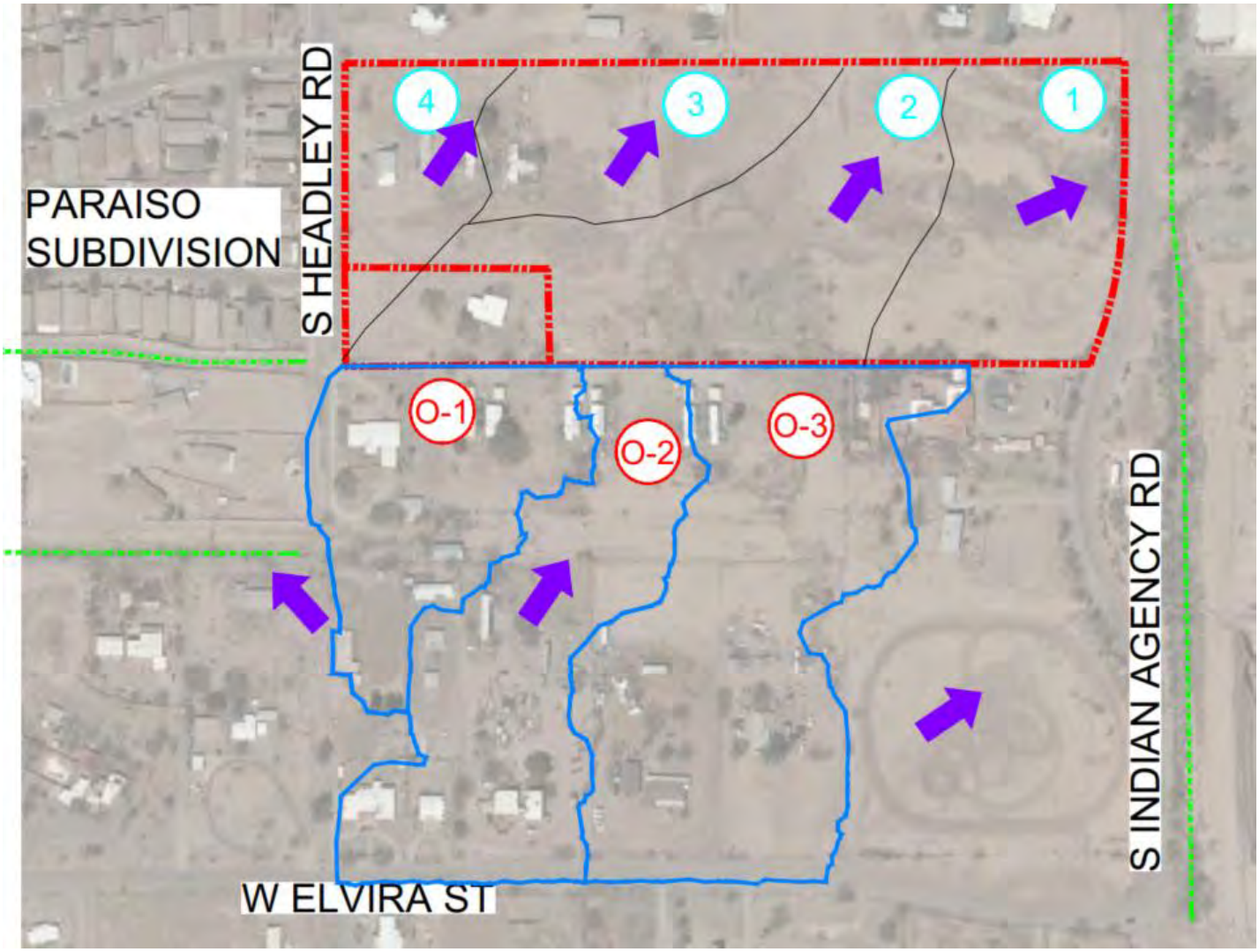


Figure 1. Original PC-HYDRO Sub-basins

Regional Drainage

Regional drainage surrounds this project with the Santa Cruz River being east of the site, the Santa Cruz River West Branch being south of the site, and USBR diversion channels being south of the site. Available FEMA flood hazard mapping suggests this regional flow does not impact the site for the 100-year flood. It is not known whether there is a risk of flow overtopping the USBR diversion channels south of this site. Analysis of regional flow entering this study area is beyond the scope of work for this project.

Existing Conditions HEC-RAS Rainfall Runoff Model

A HEC-RAS 2D model was prepared to compute rainfall runoff impacting the site. The model extends south to Los Reales Road, east to S. Valley Indian Agency Connect Road, west to the West Branch, and north to Bellagio Drive. The following points summarize the model parameters.

- A nominal 20-foot grid size was used with the cell size reduced to 10 feet within the project boundary.
- USGS one meter terrain data was obtained through HEC-RAS Mapper. The terrain data is from March 2020 and is the most current and most detailed regional data available. This elevation data was compared to the 2015 PAG elevation data and it was found the two datasets were in agreement within the project area. **Figure 2** shows the topography along with the extent of the model.
- The Pima County "soilshyd" file was used to map hydrologic soils groups within the area. It was found that most of the watershed is characterized as HSG C with some being HSG B, see **Figure 3**.
- Land use areas were defined to help define the Manning's n value and the impervious ratio. Curve numbers were defined for the hydrologic soil types using PC-HYDRO Table D-1 with a 20 percent vegetative cover density. See **Table 2** and **Figure 4**.
- The precipitation follows the SCS Type II, 3-hour distribution and utilizes NOAA-14 upper bounds precipitation table information. The 100-year, 3-hour depth is 3.19 inches. No aerial reduction was applied.
- There is an existing channel on the east side of Indian Agency Road which is crossed by two driveways with culverts, just east of the project site. These culverts were included within the model.

Table 2. Land use designations with Manning's n and composite CN

Land Use	Manning's Value	% Impervious	CN HSG B	CN HSG C
Alfalfa	0.065	0	83	88
Bare Desert	0.04	0	83	88
Clean Channel	0.035	0	83	88
Desert	0.05	0	83	N/A
Earthen Channel	0.045	0	83	88
High Density Residential	0.088	40	N/A	92
Low to Medium Density Residential	0.06	30	87.5	91
Mixed Ag.	0.08	0	83	88

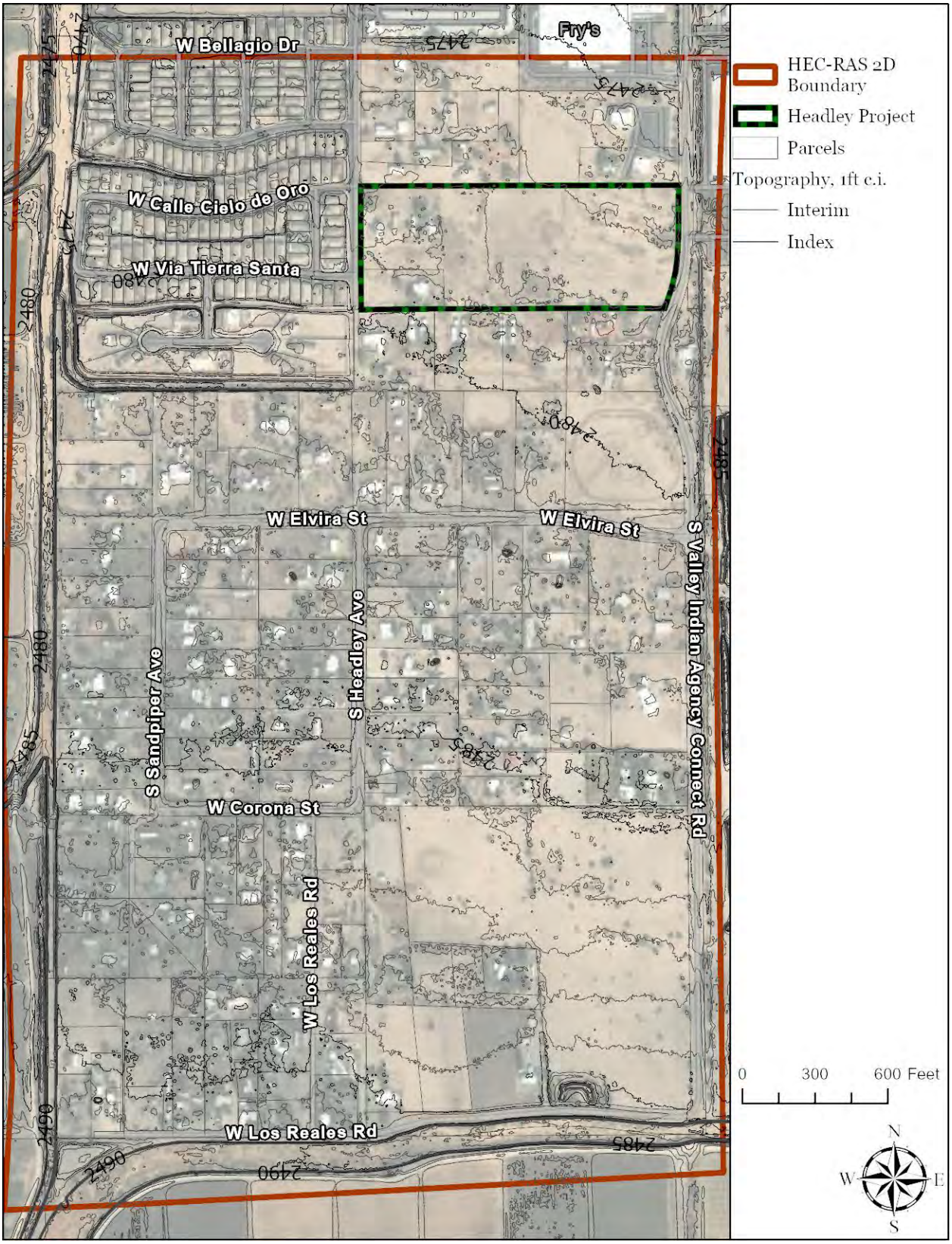


Figure 2. Model overview

Figure 3. Hydrologic soils group map

Figure 4. Land use map

The 100-year, existing conditions flood depths are shown on **Figure 5** and **Figure 6**. It was found that Elvira Street is a drainage divide with flow directed east along the southern side of Elvira Street.

Given that HEC-RAS rainfall runoff models are relatively new, the results were examined to make sure HEC-RAS was accurately computing the rainfall excess. For the area between Elvira Street and the project site, the CN is 87.5 at all locations. HEC-RAS identified a cumulative rainfall excess of 1.95 inches with 1.24 inches of infiltration. This was back checked using the standard SCS CN runoff equation:

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S}, \qquad S = \frac{1000}{CN} - 10$$

Plugging the CN=87.5 and P=3.19 into the above equation, the effective depth is 1.95 inches, and the infiltration is therefore 1.24 inches. HEC-RAS is accurately computing rainfall excess.

Figure 6 includes HEC-RAS flow records which are profile lines used to extract model results. These are used to record the peak discharges upstream, along-side, and downstream of the project. Three of these cross sections are equivalent to the PC-HYDRO sections listed earlier. The peak runoff at each of these locations is lower in the HEC-RAS analysis than in PC-HYDRO which is typical in these situations. A more intense, one hour rainfall event was modeled which generated slightly lower discharge values. A 24-hour duration storm was not modeled as the watershed upstream is too short.

Table 3. 100-year flow around project boundary

Concentration Point ID	100-year, 3-hour flow (cfs)	100-year, 3-hour flow (cfs)
US-1 (O-1)	11	10
US-2 (O-2)	11	10
US-3 (O-3)	17	16
US-4	7	7
DS-1	5	5
DS-2	4	5
DS-3	25	24
DS-4	34	30
DS-5	46	42
E-1	4	4
E-2	19	16
E-3	63	60
W-1	4	4

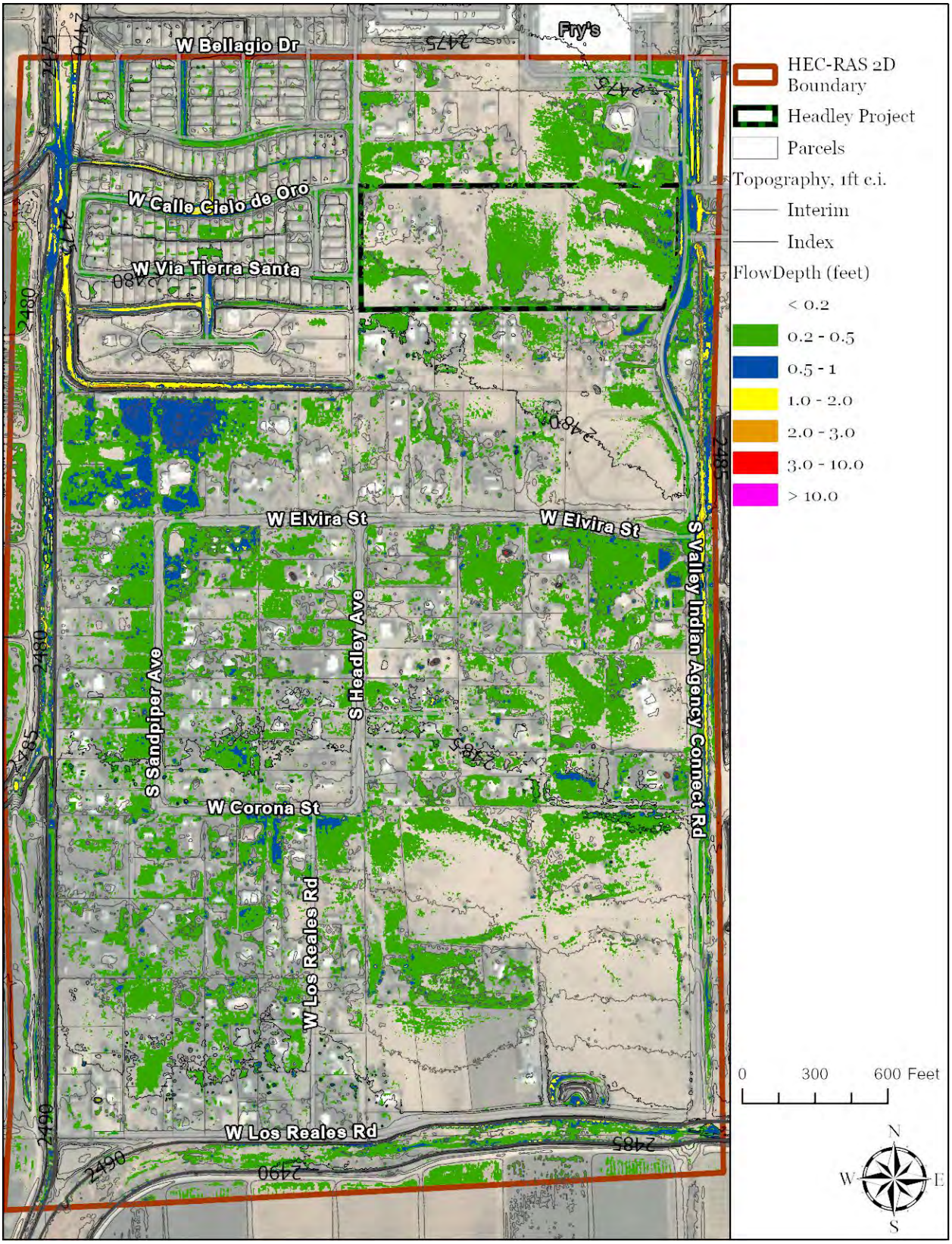


Figure 5. Existing 100-year flow depths across modeled area

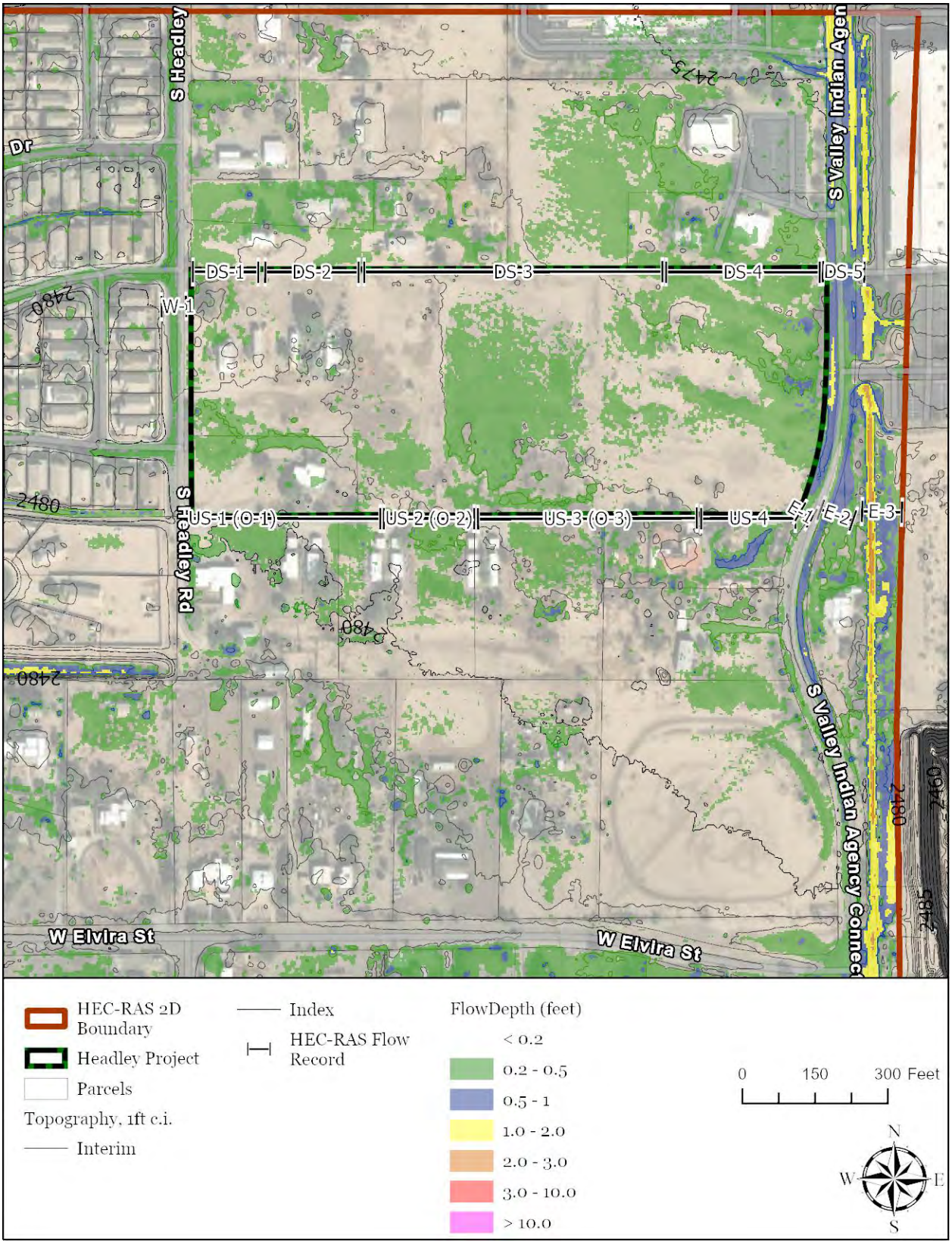


Figure 6. Existing 100-year flow depths near project area

With-Project HEC-RAS Rainfall Runoff Model

The existing conditions HEC-RAS model was updated to reflect proposed site grading. A proposed grading surface was provided by Bowman and this elevation file was merged with the USGS elevation to provide a composite terrain. The with-project geometry file is identical to the existing with the following revisions.

- With-project elevations are reflected within the site area.
- Manning's n values were adjusted. The south collector channel and the northern flow-return channels have a defined n value of 0.040.
- Culverts are placed between the basins. The basin B1 is drained via 3-18 inch CMP's. Basin B2 is also drained via 3-18" CMP's. The basin B3 is not intended to convey offsite flow and it is drained via 1-18" CMP.
- A weir is placed within the south collector channel, just east of Basin B1. This weir helps distribute flow into B1 and limit flow going east. The weir has a top elevation of 2478.5 and a length of 11 feet.

Table 4. 100-year, 3-hour flow through basins

Basin	Max WSE (ft)	Outlet	Discharge (cfs)
B1	2478.90	3-18" CMP. INV-US=2477.55	14
B2	2477.20	3-18" CMP. INV-US=2475.00	15
B3	2477.00	1-18" CMP. INV-US=2475.00	2

Table 5. 100-year flow in design condition

Concentration Point ID	100-year, 3-hour flow (cfs)	Change from existing (cfs)
US-1 (O-1)	12	0
US-2 (O-2)	10	0
US-3 (O-3)	15	0
US-4	11	0
DS-1	0	-5
DS-2	1	-3
DS-3	0	-4
DS-4	47	-4
DS-5	46	0
E-1	4	0
E-2	19	0
E-3	63	0
W-1	4	0

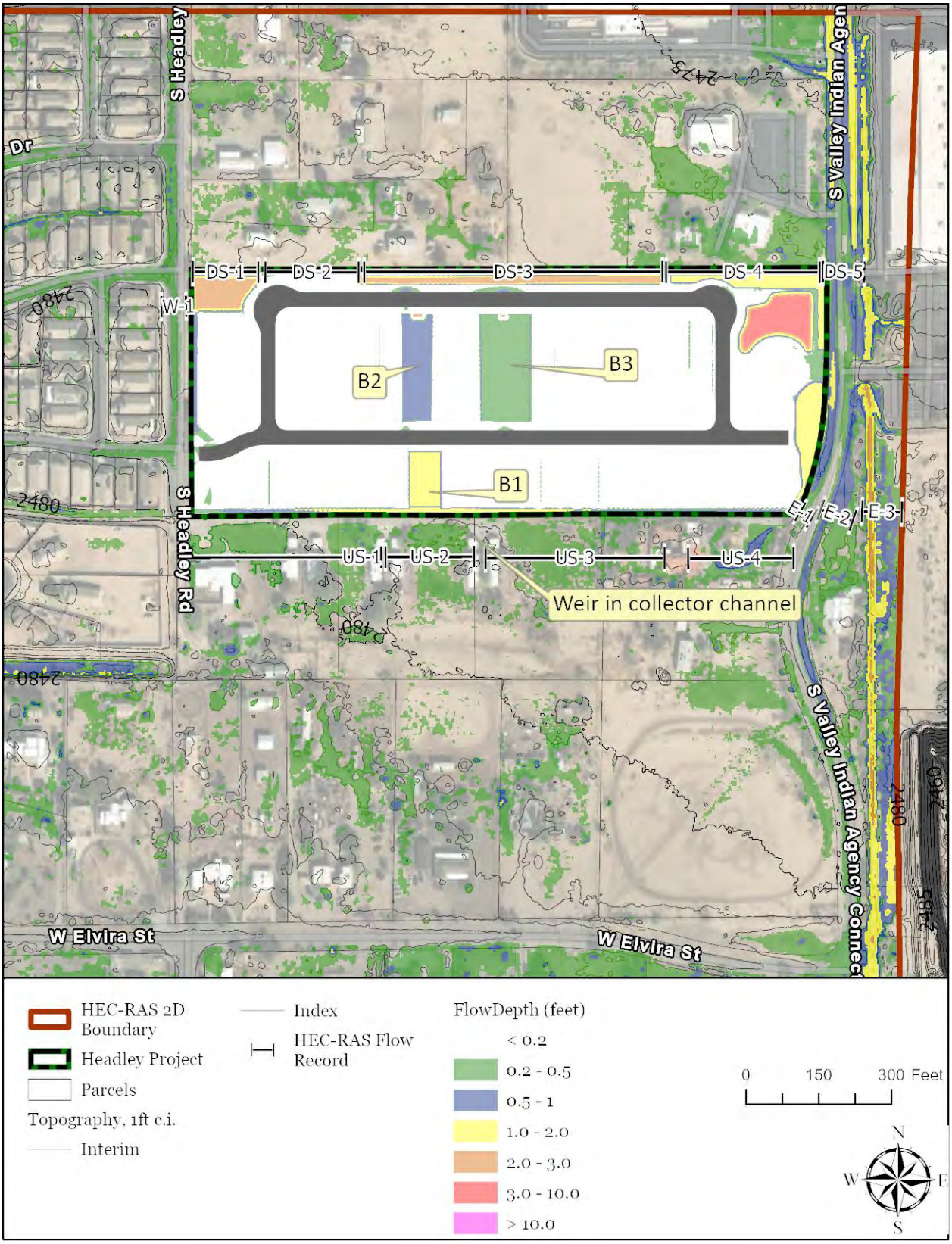


Figure 7. Design 100-year flow depths near project area

Conclusions

The offsite flow analysis performed in this assessment shows minor offsite flows impact this site. These flows originate a short distance upstream at Elvira Street. The peak discharges predicted by this assessment are lower than those predicted by PC-HYDRO. This is a common theme as PC-HYDRO uses a modified rational equation which tends to generate extremely high peak discharge values, especially in distributary flow areas. The HEC-RAS 2D analysis better accounts for surface conditions while developing a hydrograph which better reflects real-world conditions.

The design drainage solution intercepts this flow in a collector channel and distributes it with some of the offsite flow conveyed within the site through basin B1 and B2. This flow returns to the floodplain downstream with no adverse impact to flood depths downstream.

A HEC-RAS 2D model is submitted digitally with this report.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Ian P. Sharp, P.E.

Vice President, Project Manager

Appendix C

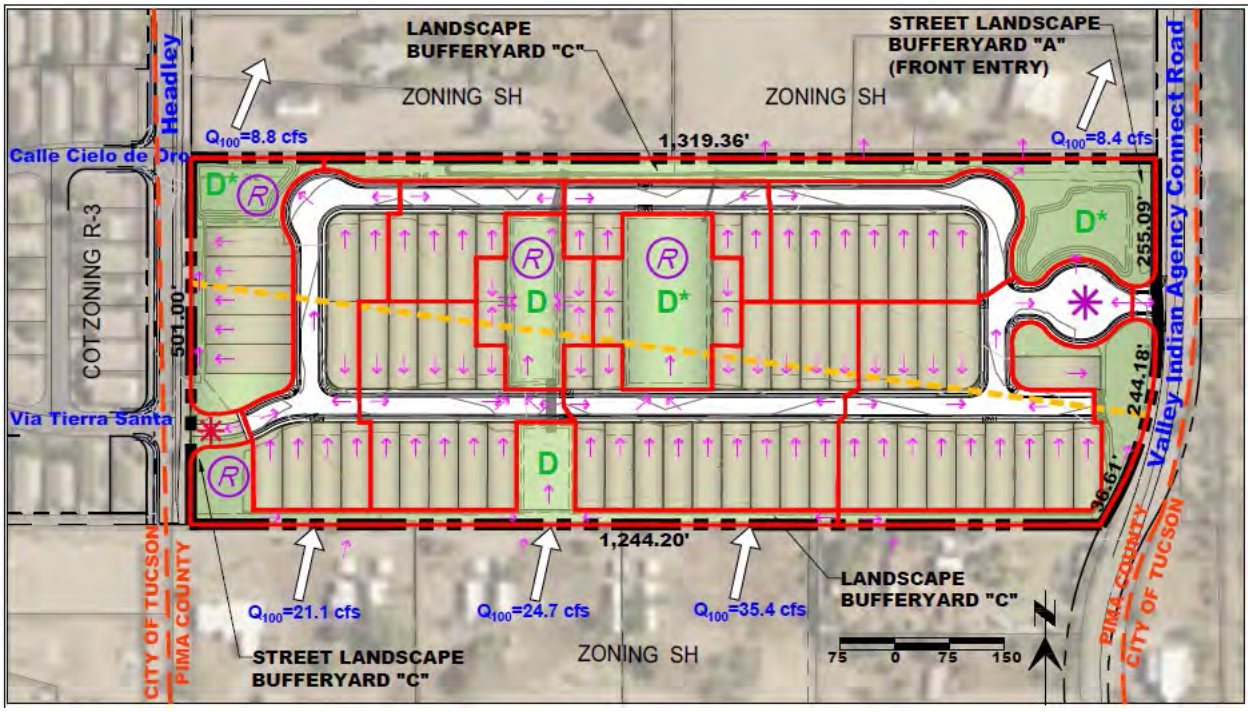
Preliminary Traffic Impact Study (TIS)

by

M. Esparza Engineering, LLC
June, 2023

Valencia-Headley
69 Single Family Residential Lots

Preliminary Traffic Impact Study



Prepared for:

ACM Ventures

Prepared for submittal to:

Pima County, AZ

Prepared by

M Esparza Engineering, LLC
2934 W. Salvia Drive
Tucson, AZ 85745

February 21, 2023
Updated June 12, 2023
Updated July 27, 2023

Valencia-Headley
69 Single Family Residential Lots
Preliminary Traffic Impact Study

Prepared for:

ACM Ventures

Prepared for submittal to:

Pima County, Arizona

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Phone: (520) 207-3358

Project No. 2022.35

Marcos Esparza, P.E., Principal

February 21, 2023

Updated June 12, 2023

Updated July 27, 2023

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Table of Contents

List of Exhibits

1. Introduction and Summary

Purpose of Report and Study Objectives

This study addresses the traffic impacts from a proposed sixty-nine lot single family residential project to be located south of Valencia Road between Headley Road and Valley Indian Agency Connect Road in Pima County, Arizona. This Traffic Impact Study (TIS) supports a rezoning application for this project.

This TIS has been prepared in accordance with *Pima County's Subdivision and Development Street Standards Manual.* This TIS has been prepared for a Category I Development – between 100 and 500 peak hour trips. A Category I TIS requires that the analysis addresses site access driveways and signalized and major unsignalized intersections within ¼ mile of the project site.

For the purposes of this report, we have conducted the analysis under the assumption that the project will be built out by the year 2025.

The analysis evaluates the impact on the adjacent roadway system. The project will add approximately 717 vehicle trips/day with 53 trips during the morning peak hour and 70 trips during the afternoon/evening peak hour.

Traffic volume data estimated by the Pima Association of Governments for the year 2021 shows approximately 48,988 vehicles per day (vpd) on Valencia Road, east of Valley Indian Agency Connect Road, and 46,371 vpd on Valencia Road west of Headley Road. Daily volumes were collected adjacent to the project site on Headley Road and on Valley Indian Agency Connect Road in 2022, and these volumes, respectively were 458 vpd and 416 vpd.

For the future development of background traffic volumes for the year 2025, we assumed a 2% increase from the 2021 and 2022 counts to 2025 volumes.

Project Location and Study Area

The project location is shown in Exhibit 1. The project site is in unincorporated Pima County although the jurisdictional boundaries of the City of Tucson are to the east west and north of the project site. The study area includes the site access driveway on Valley Indian Agency Connect Road, the signalized intersections of Valencia Road/Valley Indian Agency Connect Road/Oak Tree Drive and Valencia Road/Headley Road, and on Valencia Road and Valley Indian Agency Connect Road in the vicinity of the project. A secondary emergency access, with a cable or gate barrier, will be provided along the project frontage on Headley Road.

The project area is surrounded by mostly residential uses. There are retail and commercial uses to the north of the project area. The Tohono O Odham Nation, San Xavier District has jurisdiction on the land to the south of the project area.

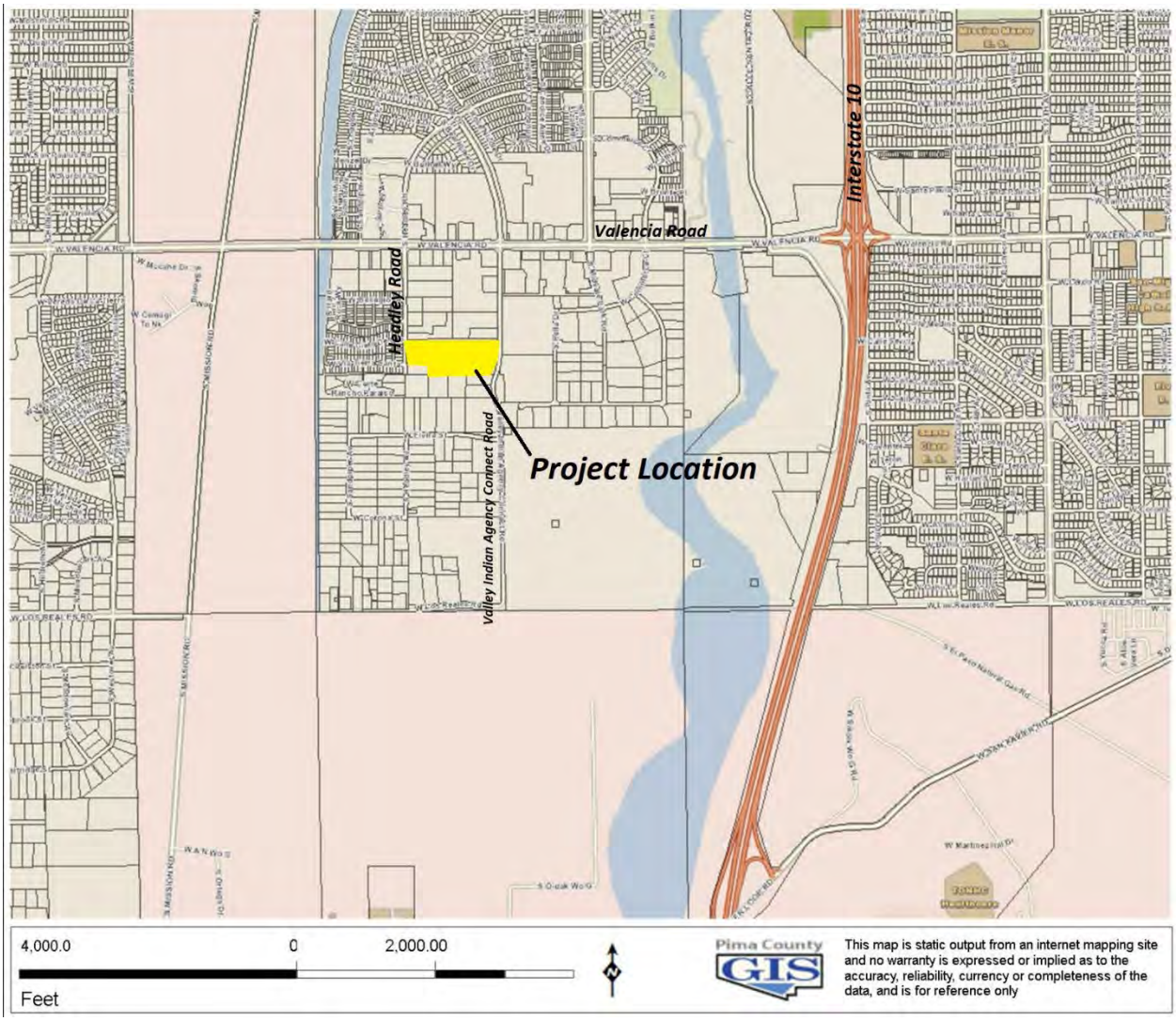
Development Description

The project includes 69 single-family residential lots. The preliminary development plan is shown in Exhibit 2.

Principal Findings

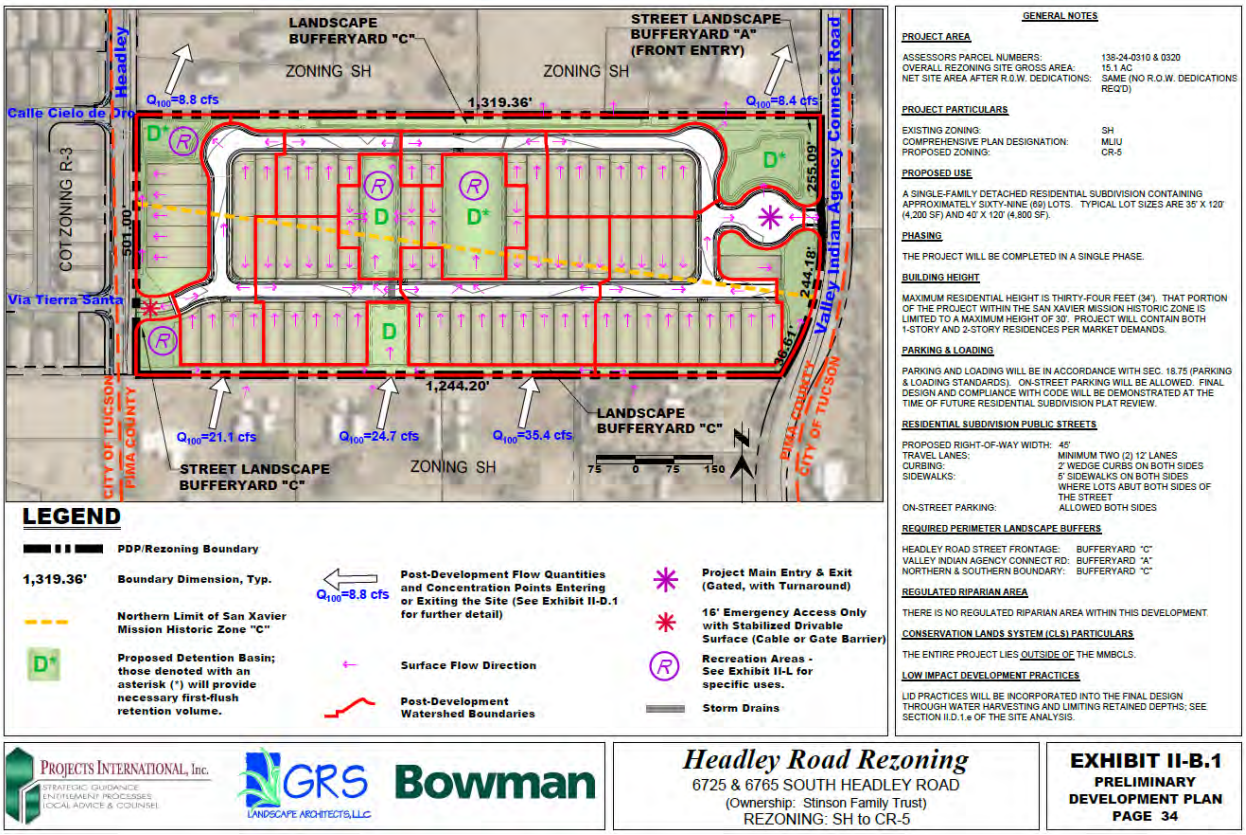
The project will add approximately 717 vehicle trips/day to the local roadway system with 53 trips during the morning peak hour and 70 trips during the afternoon/evening peak hour.

Exhibit 1 Project Vicinity



Based on the existing traffic at the project intersections, the assumption of a 2% traffic growth rate in the area and the trip generation and distribution of the project, the project trips will not degrade the operations of the project area intersections to levels less than future "no-project" conditions at the study area intersections and roadways.

Exhibit 2 Preliminary Development Plan



Conclusions and Recommendations

Conclusions

1. Based on the average trip rates for the project land use, the project generates 717 daily one-way trips, with 53 trips during the AM peak hour and 70 during the PM peak hour.
2. The projected traffic volumes produced by the project and the regional traffic growth rate will generally not degrade operating conditions at most locations beyond their projected conditions without the project.
3. The west driveway on Headley Road will be directly opposite Via Tierra Santa. The location of the access location will be directly opposite an existing driveway on the east side of Valley Indian Agency Connect Road.
4. The west access will be an emergency only driveway with a cable, or gate barrier. The east access will be for ingress and egress and will be gate controlled.
5. Turn lanes are not warranted at the project driveways.
6. The driveway on Headley Road does not have any sight distance constraint due to the straight alignment of Headley Road. For the driveway on Valley Indian Agency

Connect Road, it may be necessary to remove existing trees north and south of the project driveway to meet minimum sight distance criteria.

7. The daily volumes on the study area roadways will not exceed their LOS D daily volume capacities by the year 2025 with the project.

Recommendations

1. If necessary, remove existing trees north and south of the project driveway on Valley Indian Agency Connect Road to meet minimum sight distance criteria if necessary.
2. Roadway and subdivision design should conform to current Pima County standards.
3. All new traffic signs and markings must comply fully with the *Manual on Uniform Traffic Control Devices* and County requirements.

2. Proposed Development

Site Location

This study addresses the traffic impacts from a proposed sixty-nine lot single family residential project to be located south of Valencia Road between Headley Road and Valley Indian Agency Connect Road in Pima County, Arizona. The project location is shown in Exhibit 1.

Land Use and Intensity

The project includes sixty-nine (69) single family residential lots.

Site Plan

The site plan is shown on Exhibit 2.

Access Geometrics

There are two driveways shown on the site plan. The west access will be an emergency-only driveway with a cable, or gate barrier. The east access will be for ingress and egress and will be gate controlled.

The west driveway on Headley Road will be directly opposite Via Tierra Santa. The location of the east access location will be directly opposite an existing driveway on the east side of Valley Indian Agency Connect Road.

Development Phasing and Timing

The project is shown to be constructed in one phase. For the purposes of this TIS, we have assumed that 2025 would be the buildout year although market forces will determine the pace of development.

3. Study Area Conditions

Study Area

The study area for this project encompasses all site access driveways and major intersections within ¼ mile. The study area includes the site access driveway on Valley Indian Agency Connect Road, the signalized intersections of Valencia Road/ Valley Indian Agency Connect Road/Oak Tree Drive and Valencia Road/Headley Road and on Valencia Road, Valley Indian Agency Connect Road and Headley Road in the vicinity of the project.

Existing Land Use

The project area is within an area zoned Suburban Homestead (SH). There are some existing mobile-home residences on the project site which will be removed with the project. Surrounding zoning includes Residential (CR), Business (CB), Suburban Homestead (SH), Trailer Homesite (TH) and Transitional (TR).

The Midvale Christian Center Church is just north of the project area. A shopping center anchored by a Fry's store is located south of Valencia and north of this project. There are residential areas on the west side of the project and industrial areas east of the project.

Site Accessibility

There are two driveways shown on the site plan. The west access will be an emergency-only driveway. The east access will be for ingress and egress and will be gate controlled.

The following photographs (Exhibit 3) are of the study area roadways.

Exhibit 3 Ground Photographs

Looking North on Valley Indian Agency Connect Road. The project site is to the left.

Exhibit 3 (cont.) Ground Photographs

Looking North on Valley Indian Agency Connect Road. The project site is to the right.

Looking North on Headley Road. The project site is to the right.

4. Analysis of Existing Conditions

Physical Characteristics

Roadway Characteristics

Exhibit 4 (Roadway Inventory) lists the existing transportation features, such as bike routes, bus routes and sidewalks.

Exhibit 4 Roadway Inventory

Roadway Segment	Lanes	2021 Daily Volumes	Volumes Source	LOS D Daily Capacity (vpd)*	Speed Limit	Bike Route	Sun Tran Bus Route	Sidewalks	2022 ADT
Valencia Road, Mission Road to Headley Road	6	46,371	PAG	53,910	40	Bike Route with Striped Shoulder	Route 29	Yes	47,298
Valencia Road, Headley Road to Valley Indian Agency Connect Road	6	47,680	Estimated from PAG	53,910	40	Bike Route with Striped Shoulder	Route 29	Yes	48,633
Valencia Road, Valley Indian Agency Connect Road to Midvale Park Road	6	48,988	PAG	53,910	40	Bike Route with Striped Shoulder	Route 29	Yes	49,968
Headley Road, Just South of Valencia Road	2	3,484	Estimated from PAG/FDS Data	13,986	25	No	No	Yes, West Side	3,554
Headley Road, Adjacent to Project Site	2	458	FDS	10,656	25	No	No	Yes, West Side	467
Headley Road, North of Valencia Road	2	3,820	Estimated from PAG/FDS Data	13,320	25	Striped Shoulder	No	Yes	3,896
Valley Indian Agency Connect Road, Just South of Valencia Road	2	7,484	Estimated from PAG/FDS Data	16,727	40	No		Yes	7,634
Valley Indian Agency Connect Road, Adjacent to Project Site	2	416	FDS	12,744	40	No	No	No	424
Oak Tree Road, North of Valencia Road	2	7,580	PAG	13,986	25	Striped Shoulder	No	Yes	7,732

*FDOT Generalized Annual Average Daily Volumes Table, 2020.

The following describes the major roadways and intersections within the study area.

Valencia Road is designated an Urban Minor Arterial on the Federal Highway System, a High-Volume Arterial on Pima County' Major Streets Plan and a Scenic, Major Route on the county's Scenic Routes Plan. It has a posted speed limit of 40 mph. It is a divided six-lane arterial with bike lanes. There are sidewalks east of Cardinal Road. It provides direct access to residential and commercial uses along its route.

The western terminus of Valencia Road is at its intersection with SR 86 near Ryan Airfield. Valencia Road continues east through the project area with its eastern terminus just east of Houghton Road on the east side of Tucson. Nearby traffic signals are located at Mark Road, Camino de la Tierra, Camino de Oeste, Cardinal Avenue and Mission Road. Stop signs control access from all other cross streets intersecting Valencia Road.

Valley Indian Agency Connect Road south of Valencia Road to its terminus at Los Reales Road is a two-lane Minor Urban Collector. North of Valencia Road it continues as Oak Tree Drive. It has a posted speed limit of 40 mph through the study area. South of Valencia Road it has a two-

way left turn lane for about 650 feet; it then narrows to an undivided roadway to its southern terminus.

Its intersection with Valencia Road is signalized, but all intersections south of Valencia Road are unsignalized.

Headley Road south of Valencia Road to its terminus at south of Via Tierra Santa is a two-lane undivided Minor Urban Collector. North of Valencia Road it continues as Headley Road to its intersection with Midvale Park Road. It has a posted speed limit of 25 mph through the study area.

Its intersection with Valencia Road is signalized, but all intersections south of Valencia Road are unsignalized.

Existing Traffic Data

Traffic Counts

Field Data Services (FDS) of Arizona collected peak hour turning movement counts at the intersections of Valencia Road/Headley Road and Valencia Road/Valley Indian Agency Connect Road the week of September 26, 2022. These counts are illustrated in Exhibit 5.

Recorded roadway daily traffic volumes for Valencia Road in the vicinity of the project are available on PAG's website. The volumes are from 2021 and are adjusted volumes from 2019 recorded counts or estimated counts for 2019. FDS collected daily traffic volumes on Headley Road and on Valley Indian Agency Connect Road the week of September 19, 2022. Some volumes are estimated based on the recorded peak hour volumes at the intersections and the recorded volumes on Valencia Road. The volumes are shown in Exhibit 4.

Level of Service

Level of service (LOS) is a qualitative description of how well a roadway or intersection operates under prevailing traffic conditions. A grading system of A through F, similar to academic grades, is utilized. LOS A is free-flowing traffic, whereas LOS F is forced flow and extreme congestion. The Pima County standard for acceptable LOS is LOS D.

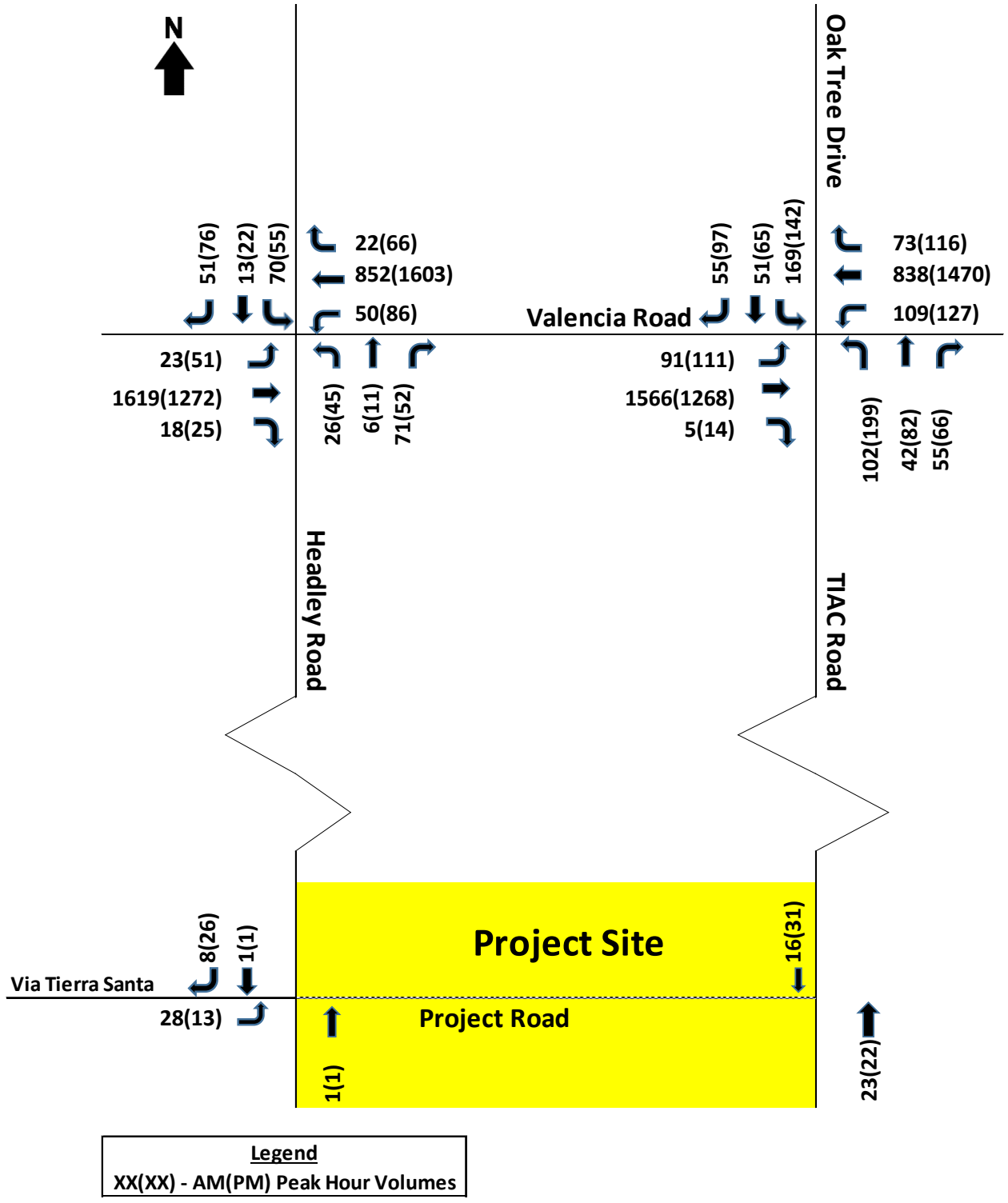
The intersections were evaluated for the weekday morning and evening peak periods based on the recorded turning movement volumes. The analyses were performed using Synchro, a software program that analyzed intersections based on the methodologies from the current Highway Capacity Manual. The LOS and delay results are summarized in Exhibit 6.

The signalized intersections of Valencia Road/Headley Road and Valencia Road/Valley Indian Agency Connect Road operate at LOS C or better during both peak hours.

For roadway segments, segment performance based on daily volumes has been estimated using the planning methods contained in the Florida Department of Transportation (FDOT) Level of Service Handbook. Exhibit 4 provides a summary of ADT and current roadway capacity at LOS D using FDOT LOS tables[1]. The table shows that all project roads are currently operating at LOS D or better.

[1] Florida Department of Transportation Generalized Annual Average Daily Volumes for Urbanized areas contained in *Quality / Level of Service Handbook, 2002*

Exhibit 5 Existing (Year 2022) Peak Hour Turning Movement Volumes



Traffic Safety History

ADOT collects crash data for all roadways within the state. We reviewed the data within the project study area for the most recently available five-year period (2017-2021). A summary of the crashes within the five-year period is provided in Exhibits 7a (intersection crashes) and 7b (roadway segment crashes).

Intersection Crashes

The intersections of Valencia/Oak Tree/Valley Indian Agency experienced the most crashes (54). The intersection of Valencia/Headley experienced 49 crashes during the five-year period. The crash rate at both intersections was 0.53 crashes per million entering vehicles. The predominant crash types at both intersections were "left-turn" and "rear-end." At both intersections about half of the crashes were not injury crashes.

2027-2021 crash rates are lower than the average signalized intersection crash rate (0.55 crashes/MEV) in the most recent (2016) Pima County Safety Management System Study.

Roadway Segment Crashes

On Valencia Road between Mission Road and Headley Road, there were thirteen recorded segment related crashes over the five-year period, with a five-year crash rate of 0.31 crashes per million vehicle miles (MVM). On Valencia Road between Headley Road and Midvale Park Road, there were twenty-five recorded segment related crashes over the five-year period, with a five-year crash rate of 0.37 crashes per MVM. Most crashes were rear end crashes, and most were non-injury crashes. There was one fatality between Headley Road and Midvale Park Road.

The average five-year crash rate for high volume roadways from the 2012-2016 five-year rates documented in the most recent (2016) Pima County Safety Management System Study was 1.00 crashes per MVM. The crash rates along Valencia Road for the 2017-2021 five-year period are well below the average rates from the Safety Management System Study for high volume roads.

Sight Distance

Sight visibility triangles will be included in the Projects' development plan, as required by the City of Tucson's development code. Based on sight distance criteria in the AASHTO Green Book, a vehicle turning left from a stop onto a 40-mph roadway should have 445 feet of sight distance. A vehicle turning right from a stop would need 385 feet of sight distance.

The driveway on Headley Road does not have any sight distance constraint due to the straight alignment of Headley Road. For the driveway on Valley Indian Agency Connect Road, it may be necessary to remove existing trees north and south of the project driveway to meet minimum sight distance criteria.

Exhibit 6 Intersection Level of Service – Existing Conditions

Existing

	Valencia/Headley			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left	22.7	C	42.1	D
Through/Right	24.2	C	26.3	C
Approach	*23.2*	*C*	*26.4*	*C*
Westbound				
Left	42.6	D	32	C
Through/Right	31.2	C	27.6	C
Approach	*31.4*	*C*	*27.4*	*C*
Northbound				
Left	21.1	C	24.8	C
Through	18.4	B	19.9	B
Right	20.2	C	20.9	C
Approach	*20.3*	*C*	*22.4*	*C*
Southbound				
Left	20.5	C	21.7	C
Through/Right	19.7	B	22.4	C
Approach	*20.1*	*C*	*22.2*	*C*
Intersection	***25.5***	***C***	***26.6***	***C***

	Valencia/VIAC/Oak Tree			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left	16.2	B	21.7	C
Through/Right	20.2	C	11.7	B
Approach	*17.4*	*B*	*11.7*	*B*
Westbound				
Left	22.6	C	18	B
Through/Right	21.9	C	36.8	D
Approach	*21.8*	*C*	*32.5*	*C*
Northbound				
Left	20.7	C	21.9	C
Through/Right	25.1	C	27	C
Approach	*23.3*	*C*	*24*	*C*
Southbound				
Left	21.2	C	21.6	C
Through	23.4	C	25.2	C
Right	23.8	C	26.6	C
Approach	*22.1*	*C*	*24*	*C*
Intersection	***19.6***	***B***	***23.2***	***C***

Exhibit 7a Collision History - Intersections

Valencia/Headley

Crash Type	2017	2018	2019	2020	2021	Total	%
Single Vehicle		1	1		1	3	6%
Angle		1		2	1	4	8%
Left Turn	3	4	3	4	2	16	33%
Rear End	3	5	3	3	3	17	35%
Sideswipe			1		2	3	6%
U-Turn					2	2	4%
Other		2		1	1	4	8%
Total	6	13	8	10	12	49	
Crash Rate (per MVE)	0.32	0.70	0.43	0.54	0.65	0.53	

Severity						Total	%
Fatal						0	0%
Bodily Injury	3	7	2	4	8	24	49%
Property Damage	3	6	6	6	4	25	51%

Valencia/Oak Tree/Valley Indian Agency

Crash Type	2017	2018	2019	2020	2021	Total	%
Single Vehicle					2	2	4%
Angle	3	1	2	2	1	9	17%
Left Turn	5	4	4	4	4	21	39%
Rear End	4	5	1	2	6	18	33%
Head On	1					1	2%
Sideswipe			1		1	2	4%
Other			1			1	2%
Total	13	10	9	8	14	54	
Crash Rate (per MVE)	0.64	0.49	0.44	0.39	0.69	0.53	

Severity						Total	%
Fatal						0	0%
Bodily Injury	5	8	6	2	7	28	52%
Property Damage	8	2	3	6	7	26	48%

Note: MVE = Million Vehicles Entering the intersection.

Exhibit 7b Collision History – Roadway Segments

Valencia: Mission Road to Headley Road

Crash Type	2017	2018	2019	2020	2021	Total	%
Single Vehicle		2		1		3	23%
Rear End	1	1	3	2	2	9	69%
Other					1	1	8%
Total	1	3	3	3	3	13	
Crash Rate (per MVM)	0.12	0.35	0.35	0.35	0.35	0.31	

Severity						Total	%
Fatal						0	0%
Bodily Injury		1	1	1	2	5	38%
Property Damage	1	2	2	2	1	8	62%

Valencia: Headley Road to Midvale Park Road

Crash Type	2017	2018	2019	2020	2021	Total	%
Single Vehicle		1		1		2	8%
Angle		3		1	1	5	20%
Left Turn					1	1	4%
Rear End	4	2	3	1	3	13	52%
Sideswipe	1	1				2	8%
Other	1			1		2	8%
Total	6	7	3	4	5	25	
Crash Rate (per MVM)	0.45	0.52	0.22	0.30	0.37	0.37	

Severity						Total	%
Fatal				1		1	4%
Bodily Injury	3	2	1	2	2	10	40%
Property Damage	3	5	2	1	3	14	56%

Note: MVM = Million Vehicle Miles

5. Projected Traffic

Site Traffic Forecasting

Trip Generation

The future traffic from the project is estimated using the trip rates contained in the Institute of Traffic Engineers' *Trip Generation Manual,* 11th Edition. The number of trips generated is the mathematical product of land use intensity (building square footage, number of dwelling units, etc.) and the trip generation rate. The result is the total number of one-way trips (not round trips) expected to be generated by the project. These trips represent the number of vehicles estimated to enter and leave the project. All of the estimates are based on trip rates from fitted curve equations.

We applied the trip rates from the *Trip Generation Manuel* to estimate trip generation for the residential uses. Exhibit 8 shows the trip rates and estimated trip generation. Based on the average trip rates for the project land use, the project generates 717 daily one-way trips, with 53 trips during the AM peak hour and 70 during the PM peak hour.

Exhibit 8 Trip Rates and Trip Generation

				Trip Generation Rates (Fitted Curve Equations)					
				Weekday AM		Weekday PM		Avg Weekday	
Land Use	Unit	No. Units	ITE Categ.	In	Out	In	Out	In	Out
Single Family Detached Unit	Dwelling Unit	69	210	Ln(T)=0.91Ln(X)+0.12		Ln(T)=0.94Ln(X)+0.27		Ln(T)=0.92Ln(X)+2.68	
				26%	74%	63%	37%	50%	50%
				Trip Generation					
				Weekday AM		Weekday PM		Avg Weekday	
Land Use	Unit	No. Units	ITE Categ.	In	Out	In	Out	In	Out
Single Family Detached Unit	Dwelling Unit	69	210	53		70		717	
				14	39	44	26	359	359

Note: AM, PM Rates based on Peak Hour of Adjacent Street Traffic (7-9 AM; 4-6 PM)

Trip Distribution and Assignment

We distributed the site traffic with 60% to the east on Valencia Road, 30% to the west, 5% to the north on Headley Road north of Valencia Road, and 5% to the north on Oak Tree Drive. The distribution percentages are shown in Exhibit 9. The site trips at the project driveway and the off-site intersections are shown in Exhibit 10.

Exhibit 9 Trip Distribution

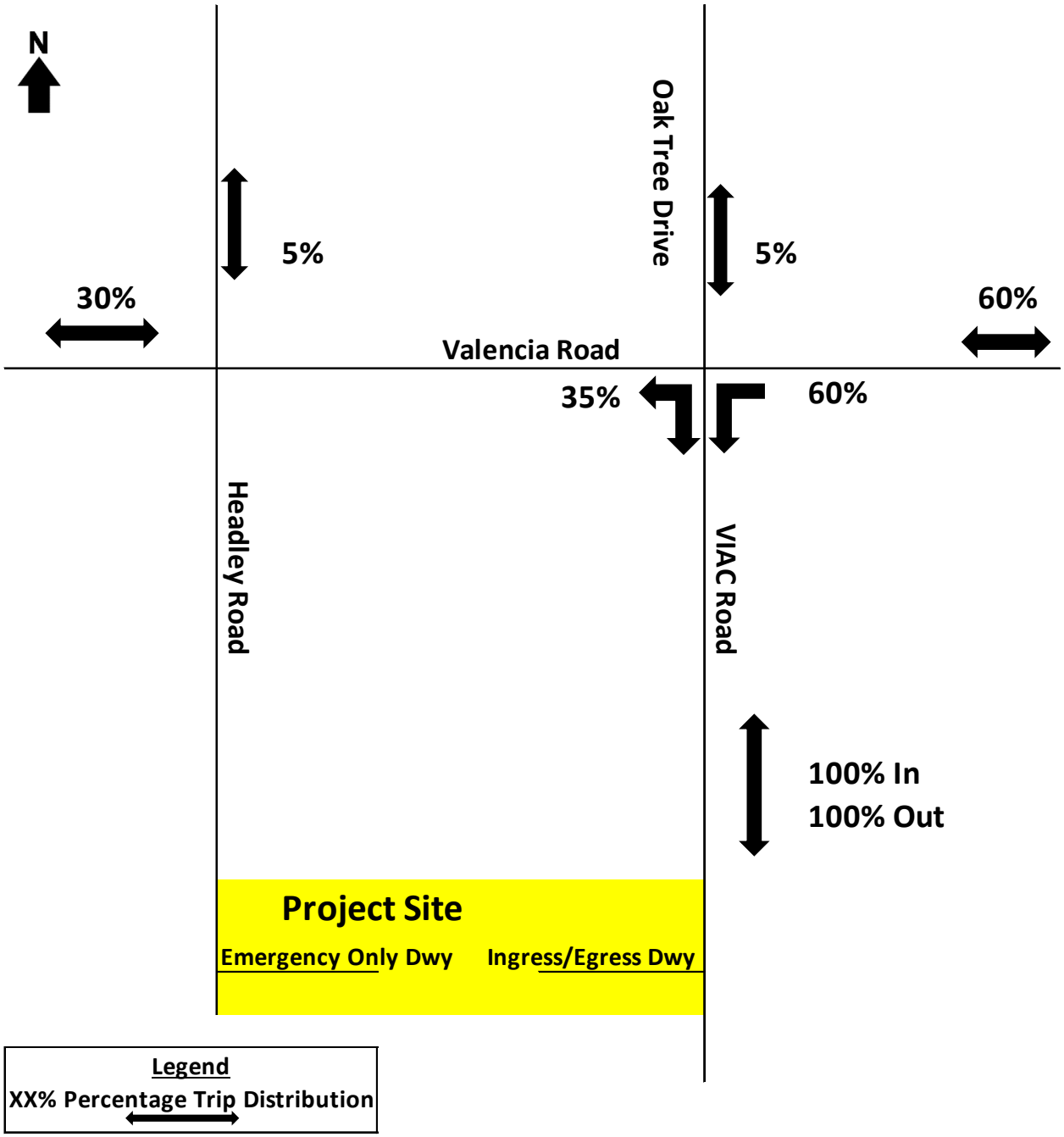
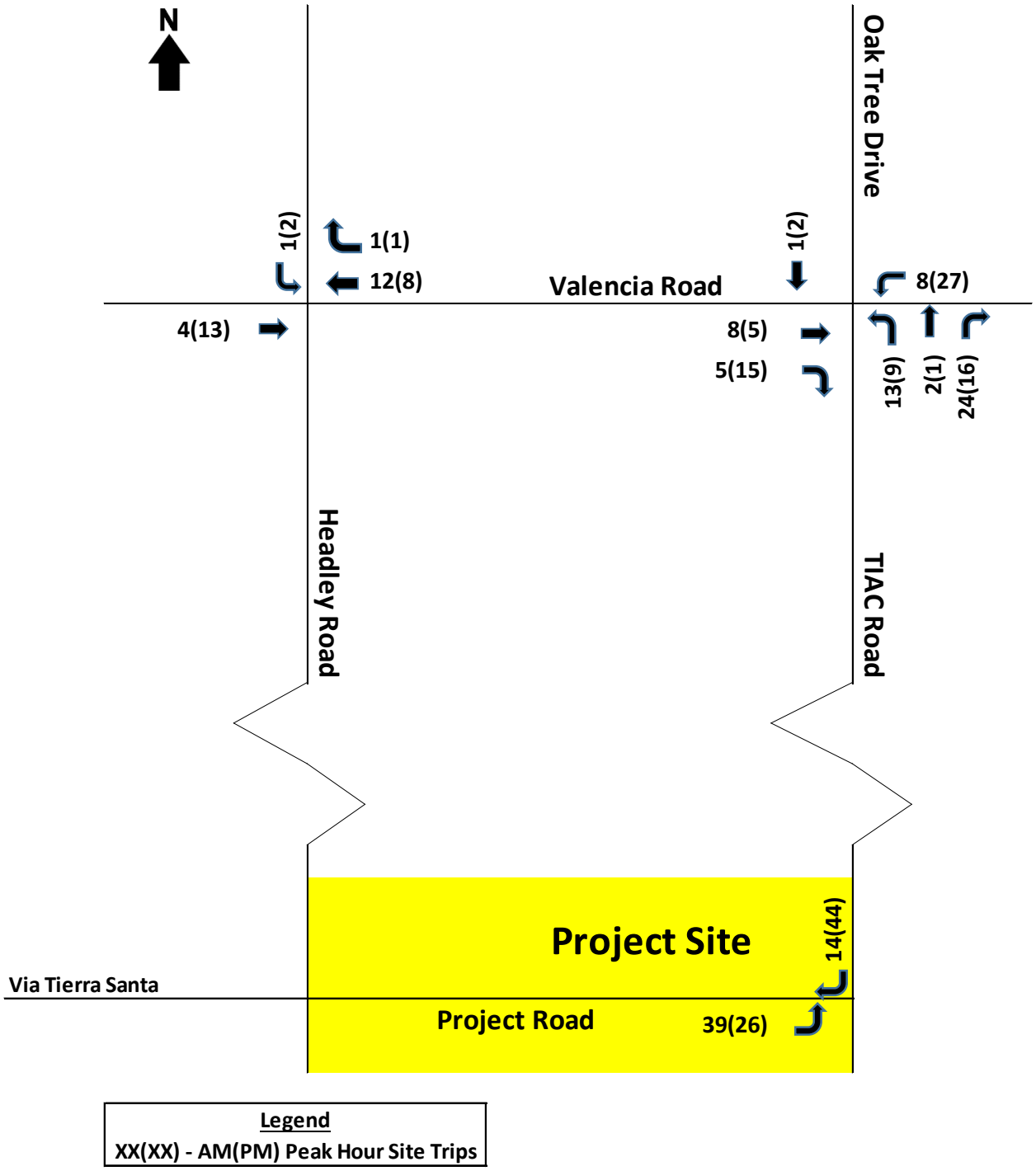


Exhibit 10 Site Traffic Assignment

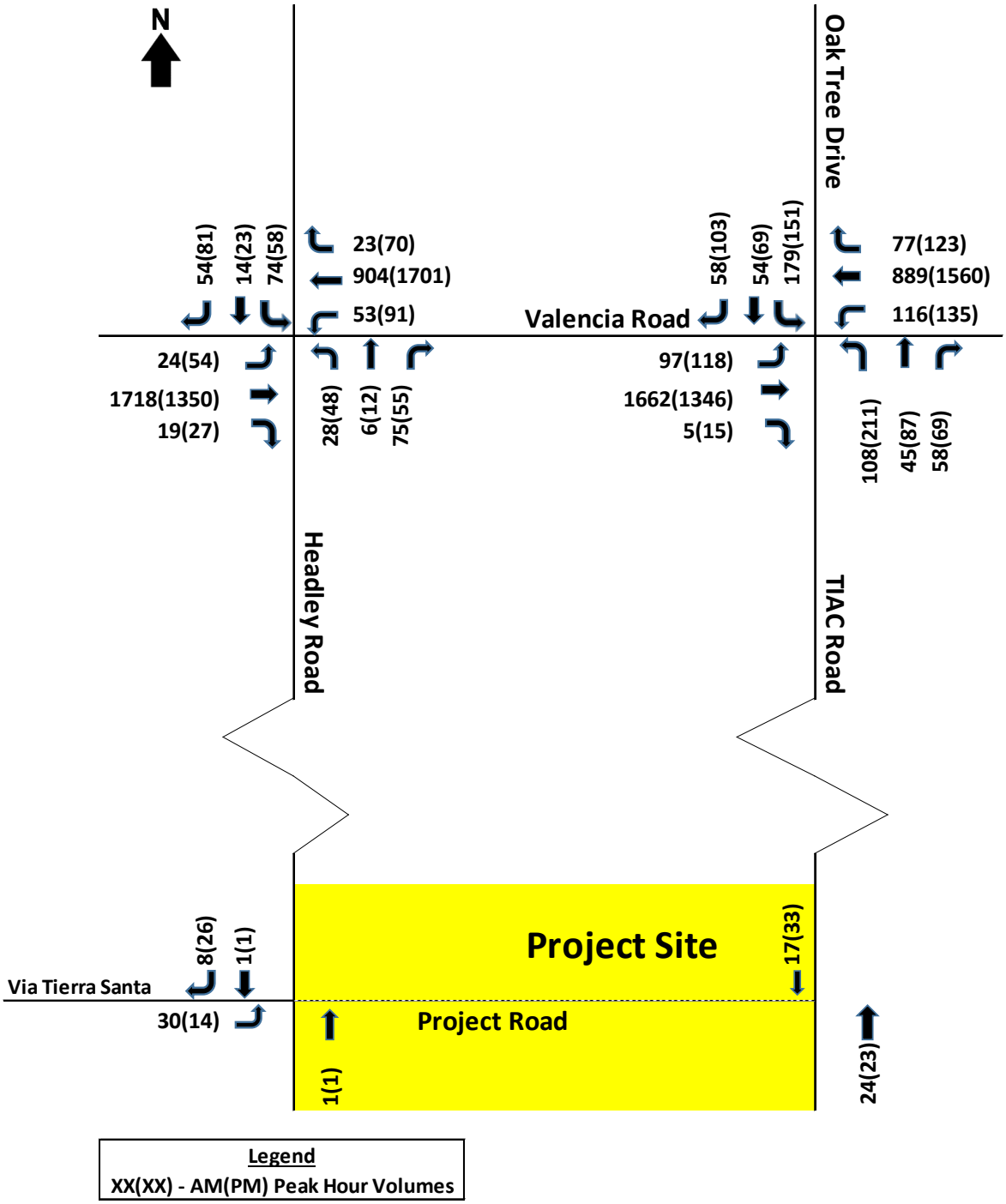


Non-Site Traffic Forecasting

Projections of Non-Site Traffic

We estimated year 2025 traffic volumes based on a 2%/year growth rate. Exhibit 11 shows the future turning movement intersection counts under the no-project condition for the year 2025.

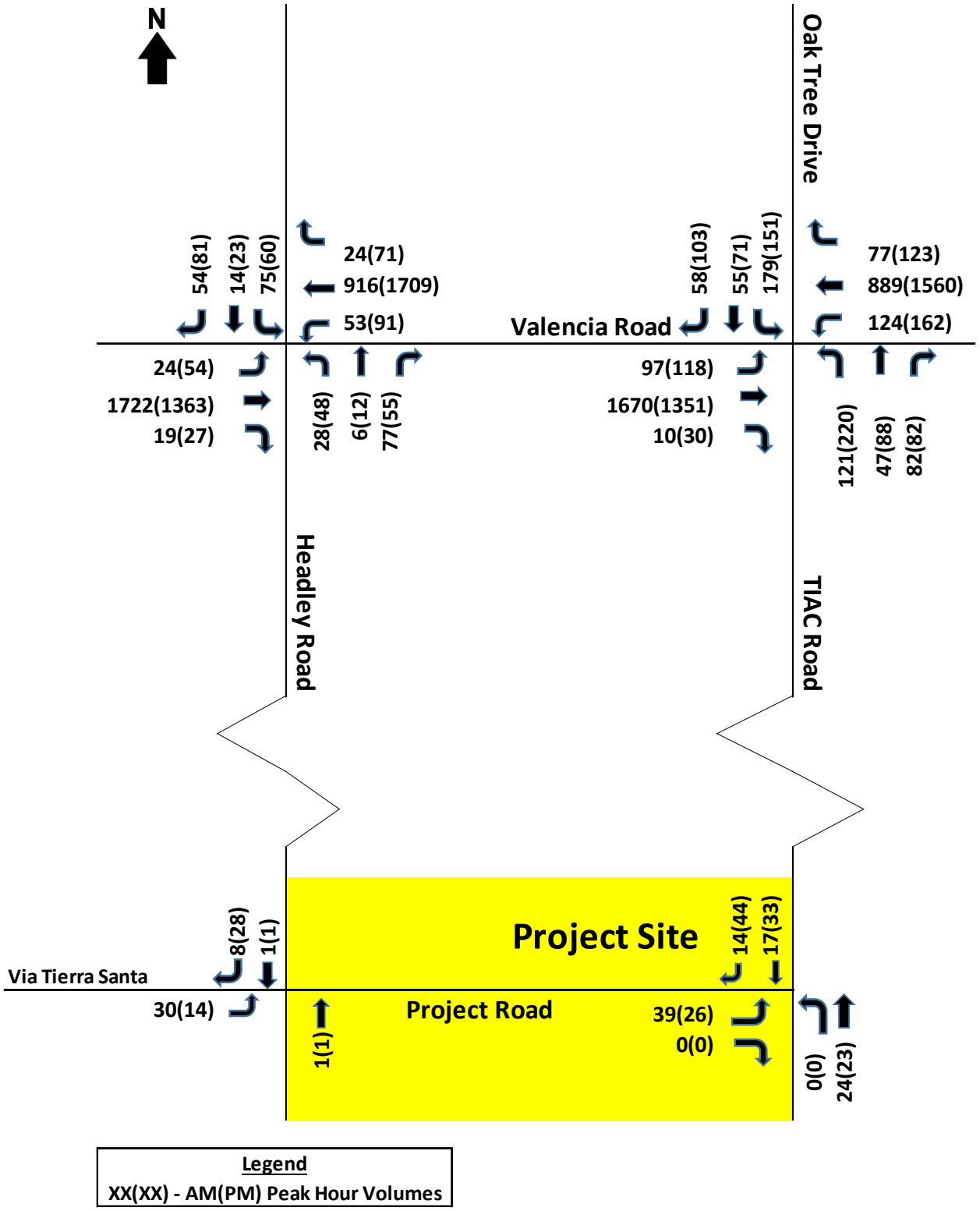
Exhibit 11 Future Traffic Volumes – Year 2025 (No Project)



Total Traffic

We added the site traffic volumes to the no-project traffic volumes for the year 2025. The resulting total peak hour turning volumes at the project intersections and driveway are illustrated in Exhibit 12.

Exhibit 12 Future Traffic Volumes – Year 2025 (With Project)



6. Traffic and Improvement Analysis

Site Access

The west access on Headley Road will be an emergency-only driveway with a cable, or gate barrier. The east access will be for ingress and egress and will be gate controlled.

The west driveway on Headley Road will be directly opposite Via Tierra Santa. The location of the east access location will be directly opposite an existing driveway on the east side of Valley Indian Agency Connect Road.

Level of Service Analysis

HCS analyses were performed for the no-project and with-project conditions for the year 2025. The results of the intersection analysis are shown in Exhibits 13 and 14. All movements at the project intersections will operate at LOS D or better with the project.

Roadway Capacity Evaluation

Daily site trips were added to the projected background volumes for the year 2025 (Exhibit 15). Based on FDOT criteria, all project roadways will not exceed their theoretical LOS D daily capacities with or without the influence of the project through the year 2025. Site trips on Valencia Road will be less than one percent of the future total daily volumes.

Turn Lane Storage Length Analysis

Synchro calculates the 95th percentile queue for intersection turn lanes. The calculated queue lengths for 2025 With Project peak hour conditions at the existing turn lanes are shown in Exhibit 16. The existing marked turn lane lengths are also provided in the exhibit. We applied Pima County minimum lane lengths where the calculated back of queue estimate was less than the minimum standard length.

For most locations where there are existing turn lanes, the existing marked storage lengths are longer than the projected 95th percentile queue lengths calculated by the Synchro program. The exceptions are at the following locations:

- Valencia/Valley Indian Agency Road/Oak Tree: Northbound Left Turn Lane. The projected 2025 With Project 95th percentile queue length is 159 feet with an existing 110-foot marked turn lane.
- Valencia/Valley Indian Agency Road/Oak Tree: Southbound Left Turn Lane. The projected 2025 With Project 95th percentile queue length is 132 feet in the AM peak hour and 105 feet in the PM peak hour with an existing 100-foot marked turn lane.

At both locations, the existing (Year 2022) queues exceed the marked turn lane lengths. Both approaches have two-way left turn lanes before the marked lanes that provide the additional storage length.

Exhibit 13 Intersection Level of Service (2025 No Project)

2025 No Project

	Valencia/Headley			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left	21.8	C	42.2	D
Through/Right	24.3	C	25.7	C
Approach	*23.1*	*C*	*25.8*	*C*
Westbound				
Left	42	D	32.2	C
Through/Right	27.2	C	27.5	C
Approach	*27.5*	*C*	*27.2*	*C*
Northbound				
Left	22.5	C	26.5	C
Through	19.4	B	21	C
Right	21.5	C	22.1	C
Approach	*21.7*	*C*	*23.8*	*C*
Southbound				
Left	21.8	C	23	C
Through/Right	21	C	23.9	C
Approach	*21.4*	*C*	*23.6*	*C*
Intersection	***24.4***	***C***	***26.4***	***C***

	Valencia/VIAC/Oak Tree			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left	15.6	B	22.9	C
Through/Right	21.8	C	11.9	B
Approach	*18.5*	*B*	*11.8*	*B*
Westbound				
Left	23.2	C	18.2	B
Through/Right	21.4	C	41.1	D
Approach	*21.4*	*C*	*35.6*	*D*
Northbound				
Left	21.4	C	23.1	C
Through/Right	27.6	C	28.3	C
Approach	*24.4*	*C*	*25.3*	*C*
Southbound				
Left	22.9	C	22.5	C
Through	24.8	C	26	C
Right	25.3	C	27.1	C
Approach	*23.7*	*C*	*24.9*	*C*
Intersection	***20.3***	***C***	***24.8***	***C***

Exhibit 14 Intersection Level of Service (2025 With Project)

2025 With Project

	Valencia/Headley			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left	21.9	C	42.2	D
Through/Right	24.3	C	25.7	C
Approach	*23.1*	*C*	*25.7*	*C*
Westbound				
Left	42	D	32.3	C
Through/Right	27.0	C	27.5	C
Approach	*27.3*	*C*	*27.2*	*C*
Northbound				
Left	22.6	C	26.6	C
Through	19.5	B	21	C
Right	21.5	C	22.1	C
Approach	*21.7*	*C*	*23.9*	*C*
Southbound				
Left	21.9	C	23.2	C
Through/Right	21	C	24	C
Approach	*21.4*	*C*	*23.7*	*C*
Intersection	***24.3***	***C***	***26.4***	***C***

	Valencia/VIAC/Oak Tree			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left	15.5	B	23	C
Through/Right	22.2	C	14.4	B
Approach	*18.8*	*B*	*13.7*	*B*
Westbound				
Left	24.2	C	20.4	B
Through/Right	21.0	C	41.1	D
Approach	*21.2*	*C*	*35.5*	*D*
Northbound				
Left	22	C	23.5	C
Through/Right	29.2	C	29.1	C
Approach	*25.7*	*C*	*25.9*	*C*
Southbound				
Left	23.6	C	22.7	C
Through	25.2	C	26.1	C
Right	25.7	C	27.7	C
Approach	*24.3*	*C*	*25*	*C*
Intersection	***20.6***	***C***	***25.6***	***C***

Exhibit 14 (cont.) Intersection Level of Service (2025 With Project)

	VIAC/East Dwy			
	AM		PM	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound				
Left/Right	8.9	A	9.1	A
Northbound				
Left/Right	0	A	0	A

Exhibit 15 Future Daily Traffic Volumes

Roadway Segment	Lanes	LOS D Daily Capacity (vpd)*	2022 ADT	2025 No Project ADT	Site Trips	2025 With Project ADT	% Site Trips in 2025
Valencia Road, Mission Road to Headley Road	6	53,910	47,298	50,193	215	50,409	0.43%
Valencia Road, Headley Road to Valley Indian Agency Connect Road	6	53,910	48,633	51,610	251	51,861	0.48%
Valencia Road, Valley Indian Agency Connect Road to Midvale Park Road	6	53,910	49,968	53,026	430	53,456	0.80%
Headley Road, Just South of Valencia Road	2	13,986	3,554	3,771	0	3,771	0.00%
Headley Road, Adjacent to Project Site	2	10,656	467	496	0	496	0.00%
Headley Road, North of Valencia Road	2	13,320	3,896	4,135	36	4,171	0.86%
Valley Indian Agency Connect Road, Just South of Valencia Road	2	16,727	7,634	8,101	717	8,818	8.13%
Valley Indian Agency Connect Road, Adjacent to Project Site	2	12,744	424	450	717	1,167	61.42%
Oak Tree Road, North of Valencia Road	2	13,986	7,732	8,205	36	8,241	0.44%

*FDOT Generalized Annual Average Daily Volumes Table, 2020.

Exhibit 16 Year 2025 With Project 95th Percentile Queue Lengths

		95th Percentile Queue Length (ft)		
Intersection	**Lane**	**AM Peak Hour**	**PM Peak Hour**	**Existing Storage Length (ft)**
Valencia/Headley	EB Left	13	23	210
	WB Left	19	37	240
	NB Left	34	55	100
	NB Right	19	24	100
	SB Left	75	61	100
Valencia/VIAC/Oak Tree	EB Left	55	105	200
	WB Left	88	117	200
	NB Left	93	159**	110
	SB Left	132*	105***	100
	SB Right	1	29	100

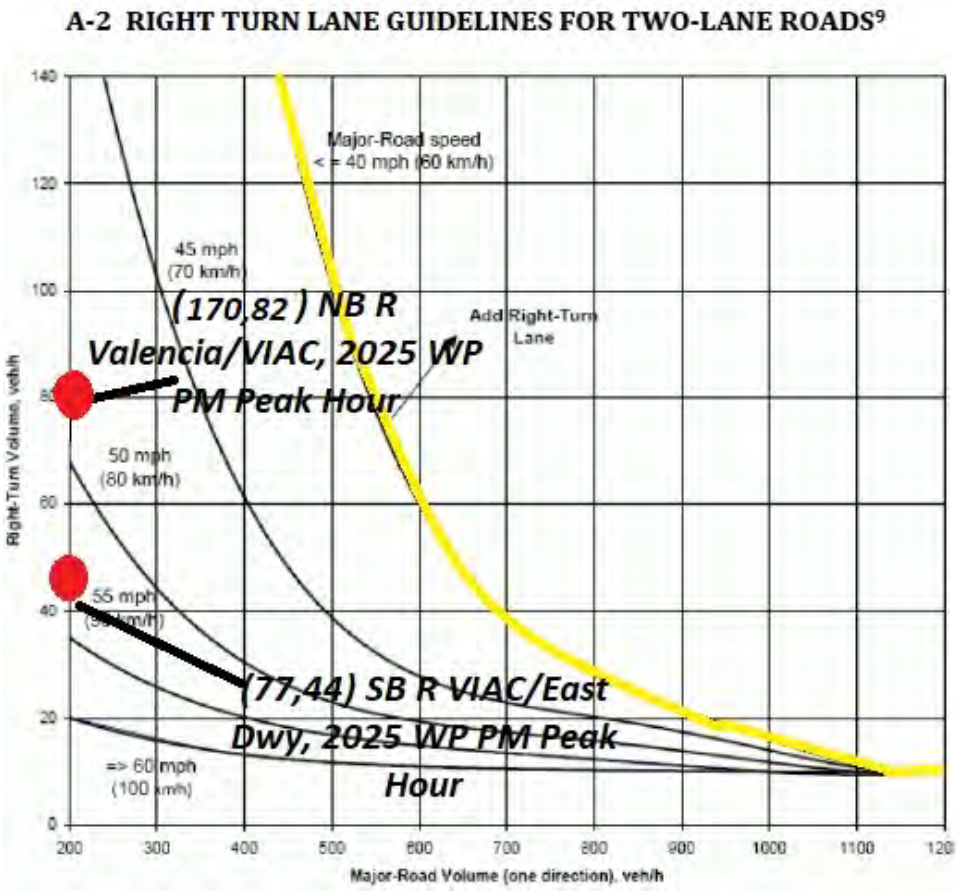
*Existing queue length is 125', exceeding storage length.
**Existing queue length is 144', exceeding storage length.
***Existing queue length is 100'.

Turn-Lane Warrants Analysis

Pima County's Subdivision and Development Street Standards provides turn lane warrant guidelines for County roadways. Results from the turn lane warrant analysis are shown in Exhibit 17.

A southbound right turn lane into the east project driveway on Valley Indian Agency Connect Road is also not warranted. A northbound right turn lane on Valley Indian Agency Connect Road at Valencia Road is also not warranted.

Exhibit 17 Right Turn Lane Warrant Criteria (Two Lane Roads)



Gated Access

The development will have gated access. Pima County includes guidance on the placement of gates at the entrances to residential developments in their *Subdivision and Development Street Standards*:

> "Gated entrances shall be allowed for commercial/industrial developments such as apartments where on-site parking areas are privately maintained and for residential subdivisions with private streets. Gated entries shall meet the following requirements:
>
> - Stopping locations (keypads, card-readers, guard shacks, etc.) shall be set back from the right-of-way of the cross street to avoid interfering with through traffic and to provide protection for entering vehicles.
> - The gate may not encroach into the travel lane when open.
> - Each side of a median-divided roadway/driveway shall be at least 16 feet wide to provide accessibility of emergency vehicles.
> - Any equipment or obstructions such as keypads or card-readers shall be installed in a median island.

- The design of the entrance shall allow vehicles that do not go past the gate to turn around without interfering with other traffic.
- The turnaround area shall be located within the development boundary outside of the collector or arterial right-of-way.

Gate Queuing Analysis

Using a basic Poisson distribution methodology, it is possible to estimate the average queue at a gate. The entering volume of 44 entering volumes per hour for the Valley Indian Agency Connect Road gated access was applied to this analysis. Based on the number of entering vehicles, it is likely that the entry will remain open during the highest peak and allow two to three vehicles in per entry "call." This would allow the second (or third) vehicle to enter without activating the gate. Given this assumption, the entering volume applied in this analysis is 22 vehicles (half of the projected entering vehicles). We also assume that it takes an average of 30 seconds for a driver to activate the gate and to enter. The following queue equation is applied:

$$E(n) = \rho/(1- \rho) = \lambda/(\mu - \lambda),$$

Where:

λ = arrival rate, in this case 22 vehicles/hour, or 0.37/minute,
μ = service rate, in this case 30 seconds per vehicle/hour, or 2 vehicles/minute,
$\rho = \lambda/\mu = 0.18$. This is the traffic intensity, or utilization factor.

This equation estimates the average number of queued vehicles plus the vehicle entering the gate.

The average number of vehicles in the queue is then:

$0.18/(1-0.18) = 0.22$ vehicles on average at the gate.

The probability that there will be three vehicles at the gate is:

$P(4) = \rho^3 \text{ X } P(0)$, where P(0) is the probability of no queue, and $P(0) = 1- \rho = 0.82$,

$= 0.18^3 \text{ X } 0.82 = 0.005$, or a 0.5% probability of a queue of 3 vehicles.

The probability of three or more vehicles queued decreases rapidly, so it can be estimated that there is a 99.5% probability that entering vehicles will not back up to the street if storage for at least three vehicles is provided between the gate and the street. For this reason, it is recommended that there be enough space for three vehicles to queue before the gate keypad.

Pedestrian and Bicycle Considerations

Facilities for pedestrians and bicycle traffic within the project site are assumed to be built according to the Pima County Subdivision and Development Standards.

There are nearby transit stops on Valencia Road and the County may require sidewalks and/or bicycle lanes along Headley Road and Valley Indian Agency Connect Road to promote access to these transit stops.

7. Conclusions and Recommendations

Conclusions

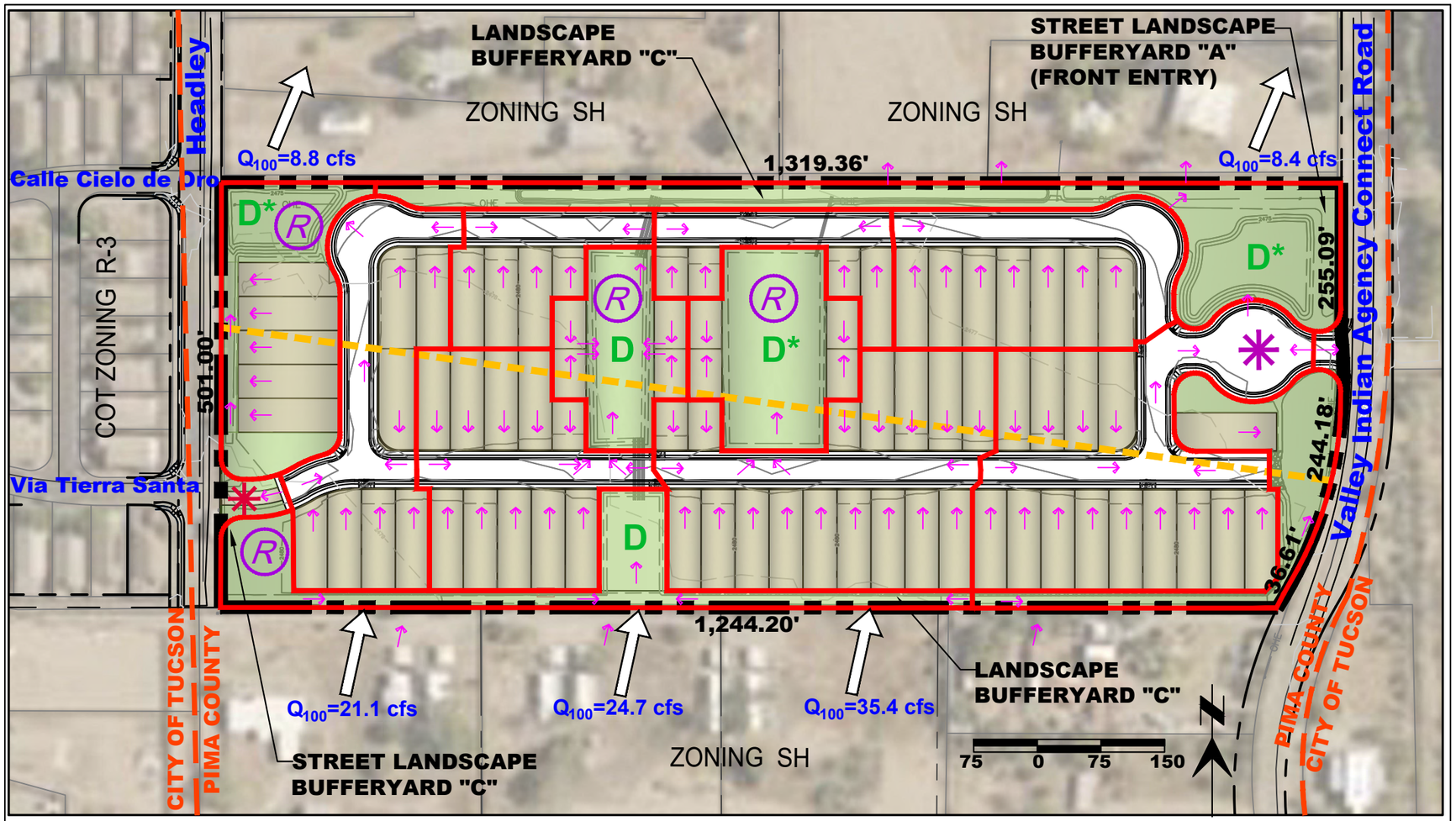
1. Based on the average trip rates for the project land use, the project generates 717 daily one-way trips, with 53 trips during the AM peak hour and 70 during the PM peak hour.
2. The projected traffic volumes produced by the project and the regional traffic growth rate will generally not degrade operating conditions at most locations beyond their projected conditions without the project.
3. The west driveway on Headley Road will be directly opposite Via Tierra Santa. The location of the access location will be directly opposite an existing driveway on the east side of Valley Indian Agency Connect Road.
4. The west access will be an emergency only driveway with a cable or gate barrier. The east access will be for ingress and egress and will be gate controlled.
5. Turn lanes are not warranted at the project driveways.
6. The driveway on Headley Road does not have any sight distance constraint due to the straight alignment of Headley Road. For the driveway on Valley Indian Agency Connect Road, it may be necessary to remove existing trees north and south of the project driveway to meet minimum sight distance criteria.
7. The daily volumes on the study area roadways will not exceed their LOS D daily volume capacities by the year 2025 with the project.

Recommendations

1. If necessary, remove existing trees north and south of the project driveway on Valley Indian Agency Connect Road to meet minimum sight distance criteria if necessary.
2. Roadway and subdivision design should conform to current Pima County standards.
3. All new traffic signs and markings must comply fully with the *Manual on Uniform Traffic Control Devices* and County requirements.

APPENDIX

- Site Plan
- Traffic Data
- Synchro Analysis Sheets



LEGEND

- PDP/Rezoning Boundary
- 1,319.36' — Boundary Dimension, Typ.
- Northern Limit of San Xavier Mission Historic Zone "C"
- D* — Proposed Detention Basin; those denoted with an asterisk (*) will provide necessary first-flush retention volume.
- Q_{100}=8.8 cfs — Post-Development Flow Quantities and Concentration Points Entering or Exiting the Site (See Exhibit II-D.1 for further detail)
- Surface Flow Direction
- Post-Development Watershed Boundaries
- Project Main Entry & Exit (Gated, with Turnaround)
- 16' Emergency Access Only with Stabilized Drivable Surface (Cable or Gate Barrier)
- R — Recreation Areas - See Exhibit II-L for specific uses.
- Storm Drains

GENERAL NOTES

PROJECT AREA

ASSESSORS PARCEL NUMBERS:	138-24-0310 & 0320
OVERALL REZONING SITE GROSS AREA:	15.1 AC
NET SITE AREA AFTER R.O.W. DEDICATIONS:	SAME (NO R.O.W. DEDICATIONS REQ'D)

PROJECT PARTICULARS

EXISTING ZONING:	SH
COMPREHENSIVE PLAN DESIGNATION:	MLIU
PROPOSED ZONING:	CR-5

PROPOSED USE

A SINGLE-FAMILY DETACHED RESIDENTIAL SUBDIVISION CONTAINING APPROXIMATELY SIXTY-NINE (69) LOTS. TYPICAL LOT SIZES ARE 35' X 120' (4,200 SF) AND 40' X 120' (4,800 SF).

PHASING

THE PROJECT WILL BE COMPLETED IN A SINGLE PHASE.

BUILDING HEIGHT

MAXIMUM RESIDENTIAL HEIGHT IS THIRTY-FOUR FEET (34'). THAT PORTION OF THE PROJECT WITHIN THE SAN XAVIER MISSION HISTORIC ZONE IS LIMITED TO A MAXIMUM HEIGHT OF 30'. PROJECT WILL CONTAIN BOTH 1-STORY AND 2-STORY RESIDENCES PER MARKET DEMANDS.

PARKING & LOADING

PARKING AND LOADING WILL BE IN ACCORDANCE WITH SEC. 18.75 (PARKING & LOADING STANDARDS). ON-STREET PARKING WILL BE ALLOWED. FINAL DESIGN AND COMPLIANCE WITH CODE WILL BE DEMONSTRATED AT THE TIME OF FUTURE RESIDENTIAL SUBDIVISION PLAT REVIEW.

RESIDENTIAL SUBDIVISION PUBLIC STREETS

PROPOSED RIGHT-OF-WAY WIDTH:	45'
TRAVEL LANES:	MINIMUM TWO (2) 12' LANES
CURBING:	2' WEDGE CURBS ON BOTH SIDES
SIDEWALKS:	5' SIDEWALKS ON BOTH SIDES WHERE LOTS ABUT BOTH SIDES OF THE STREET
ON-STREET PARKING:	ALLOWED BOTH SIDES

REQUIRED PERIMETER LANDSCAPE BUFFERS

HEADLEY ROAD STREET FRONTAGE:	BUFFERYARD "C"
VALLEY INDIAN AGENCY CONNECT RD:	BUFFERYARD "A"
NORTHERN & SOUTHERN BOUNDARY:	BUFFERYARD "C"

REGULATED RIPARIAN AREA

THERE IS NO REGULATED RIPARIAN AREA WITHIN THIS DEVELOPMENT.

CONSERVATION LANDS SYSTEM (CLS) PARTICULARS

THE ENTIRE PROJECT LIES OUTSIDE OF THE MMBCLS.

LOW IMPACT DEVELOPMENT PRACTICES

LID PRACTICES WILL BE INCORPORATED INTO THE FINAL DESIGN THROUGH WATER HARVESTING AND LIMITING RETAINED DEPTHS; SEE SECTION II.D.1.e OF THE SITE ANALYSIS.

PROJECTS INTERNATIONAL, Inc.
STRATEGIC GUIDANCE
ENTITLEMENT PROCESSES
LOCAL ADVICE & COUNSEL

GRS LANDSCAPE ARCHITECTS, LLC

Bowman

Headley Road Rezoning

6725 & 6765 SOUTH HEADLEY ROAD
(Ownership: Stinson Family Trust)
REZONING: SH to CR-5

EXHIBIT II-B.1
PRELIMINARY DEVELOPMENT PLAN
PAGE 34

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Headley Rd	DATE:	09/28/22	LOCATION:	Tucson
E-W STREET:	Valencia Rd	DAY:	WEDNESDAY	PROJECT#	22-1539-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	0	1	3	0	1	3	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	7	3	23	25	2	7	4	387	0	9	159	8	634
7:15 AM	9	2	26	21	0	5	6	409	4	18	178	3	681
7:30 AM	8	2	13	20	4	18	1	448	8	12	231	6	771
7:45 AM	3	1	13	13	1	15	8	383	5	7	222	5	676
8:00 AM	6	1	19	16	8	13	8	379	1	13	221	8	693
8:15 AM	5	1	12	13	3	5	8	322	5	19	226	6	625
8:30 AM	9	2	25	14	7	9	12	290	0	19	227	1	615
8:45 AM	7	2	14	8	5	8	9	328	4	13	216	8	622
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	54	14	145	130	30	80	56	2946	27	110	1680	45	5317
Approach %	25.35	6.57	68.08	54.17	12.50	33.33	1.85	97.26	0.89	5.99	91.55	2.45	
App/Depart	213	/	115	240	/	167	3029	/	3221	1835	/	1814	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	26	6	71	70	13	51	23	1619	18	50	852	22	2821
2025 NP	28	6	75	74	14	54	24	1718	19	53	904	23	
Site Trips				1				4			12	1	
2025 WP	28	6	75	75	14	54	24	1722	19	53	916	24	
Approach %	25.24	5.83	68.93	52.24	9.70	38.06	1.39	97.53	1.08	5.41	92.21	2.38	
PEAK HR. FACTOR:		0.696			0.798			0.908			0.928		0.915

CONTROL: Signal
COMMENT 1:
GPS: 32.133874, -111.007536

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Headley Rd	DATE:	09/28/22	LOCATION:	Tucson
	0				
E-W STREET:	Valencia Rd	DAY:	WEDNESDAY	PROJECT#	22-1539-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	0	1	3	0	1	3	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	11	1	14	9	2	15	10	316	6	13	433	14	844
4:15 PM	6	3	8	11	3	10	4	264	8	18	411	15	761
4:30 PM	11	5	8	18	3	13	7	302	10	21	404	7	809
4:45 PM	9	1	14	15	3	15	12	317	14	20	407	15	842
5:00 PM	10	4	10	11	4	16	9	307	5	15	394	17	802
5:15 PM	14	3	13	13	7	18	15	312	3	34	442	14	888
5:30 PM	12	3	15	16	8	27	15	336	3	17	360	20	832
5:45 PM	12	1	10	16	10	13	8	260	6	27	363	12	738
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	85	21	92	109	40	127	80	2414	55	165	3214	114	6516
Approach %	42.93	10.61	46.46	39.49	14.49	46.01	3.14	94.70	2.16	4.72	92.01	3.26	
App/Depart	198	/	215	276	/	260	2549	/	2615	3493	/	3426	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	45	11	52	55	22	76	51	1272	25	86	1603	66	3364
2025 NP	48	12	55	58	23	81	54	1350	27	91	1701	70	
Site Trips				2				13			8	1	
2025 WP	48	12	55	60	23	81	54	1363	27	91	1709	71	
Approach %	41.67	10.19	48.15	35.95	14.38	49.67	3.78	94.36	1.85	4.90	91.34	3.76	
PEAK HR. FACTOR:	0.900			0.750			0.952			0.895			0.947

CONTROL:	Signal
COMMENT 1:	0
GPS:	32.133874, -111.007536

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Oak Tree / Indian Agency	DATE:	09/28/22	LOCATION:	Tucson
E-W STREET:	Valencia Rd	DAY:	WEDNESDAY	PROJECT#	22-1539-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	1	1	3	0	1	3	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	12	9	12	38	6	6	10	416	1	16	152	8	686
7:15 AM	16	9	20	64	10	12	19	421	0	13	157	9	750
7:30 AM	16	10	17	51	17	17	18	456	0	21	220	16	859
7:45 AM	19	9	12	45	18	18	28	370	2	34	208	20	783
8:00 AM	31	12	12	36	8	11	18	408	2	23	185	16	762
8:15 AM	36	11	14	37	8	9	27	332	1	31	225	21	752
8:30 AM	32	10	12	26	11	9	16	306	6	23	189	15	655
8:45 AM	27	13	11	35	14	16	20	294	2	24	179	11	646
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	189	83	110	332	92	98	156	3003	14	185	1515	116	5893
Approach %	49.48	21.73	28.80	63.60	17.62	18.77	4.92	94.64	0.44	10.19	83.43	6.39	
App/Depart	382	/	355	522	/	291	3173	/	3445	1816	/	1802	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	102	42	55	169	51	55	91	1566	5	109	838	73	3156
2025 NP	108	45	58	179	54	58	97	1662	5	116	889	77	
Site Trips	13	2	24		1			8	5	8			
2025 WP	121	47	82	179	55	58	97	1670	10	124	889	77	
Approach %	51.26	21.11	27.64	61.45	18.55	20.00	5.48	94.22	0.30	10.69	82.16	7.16	
PEAK HR. FACTOR:		0.816			0.809			0.877			0.921		0.919

CONTROL:	Signal
COMMENT 1:	
GPS:	32.133838, -111.003095

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Oak Tree / Indian Agency 0	DATE:	09/28/22	LOCATION:	Tucson
E-W STREET:	Valencia Rd	DAY:	WEDNESDAY	PROJECT#	22-1539-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	1	1	3	0	1	3	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	44	20	21	41	12	32	26	258	10	33	362	32	891
4:15 PM	34	21	22	30	19	24	23	291	7	38	415	36	960
4:30 PM	45	17	14	36	17	31	18	325	4	38	376	30	951
4:45 PM	53	24	16	38	19	21	30	290	8	32	367	34	932
5:00 PM	52	12	16	38	12	23	26	271	1	35	332	25	843
5:15 PM	50	22	15	32	17	26	28	345	2	26	414	27	1004
5:30 PM	44	24	15	34	17	27	27	362	3	34	357	30	974
5:45 PM	55	31	23	29	22	23	33	232	1	38	332	31	850
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	377	171	142	278	135	207	211	2374	36	274	2955	245	7405
Approach %	54.64	24.78	20.58	44.84	21.77	33.39	8.05	90.58	1.37	7.89	85.06	7.05	
App/Depart	690	/	627	620	/	445	2621	/	2794	3474	/	3539	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	199	82	62	142	65	97	111	1268	14	127	1470	116	3753
2025 NP	211	87	66	151	69	103	118	1346	15	135	1560	123	
Site Trips	9	1	16		2			5	15	27			
2025 WP	220	88	82	151	71	103	118	1351	30	162	1560	123	
Approach %	58.02	23.91	18.08	46.71	21.38	31.91	7.97	91.03	1.01	7.41	85.81	6.77	
PEAK HR. FACTOR:	0.922			0.974			0.888			0.917			0.935

CONTROL: Signal
COMMENT 1: 0
GPS: 32.133838, -111.003095

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Headley Rd	DATE:	09/28/22	LOCATION:	Tucson
E-W STREET:	Via Tierra Santa	DAY:	WEDNESDAY	PROJECT#	22-1539-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	1	0	0	0	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	0	0	1	11	0	0	0	0	0	12
7:15 AM	0	1	0	0	1	3	7	0	0	0	0	0	12
7:30 AM	0	0	0	0	0	4	4	0	0	0	0	0	8
7:45 AM	0	0	0	0	0	0	6	0	0	0	0	0	6
8:00 AM	0	0	0	0	0	4	7	0	0	0	0	0	11
8:15 AM	0	0	0	0	0	2	1	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	2	9	0	0	0	0	0	11
8:45 AM	0	1	0	0	0	2	7	0	0	0	0	0	10
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	2	0	0	1	18	52	0	0	0	0	0	73
Approach %	0.00	100.00	0.00	0.00	5.26	94.74	100.00	0.00	0.00	####	####	####	
App/Depart	2	/	54	19	/	1	52	/	0	0	/	18	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	0	1	0	0	1	8	28	0	0	0	0	0	38
2025 NP Site Trips	0	1	0	0	1	8	30	0	0	0	0	0	
2025 WP	0	1	0	0	1	8	30	0	0	0	0	0	
Approach %	0.00	100.00	0.00	0.00	11.11	88.89	100.00	0.00	0.00	####	####	####	

PEAK HR. FACTOR:	0.250	0.563	0.636	0.000	0.792

CONTROL: 1-Way Stop (EB)
COMMENT 1:
GPS: 32.129091, -111.007625

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Headley Rd	DATE:	09/28/22	LOCATION:	Tucson
	0				
E-W STREET:	Via Tierra Santa	DAY:	WEDNESDAY	PROJECT#	22-1539-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	1	0	0	0	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	0	0	4	3	0	0	0	0	0	7
4:15 PM	0	0	0	0	0	4	1	0	0	0	0	0	5
4:30 PM	0	0	0	0	0	8	4	0	0	0	0	0	12
4:45 PM	0	0	0	0	1	9	4	0	0	0	0	0	14
5:00 PM	0	1	0	0	0	3	2	0	0	0	0	0	6
5:15 PM	0	0	0	0	0	6	3	0	0	0	0	0	9
5:30 PM	0	0	0	0	1	5	4	0	0	0	0	0	10
5:45 PM	0	0	0	0	0	3	1	0	0	0	0	0	4
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	1	0	0	2	42	22	0	0	0	0	0	67
Approach %	0.00	100.00	0.00	0.00	4.55	95.45	100.00	0.00	0.00	####	####	####	
App/Depart	1	/	23	44	/	2	22	/	0	0	/	42	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	0	1	0	0	1	26	13	0	0	0	0	0	41
2025 NP	0	1	0	0	1	28	14	0	0	0	0	0	
Site Trips													
2025 WP	0	1	0	0	1	28	14	0	0	0	0	0	
Approach %	0.00	100.00	0.00	0.00	3.70	96.30	100.00	0.00	0.00	####	####	####	

PEAK HR. FACTOR:	0.250	0.675	0.813	0.000	0.732

CONTROL:	1-Way Stop (EB)
COMMENT 1:	0
GPS:	32.129091, -111.007625

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

Volumes for: Wednesday, September 28, 2022 City: Tucson Project #: 22-1539-004

Location: Headley Rd north of Via Tierra Santa

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	4		3				
00:15	0		0					12:15	2		4				
00:30	1		1					12:30	1		7				
00:45	1	2	0	1			3	12:45	6	13	5	19			32
01:00	0		0					13:00	3		8				
01:15	0		0					13:15	2		5				
01:30	0		0					13:30	2		9				
01:45	0	0	1	1			1	13:45	1	8	6	28			36
02:00	0		0					14:00	4		3				
02:15	0		0					14:15	1		2				
02:30	0		0					14:30	2		5				
02:45	1	1	0	0			1	14:45	5	12	2	12			24
03:00	0		0					15:00	2		4				
03:15	0		0					15:15	3		1				
03:30	0		0					15:30	2		5				
03:45	0	0	0	0				15:45	2	9	2	12			21
04:00	0		0					16:00	3		4				
04:15	0		1					16:15	2		5				
04:30	0		0					16:30	4		9				
04:45	0	0	0	1			1	16:45	4	13	10	28			41
05:00	1		0					17:00	3		3				
05:15	1		0					17:15	3		6				
05:30	0		0					17:30	4		6				
05:45	1	3	1	1			4	17:45	1	11	3	18			29
06:00	2		2					18:00	1		7				
06:15	5		1					18:15	0		5				
06:30	4		0					18:30	1		2				
06:45	7	18	1	4			22	18:45	2	4	6	20			24
07:00	11		1					19:00	1		3				
07:15	8		4					19:15	3		2				
07:30	6		5					19:30	2		1				
07:45	6	31	0	10			41	19:45	1	7	1	7			14
08:00	8		4					20:00	0		2				
08:15	1		2					20:15	1		1				
08:30	9		2					20:30	0		0				
08:45	8	26	3	11			37	20:45	0	1	1	4			5
09:00	4		3					21:00	0		0				
09:15	8		2					21:15	0		1				
09:30	5		5					21:30	1		0				
09:45	9	26	2	12			38	21:45	0	1	0	1			2
10:00	6		4					22:00	0		2				
10:15	3		1					22:15	1		1				
10:30	2		5					22:30	0		0				
10:45	5	16	2	12			28	22:45	0	1	0	3			4
11:00	8		6					23:00	0		1				
11:15	7		4					23:15	0		0				
11:30	6		5					23:30	0		0				
11:45	3	24	8	23			47	23:45	2	2	0	1			3
Total Vol.		147		76			**223**			82		153			**235**

GPS Coordinates: 32.129366, -111.007612

Daily Totals

NB	SB	EB	WB	Combined
229	229			**458**

	AM			PM		
Split %	65.9%	34.1%	**48.7%**	34.9%	65.1%	**51.3%**
Peak Hour	06:45	11:00	**11:00**	16:30	13:00	**16:30**
Volume	32	23	**47**	14	28	**42**
P.H.F.	0.73	0.72	**0.84**	0.88	0.78	**0.75**

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

Volumes for: Wednesday, September 28, 2022 City: Tucson Project #: 22-1539-005

Location: Indian Agency north of Healey Rd alignment

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	1		0					12:00	7		3				
00:15	0		0					12:15	4		2				
00:30	0		0					12:30	2		1				
00:45	0	1	0	0			1	12:45	5	18	4	10			28
01:00	1		0					13:00	2		5				
01:15	2		1					13:15	6		8				
01:30	1		0					13:30	3		5				
01:45	0	4	0	1			5	13:45	2	13	9	27			40
02:00	0		0					14:00	1		6				
02:15	0		0					14:15	4		3				
02:30	0		1					14:30	1		2				
02:45	1	1	0	1			2	14:45	2	8	8	19			27
03:00	0		0					15:00	1		5				
03:15	0		0					15:15	3		7				
03:30	0		0					15:30	2		4				
03:45	0	0	0	0				15:45	1	7	8	24			31
04:00	0		0					16:00	4		5				
04:15	2		1					16:15	1		11				
04:30	0		0					16:30	2		7				
04:45	1	3	1	2			5	16:45	2	9	4	27			36
05:00	0		1					17:00	2		8				
05:15	1		0					17:15	3		5				
05:30	1		1					17:30	2		9				
05:45	2	4	2	4			8	17:45	5	12	6	28			40
06:00	1		1					18:00	2		3				
06:15	0		0					18:15	4		2				
06:30	1		1					18:30	1		1				
06:45	2	4	3	5			9	18:45	5	12	1	7			19
07:00	1		2					19:00	2		2				
07:15	3		1					19:15	6		0				
07:30	5		1					19:30	9		0				
07:45	7	16	2	6			22	19:45	3	20	0	2			22
08:00	4		1					20:00	2		1				
08:15	6		1					20:15	1		0				
08:30	5		2					20:30	0		0				
08:45	2	17	1	5			22	20:45	0	3	1	2			5
09:00	6		3					21:00	0		0				
09:15	3		2					21:15	1		0				
09:30	2		1					21:30	0		0				
09:45	5	16	4	10			26	21:45	0	1	1	1			2
10:00	8		1					22:00	0		2				
10:15	5		2					22:15	0		1				
10:30	4		4					22:30	0		0				
10:45	6	23	2	9			32	22:45	1	1	0	3			4
11:00	7		5					23:00	0		0				
11:15	1		3					23:15	0		1				
11:30	3		3					23:30	0		0				
11:45	2	13	5	16			29	23:45	0	0	0	1			1
Total Vol.		102		59			**161**			104		151			**255**

GPS Coordinates: 32.129082, -111.003229

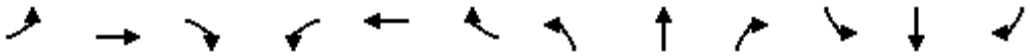
Daily Totals

NB	SB	EB	WB	Combined
206	210			**416**

	AM			PM		
Split %	63.4%	36.6%	**38.7%**	40.8%	59.2%	**61.3%**
Peak Hour	10:00	11:00	**10:15**	18:45	15:45	**13:00**
Volume	23	16	**35**	22	31	**40**
P.H.F.	0.72	0.80	**0.73**	0.61	0.70	**0.71**

HCM 6th Signalized Intersection Summary
3: Headley Road & Valencia Road

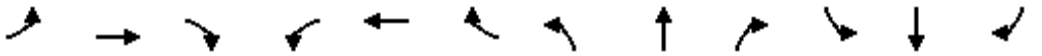
10/13/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1619	18	50	852	22	26	6	71	70	13	51
Future Volume (veh/h)	23	1619	18	50	852	22	26	6	71	70	13	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	1779	20	54	916	24	37	9	101	88	16	64
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.70	0.70	0.70	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	527	2324	26	153	1350	35	514	678	574	541	118	474
Arrive On Green	0.22	0.45	0.45	0.04	0.26	0.26	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	5205	59	1781	5116	134	1319	1870	1585	1283	327	1308
Grp Volume(v), veh/h	25	1163	636	54	609	331	37	9	101	88	0	80
Grp Sat Flow(s),veh/h/ln	1781	1702	1860	1781	1702	1846	1319	1870	1585	1283	0	1635
Q Serve(g_s), s	0.0	25.9	25.9	0.0	14.4	14.5	1.7	0.3	3.9	4.2	0.0	3.0
Cycle Q Clear(g_c), s	0.0	25.9	25.9	0.0	14.4	14.5	4.7	0.3	3.9	4.5	0.0	3.0
Prop In Lane	1.00		0.03	1.00		0.07	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	527	1520	830	153	898	487	514	678	574	541	0	592
V/C Ratio(X)	0.05	0.77	0.77	0.35	0.68	0.68	0.07	0.01	0.18	0.16	0.00	0.14
Avail Cap(c_a), veh/h	527	1759	961	228	1834	995	514	678	574	541	0	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.7	20.9	20.9	41.4	29.7	29.7	20.8	18.4	19.5	19.8	0.0	19.2
Incr Delay (d2), s/veh	0.0	1.8	3.2	1.2	0.8	1.5	0.3	0.0	0.7	0.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	10.1	11.3	1.2	5.9	6.5	0.6	0.1	1.5	1.3	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	22.7	24.2	42.6	30.5	31.2	21.1	18.4	20.2	20.5	0.0	19.7
LnGrp LOS	C	C	C	D	C	C	C	B	C	C	A	B
Approach Vol, veh/h		1824			994			147			168	
Approach Delay, s/veh		23.2			31.4			20.3			20.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		37.1	8.2	44.7		37.1	24.6	28.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	7.5	46.5		22.5	5.5	48.5				
Max Q Clear Time (g_c+I1), s		6.7	2.0	27.9		6.5	2.0	16.5				
Green Ext Time (p_c), s		0.4	0.0	12.3		0.6	0.0	7.3				

Intersection Summary	
HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C



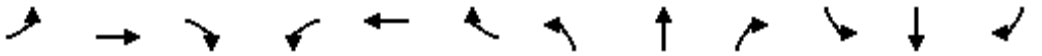
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	1566	5	109	838	73	102	42	55	169	51	55
Future Volume (veh/h)	91	1566	5	109	838	73	102	42	55	169	51	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	1780	6	118	911	79	124	51	67	209	63	68
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.82	0.82	0.82	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	309	1969	7	216	1823	158	545	207	272	520	557	472
Arrive On Green	0.11	0.75	0.75	0.06	0.38	0.38	0.07	0.28	0.28	0.08	0.30	0.30
Sat Flow, veh/h	1781	5254	18	1781	4786	414	1781	733	964	1781	1870	1585
Grp Volume(v), veh/h	103	1153	633	118	647	343	124	0	118	209	63	68
Grp Sat Flow(s),veh/h/ln	1781	1702	1867	1781	1702	1796	1781	0	1697	1781	1870	1585
Q Serve(g_s), s	3.2	23.7	23.7	3.6	13.1	13.1	4.4	0.0	4.8	7.5	2.2	2.8
Cycle Q Clear(g_c), s	3.2	23.7	23.7	3.6	13.1	13.1	4.4	0.0	4.8	7.5	2.2	2.8
Prop In Lane	1.00		0.01	1.00		0.23	1.00		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	309	1276	700	216	1297	684	545	0	479	520	557	472
V/C Ratio(X)	0.33	0.90	0.90	0.55	0.50	0.50	0.23	0.00	0.25	0.40	0.11	0.14
Avail Cap(c_a), veh/h	360	1381	757	258	1384	730	553	0	479	520	557	472
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	10.0	10.0	20.5	21.3	21.3	20.4	0.0	24.9	20.7	23.0	23.2
Incr Delay (d2), s/veh	0.4	6.0	10.2	2.2	0.3	0.6	0.2	0.0	1.2	0.5	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.5	5.7	1.5	5.1	5.5	1.8	0.0	2.1	3.1	1.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	16.0	20.2	22.6	21.6	21.9	20.7	0.0	26.1	21.2	23.4	23.8
LnGrp LOS	B	B	C	C	C	C	C	A	C	C	C	C
Approach Vol, veh/h		1889			1108			242			340	
Approach Delay, s/veh		17.4			21.8			23.3			22.1	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	29.9	9.9	38.2	10.6	31.3	9.3	38.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	20.5	7.5	36.5	6.5	21.5	7.4	36.6
Max Q Clear Time (g_c+I1), s	9.5	6.8	5.6	25.7	6.4	4.8	5.2	15.1
Green Ext Time (p_c), s	0.0	0.5	0.0	8.1	0.0	0.4	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
3: Headley Road & Valencia Road

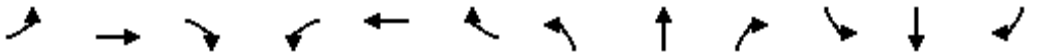
10/13/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	1272	25	86	1603	66	45	11	52	55	22	76
Future Volume (veh/h)	51	1272	25	86	1603	66	45	11	52	55	22	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	1339	26	96	1781	73	50	12	58	73	29	101
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	1869	36	394	2372	97	433	631	535	523	124	430
Arrive On Green	0.04	0.36	0.36	0.10	0.32	0.32	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1781	5156	100	1781	5031	206	1260	1870	1585	1331	366	1275
Grp Volume(v), veh/h	54	884	481	96	1204	650	50	12	58	73	0	130
Grp Sat Flow(s),veh/h/ln	1781	1702	1852	1781	1702	1833	1260	1870	1585	1331	0	1641
Q Serve(g_s), s	0.0	20.1	20.1	0.0	28.6	28.6	2.7	0.4	2.3	3.5	0.0	5.1
Cycle Q Clear(g_c), s	0.0	20.1	20.1	0.0	28.6	28.6	7.8	0.4	2.3	3.9	0.0	5.1
Prop In Lane	1.00		0.05	1.00		0.11	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	164	1234	671	394	1605	864	433	631	535	523	0	554
V/C Ratio(X)	0.33	0.72	0.72	0.24	0.75	0.75	0.12	0.02	0.11	0.14	0.00	0.23
Avail Cap(c_a), veh/h	224	1729	941	394	1797	968	433	631	535	523	0	554
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	24.7	24.7	31.9	26.0	26.1	24.3	19.9	20.5	21.2	0.0	21.5
Incr Delay (d2), s/veh	1.2	0.9	1.6	0.2	0.8	1.6	0.5	0.1	0.4	0.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.9	8.8	1.9	12.2	13.3	0.9	0.2	0.9	1.1	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	25.6	26.3	32.0	26.9	27.6	24.8	19.9	20.9	21.7	0.0	22.4
LnGrp LOS	D	C	C	C	C	C	C	B	C	C	A	C
Approach Vol, veh/h		1419			1950			120			203	
Approach Delay, s/veh		26.4			27.4			22.4			22.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		34.9	18.0	37.1		34.9	8.2	46.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.3	8.5	45.7		22.3	6.7	47.5				
Max Q Clear Time (g_c+I1), s		9.8	2.0	22.1		7.1	2.0	30.6				
Green Ext Time (p_c), s		0.3	0.1	10.5		0.8	0.0	11.8				

Intersection Summary	
HCM 6th Ctrl Delay	26.6
HCM 6th LOS	C



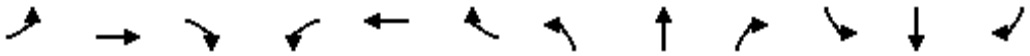
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	1268	14	127	1470	116	199	82	62	142	65	97
Future Volume (veh/h)	111	1268	14	127	1470	116	199	82	62	142	65	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	1425	16	138	1598	126	216	89	67	146	67	100
Peak Hour Factor	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	1956	22	284	1839	145	528	281	212	471	510	433
Arrive On Green	0.13	0.75	0.75	0.07	0.38	0.38	0.08	0.28	0.28	0.07	0.27	0.27
Sat Flow, veh/h	1781	5205	58	1781	4826	380	1781	990	746	1781	1870	1585
Grp Volume(v), veh/h	125	932	509	138	1127	597	216	0	156	146	67	100
Grp Sat Flow(s),veh/h/ln	1781	1702	1860	1781	1702	1802	1781	0	1736	1781	1870	1585
Q Serve(g_s), s	3.8	13.5	13.5	4.2	27.6	27.6	7.5	0.0	6.4	5.3	2.4	4.4
Cycle Q Clear(g_c), s	3.8	13.5	13.5	4.2	27.6	27.6	7.5	0.0	6.4	5.3	2.4	4.4
Prop In Lane	1.00		0.03	1.00		0.21	1.00		0.43	1.00		1.00
Lane Grp Cap(c), veh/h	212	1279	699	284	1297	687	528	0	493	471	510	433
V/C Ratio(X)	0.59	0.73	0.73	0.49	0.87	0.87	0.41	0.00	0.32	0.31	0.13	0.23
Avail Cap(c_a), veh/h	249	1279	699	359	1343	711	528	0	493	471	510	433
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	8.7	8.7	16.7	25.8	25.8	21.4	0.0	25.3	21.2	24.7	25.4
Incr Delay (d2), s/veh	2.1	1.7	3.1	1.3	6.2	11.0	0.5	0.0	1.7	0.4	0.5	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	2.9	3.5	1.7	11.7	13.3	3.3	0.0	2.8	2.2	1.1	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	10.3	11.7	18.0	32.0	36.8	21.9	0.0	27.0	21.6	25.2	26.6
LnGrp LOS	C	B	B	B	C	D	C	A	C	C	C	C
Approach Vol, veh/h		1566			1862			372			313	
Approach Delay, s/veh		11.7			32.5			24.0			24.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	30.1	10.6	38.3	12.0	29.1	10.1	38.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	22.5	9.9	33.1	7.5	21.5	7.5	35.5
Max Q Clear Time (g_c+I1), s	7.3	8.4	6.2	15.5	9.5	6.4	5.8	29.6
Green Ext Time (p_c), s	0.0	0.7	0.1	9.5	0.0	0.5	0.0	4.7

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: Headley Road & Valencia Road

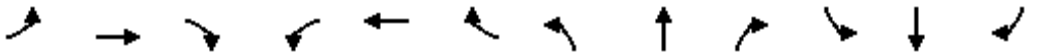
10/13/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1718	19	53	904	23	28	6	75	74	14	54
Future Volume (veh/h)	24	1718	19	53	904	23	28	6	75	74	14	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	1888	21	57	972	25	40	9	107	92	18	68
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.70	0.70	0.70	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	545	2410	27	155	1391	36	485	645	547	516	118	447
Arrive On Green	0.23	0.46	0.46	0.06	0.36	0.36	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1781	5206	58	1781	5119	132	1311	1870	1585	1276	343	1295
Grp Volume(v), veh/h	26	1234	675	57	646	351	40	9	107	92	0	86
Grp Sat Flow(s),veh/h/ln	1781	1702	1860	1781	1702	1847	1311	1870	1585	1276	0	1637
Q Serve(g_s), s	0.0	27.5	27.5	0.0	14.6	14.6	2.0	0.3	4.3	4.6	0.0	3.3
Cycle Q Clear(g_c), s	0.0	27.5	27.5	0.0	14.6	14.6	5.2	0.3	4.3	4.9	0.0	3.3
Prop In Lane	1.00		0.03	1.00		0.07	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	545	1576	861	155	925	502	485	645	547	516	0	565
V/C Ratio(X)	0.05	0.78	0.78	0.37	0.70	0.70	0.08	0.01	0.20	0.18	0.00	0.15
Avail Cap(c_a), veh/h	545	1759	961	228	1834	995	485	645	547	516	0	565
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	20.4	20.4	40.7	25.6	25.6	22.2	19.4	20.7	21.0	0.0	20.4
Incr Delay (d2), s/veh	0.0	2.2	3.9	1.3	0.9	1.6	0.3	0.0	0.8	0.8	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	10.7	12.1	1.2	5.3	5.9	0.6	0.1	1.7	1.5	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	22.5	24.3	42.0	26.5	27.2	22.5	19.4	21.5	21.8	0.0	21.0
LnGrp LOS	C	C	C	D	C	C	C	B	C	C	A	C
Approach Vol, veh/h		1935			1054			156			178	
Approach Delay, s/veh		23.1			27.5			21.7			21.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		35.5	8.3	46.2		35.5	25.5	29.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	7.5	46.5		22.5	5.5	48.5				
Max Q Clear Time (g_c+I1), s		7.2	2.0	29.5		6.9	2.0	16.6				
Green Ext Time (p_c), s		0.4	0.0	12.1		0.6	0.0	7.8				

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C



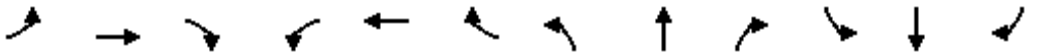
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	1662	5	116	889	77	108	45	58	179	54	58
Future Volume (veh/h)	97	1662	5	116	889	77	108	45	58	179	54	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	1889	6	126	966	84	132	55	71	221	67	72
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.82	0.82	0.82	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	308	2034	6	214	1881	163	524	198	256	493	521	442
Arrive On Green	0.11	0.77	0.77	0.06	0.39	0.39	0.07	0.27	0.27	0.08	0.28	0.28
Sat Flow, veh/h	1781	5255	17	1781	4785	415	1781	741	957	1781	1870	1585
Grp Volume(v), veh/h	110	1224	671	126	687	363	132	0	126	221	67	72
Grp Sat Flow(s),veh/h/ln	1781	1702	1867	1781	1702	1796	1781	0	1698	1781	1870	1585
Q Serve(g_s), s	3.3	26.0	26.0	3.8	13.8	13.9	4.8	0.0	5.3	7.5	2.4	3.1
Cycle Q Clear(g_c), s	3.3	26.0	26.0	3.8	13.8	13.9	4.8	0.0	5.3	7.5	2.4	3.1
Prop In Lane	1.00		0.01	1.00		0.23	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	308	1318	723	214	1338	706	524	0	455	493	521	442
V/C Ratio(X)	0.36	0.93	0.93	0.59	0.51	0.51	0.25	0.00	0.28	0.45	0.13	0.16
Avail Cap(c_a), veh/h	355	1381	757	252	1384	730	524	0	455	493	521	442
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	9.2	9.2	20.6	20.8	20.8	21.2	0.0	26.1	22.2	24.3	24.5
Incr Delay (d2), s/veh	0.5	7.8	12.6	2.6	0.3	0.6	0.3	0.0	1.5	0.6	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.7	6.1	1.6	5.3	5.7	2.0	0.0	2.3	3.4	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	16.9	21.8	23.2	21.1	21.4	21.4	0.0	27.6	22.9	24.8	25.3
LnGrp LOS	B	B	C	C	C	C	C	A	C	C	C	C
Approach Vol, veh/h		2005			1176			258			360	
Approach Delay, s/veh		18.5			21.4			24.4			23.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	28.6	10.1	39.3	11.0	29.6	9.5	39.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	20.5	7.5	36.5	6.5	21.5	7.4	36.6
Max Q Clear Time (g_c+I1), s	9.5	7.3	5.8	28.0	6.8	5.1	5.3	15.9
Green Ext Time (p_c), s	0.0	0.5	0.0	6.8	0.0	0.5	0.0	7.3

Intersection Summary		
HCM 6th Ctrl Delay		20.3
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
3: Headley Road & Valencia Road

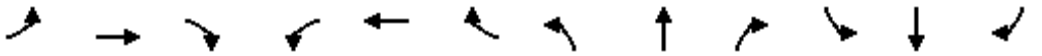
10/13/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	1350	27	91	1701	70	48	12	55	58	23	81
Future Volume (veh/h)	54	1350	27	91	1701	70	48	12	55	58	23	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	1421	28	101	1890	78	53	13	61	77	31	108
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	1960	39	390	2449	101	403	600	509	499	117	409
Arrive On Green	0.04	0.38	0.38	0.10	0.33	0.33	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1781	5155	102	1781	5030	207	1250	1870	1585	1326	366	1275
Grp Volume(v), veh/h	57	938	511	101	1278	690	53	13	61	77	0	139
Grp Sat Flow(s),veh/h/ln	1781	1702	1852	1781	1702	1833	1250	1870	1585	1326	0	1641
Q Serve(g_s), s	0.0	21.2	21.2	0.0	30.4	30.5	3.0	0.4	2.4	3.8	0.0	5.7
Cycle Q Clear(g_c), s	0.0	21.2	21.2	0.0	30.4	30.5	8.6	0.4	2.4	4.2	0.0	5.7
Prop In Lane	1.00		0.05	1.00		0.11	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	164	1294	704	390	1657	893	403	600	509	499	0	527
V/C Ratio(X)	0.35	0.73	0.73	0.26	0.77	0.77	0.13	0.02	0.12	0.15	0.00	0.26
Avail Cap(c_a), veh/h	222	1729	940	390	1797	967	403	600	509	499	0	527
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.44	0.44	0.44	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	23.9	23.9	32.0	25.8	25.8	25.9	20.9	21.6	22.3	0.0	22.7
Incr Delay (d2), s/veh	1.3	1.0	1.9	0.2	0.9	1.6	0.7	0.1	0.5	0.7	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.3	9.2	2.0	12.9	14.2	0.9	0.2	1.0	1.3	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	24.9	25.7	32.2	26.7	27.5	26.5	21.0	22.1	23.0	0.0	23.9
LnGrp LOS	D	C	C	C	C	C	C	C	C	C	A	C
Approach Vol, veh/h		1506			2069			127			216	
Approach Delay, s/veh		25.8			27.2			23.8			23.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.4	17.9	38.7		33.4	8.3	48.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.3	8.5	45.7		22.3	6.7	47.5				
Max Q Clear Time (g_c+I1), s		10.6	2.0	23.2		7.7	2.0	32.5				
Green Ext Time (p_c), s		0.3	0.1	11.0		0.9	0.0	11.3				

Intersection Summary												
HCM 6th Ctrl Delay			26.4									
HCM 6th LOS			C									



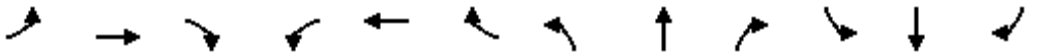
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	1346	15	135	1560	123	211	87	66	151	69	103
Future Volume (veh/h)	118	1346	15	135	1560	123	211	87	66	151	69	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	133	1512	17	147	1696	134	229	95	72	156	71	106
Peak Hour Factor	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	1994	22	281	1875	148	511	270	205	448	491	416
Arrive On Green	0.13	0.77	0.77	0.07	0.39	0.39	0.08	0.27	0.27	0.07	0.26	0.26
Sat Flow, veh/h	1781	5205	59	1781	4825	381	1781	987	748	1781	1870	1585
Grp Volume(v), veh/h	133	989	540	147	1196	634	229	0	167	156	71	106
Grp Sat Flow(s),veh/h/ln	1781	1702	1860	1781	1702	1802	1781	0	1736	1781	1870	1585
Q Serve(g_s), s	4.1	14.6	14.6	4.4	29.8	29.9	7.5	0.0	7.0	5.7	2.6	4.8
Cycle Q Clear(g_c), s	4.1	14.6	14.6	4.4	29.8	29.9	7.5	0.0	7.0	5.7	2.6	4.8
Prop In Lane	1.00		0.03	1.00		0.21	1.00		0.43	1.00		1.00
Lane Grp Cap(c), veh/h	211	1304	713	281	1323	700	511	0	475	448	491	416
V/C Ratio(X)	0.63	0.76	0.76	0.52	0.90	0.91	0.45	0.00	0.35	0.35	0.14	0.25
Avail Cap(c_a), veh/h	243	1304	713	351	1343	711	511	0	475	448	491	416
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	8.2	8.2	16.7	25.9	26.0	22.4	0.0	26.3	22.0	25.4	26.2
Incr Delay (d2), s/veh	3.3	2.1	3.8	1.5	8.8	15.2	0.6	0.0	2.0	0.5	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	3.0	3.6	1.8	13.1	15.1	3.6	0.0	3.1	2.4	1.2	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	10.3	11.9	18.2	34.7	41.1	23.1	0.0	28.3	22.5	26.0	27.7
LnGrp LOS	C	B	B	B	C	D	C	A	C	C	C	C
Approach Vol, veh/h		1662			1977			396			333	
Approach Delay, s/veh		11.8			35.6			25.3			24.9	
Approach LOS		B			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	29.1	10.9	39.0	12.0	28.1	10.4	39.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	22.5	9.9	33.1	7.5	21.5	7.5	35.5
Max Q Clear Time (g_c+I1), s	7.7	9.0	6.4	16.6	9.5	6.8	6.1	31.9
Green Ext Time (p_c), s	0.0	0.7	0.1	9.7	0.0	0.6	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: Headley Road & Valencia Road

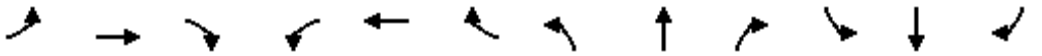
07/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1722	19	53	916	24	28	6	75	75	14	54
Future Volume (veh/h)	24	1722	19	53	916	24	28	6	75	75	14	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	1892	21	57	985	26	40	9	107	94	18	68
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.70	0.70	0.70	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	540	2413	27	155	1407	37	484	644	546	515	118	446
Arrive On Green	0.23	0.46	0.46	0.06	0.37	0.37	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1781	5206	58	1781	5115	135	1311	1870	1585	1276	343	1295
Grp Volume(v), veh/h	26	1237	676	57	655	356	40	9	107	94	0	86
Grp Sat Flow(s),veh/h/ln	1781	1702	1860	1781	1702	1846	1311	1870	1585	1276	0	1637
Q Serve(g_s), s	0.0	27.6	27.6	0.0	14.8	14.8	2.0	0.3	4.3	4.7	0.0	3.3
Cycle Q Clear(g_c), s	0.0	27.6	27.6	0.0	14.8	14.8	5.2	0.3	4.3	5.0	0.0	3.3
Prop In Lane	1.00		0.03	1.00		0.07	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	540	1578	862	155	937	508	484	644	546	515	0	564
V/C Ratio(X)	0.05	0.78	0.78	0.37	0.70	0.70	0.08	0.01	0.20	0.18	0.00	0.15
Avail Cap(c_a), veh/h	540	1759	961	228	1834	995	484	644	546	515	0	564
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.9	20.3	20.4	40.7	25.4	25.4	22.2	19.4	20.7	21.1	0.0	20.4
Incr Delay (d2), s/veh	0.0	2.2	3.9	1.3	0.9	1.6	0.3	0.0	0.8	0.8	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	10.7	12.1	1.2	5.4	6.0	0.6	0.1	1.7	1.5	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	22.5	24.3	42.0	26.2	27.0	22.6	19.5	21.5	21.9	0.0	21.0
LnGrp LOS	C	C	C	D	C	C	C	B	C	C	A	C
Approach Vol, veh/h		1939			1068			156			180	
Approach Delay, s/veh		23.1			27.3			21.7			21.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		35.5	8.3	46.2		35.5	25.2	29.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	7.5	46.5		22.5	5.5	48.5				
Max Q Clear Time (g_c+I1), s		7.2	2.0	29.6		7.0	2.0	16.8				
Green Ext Time (p_c), s		0.4	0.0	12.1		0.6	0.0	8.0				

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	1670	10	124	889	77	121	47	82	179	55	58
Future Volume (veh/h)	97	1670	10	124	889	77	121	47	82	179	55	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	1898	11	135	966	84	148	57	100	221	68	72
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.82	0.82	0.82	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	2036	12	219	1905	165	517	160	281	458	512	434
Arrive On Green	0.11	0.78	0.78	0.07	0.40	0.40	0.07	0.26	0.26	0.08	0.27	0.27
Sat Flow, veh/h	1781	5239	30	1781	4785	415	1781	609	1069	1781	1870	1585
Grp Volume(v), veh/h	110	1233	676	135	687	363	148	0	157	221	68	72
Grp Sat Flow(s),veh/h/ln	1781	1702	1865	1781	1702	1796	1781	0	1678	1781	1870	1585
Q Serve(g_s), s	3.3	26.4	26.4	4.0	13.7	13.7	5.4	0.0	6.8	7.5	2.5	3.1
Cycle Q Clear(g_c), s	3.3	26.4	26.4	4.0	13.7	13.7	5.4	0.0	6.8	7.5	2.5	3.1
Prop In Lane	1.00		0.02	1.00		0.23	1.00		0.64	1.00		1.00
Lane Grp Cap(c), veh/h	311	1323	725	219	1355	715	517	0	441	458	512	434
V/C Ratio(X)	0.35	0.93	0.93	0.62	0.51	0.51	0.29	0.00	0.36	0.48	0.13	0.17
Avail Cap(c_a), veh/h	358	1381	756	251	1384	730	517	0	441	458	512	434
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	9.1	9.1	20.6	20.4	20.4	21.7	0.0	27.0	22.8	24.6	24.8
Incr Delay (d2), s/veh	0.5	8.1	13.2	3.6	0.3	0.6	0.3	0.0	2.2	0.8	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.7	6.2	1.8	5.3	5.7	2.3	0.0	3.0	3.5	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	17.2	22.2	24.2	20.7	21.0	22.0	0.0	29.2	23.6	25.2	25.7
LnGrp LOS	B	B	C	C	C	C	C	A	C	C	C	C
Approach Vol, veh/h		2019			1185			305			361	
Approach Delay, s/veh		18.8			21.2			25.7			24.3	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	28.2	10.4	39.5	11.0	29.2	9.5	40.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	20.5	7.5	36.5	6.5	21.5	7.4	36.6
Max Q Clear Time (g_c+I1), s	9.5	8.8	6.0	28.4	7.4	5.1	5.3	15.7
Green Ext Time (p_c), s	0.0	0.6	0.0	6.6	0.0	0.5	0.0	7.3

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	0	0	24	17	14
Future Vol, veh/h	39	0	0	24	17	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	0	0	26	18	15

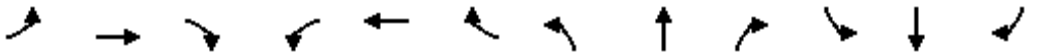
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	26	33	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	26	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	957	1050	1579	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	997	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	957	1050	1579	-	-	-
Mov Cap-2 Maneuver	957	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	997	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1579	-	957	-	-
HCM Lane V/C Ratio	-	-	0.044	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th Signalized Intersection Summary
3: Headley Road & Valencia Road

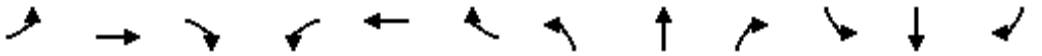
07/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	1363	27	91	1709	71	48	12	55	60	23	81
Future Volume (veh/h)	54	1363	27	91	1709	71	48	12	55	60	23	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	1435	28	101	1899	79	53	13	61	80	31	108
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	1975	39	387	2454	102	401	598	507	497	117	408
Arrive On Green	0.04	0.38	0.38	0.10	0.33	0.33	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1781	5156	101	1781	5028	209	1250	1870	1585	1326	366	1275
Grp Volume(v), veh/h	57	947	516	101	1285	693	53	13	61	80	0	139
Grp Sat Flow(s),veh/h/ln	1781	1702	1852	1781	1702	1833	1250	1870	1585	1326	0	1641
Q Serve(g_s), s	0.0	21.4	21.4	0.0	30.6	30.7	3.0	0.4	2.5	4.0	0.0	5.7
Cycle Q Clear(g_c), s	0.0	21.4	21.4	0.0	30.6	30.7	8.6	0.4	2.5	4.4	0.0	5.7
Prop In Lane	1.00		0.05	1.00		0.11	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	164	1304	710	387	1662	895	401	598	507	497	0	524
V/C Ratio(X)	0.35	0.73	0.73	0.26	0.77	0.78	0.13	0.02	0.12	0.16	0.00	0.27
Avail Cap(c_a), veh/h	222	1729	941	387	1797	967	401	598	507	497	0	524
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.44	0.44	0.44	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	23.7	23.7	32.1	25.8	25.8	26.0	21.0	21.7	22.5	0.0	22.8
Incr Delay (d2), s/veh	1.3	1.1	1.9	0.2	0.9	1.7	0.7	0.1	0.5	0.7	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.4	9.3	2.0	13.0	14.2	0.9	0.2	1.0	1.3	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	24.8	25.7	32.3	26.7	27.5	26.6	21.0	22.1	23.2	0.0	24.0
LnGrp LOS	D	C	C	C	C	C	C	C	C	C	A	C
Approach Vol, veh/h		1520			2079			127			219	
Approach Delay, s/veh		25.7			27.2			23.9			23.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.3	17.8	39.0		33.3	8.3	48.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.3	8.5	45.7		22.3	6.7	47.5				
Max Q Clear Time (g_c+I1), s		10.6	2.0	23.4		7.7	2.0	32.7				
Green Ext Time (p_c), s		0.3	0.1	11.1		0.9	0.0	11.2				

Intersection Summary												
HCM 6th Ctrl Delay			26.4									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	1351	30	162	1560	123	220	88	82	151	71	103
Future Volume (veh/h)	118	1351	30	162	1560	123	220	88	82	151	71	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	133	1518	34	176	1696	134	239	96	89	156	73	106
Peak Hour Factor	0.89	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	1914	43	289	1875	148	508	244	226	431	490	415
Arrive On Green	0.13	0.74	0.74	0.08	0.39	0.39	0.08	0.27	0.27	0.07	0.26	0.26
Sat Flow, veh/h	1781	5139	115	1781	4825	381	1781	893	828	1781	1870	1585
Grp Volume(v), veh/h	133	1006	546	176	1196	634	239	0	185	156	73	106
Grp Sat Flow(s),veh/h/ln	1781	1702	1850	1781	1702	1802	1781	0	1721	1781	1870	1585
Q Serve(g_s), s	4.1	16.6	16.6	5.4	29.8	29.9	7.5	0.0	7.9	5.8	2.7	4.8
Cycle Q Clear(g_c), s	4.1	16.6	16.6	5.4	29.8	29.9	7.5	0.0	7.9	5.8	2.7	4.8
Prop In Lane	1.00		0.06	1.00		0.21	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	212	1268	689	289	1323	700	508	0	470	431	490	415
V/C Ratio(X)	0.63	0.79	0.79	0.61	0.90	0.91	0.47	0.00	0.39	0.36	0.15	0.26
Avail Cap(c_a), veh/h	243	1268	689	339	1343	711	508	0	470	431	490	415
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	9.3	9.3	18.1	25.9	26.0	22.8	0.0	26.6	22.2	25.5	26.3
Incr Delay (d2), s/veh	3.2	2.8	5.1	2.4	8.8	15.2	0.7	0.0	2.5	0.5	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.5	4.2	2.3	13.1	15.1	4.0	0.0	3.5	2.4	1.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.0	12.1	14.4	20.4	34.7	41.1	23.5	0.0	29.1	22.7	26.1	27.7
LnGrp LOS	C	B	B	C	C	D	C	A	C	C	C	C
Approach Vol, veh/h		1685			2006			424			335	
Approach Delay, s/veh		13.7			35.5			25.9			25.0	
Approach LOS		B			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	29.1	11.9	38.0	12.0	28.1	10.4	39.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	22.5	9.9	33.1	7.5	21.5	7.5	35.5
Max Q Clear Time (g_c+I1), s	7.8	9.9	7.4	18.6	9.5	6.8	6.1	31.9
Green Ext Time (p_c), s	0.0	0.8	0.1	9.0	0.0	0.6	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	0	0	23	33	44
Future Vol, veh/h	26	0	0	23	33	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	0	0	25	36	48

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	85	60	84	0	-	0
Stage 1	60	-	-	-	-	-
Stage 2	25	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	916	1005	1513	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	916	1005	1513	-	-	-
Mov Cap-2 Maneuver	916	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	998	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1513	-	916	-	-
HCM Lane V/C Ratio	-	-	0.031	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1909	135	1050	148	157	221	68	72
v/c Ratio	0.37	0.92	0.61	0.48	0.34	0.35	0.56	0.15	0.15
Control Delay	19.6	34.1	25.7	19.4	23.4	15.7	28.3	28.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	34.1	25.7	19.4	23.4	15.7	28.3	28.2	1.7
Queue Length 50th (ft)	36	252	36	156	58	30	90	31	0
Queue Length 95th (ft)	m55	#313	#88	197	93	70	132	58	1
Internal Link Dist (ft)		1294		1730		1708		349	
Turn Bay Length (ft)	200		200		110		100		100
Base Capacity (vph)	301	2072	227	2187	430	453	394	445	474
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.92	0.59	0.48	0.34	0.35	0.56	0.15	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	1913	57	1011	40	9	107	94	86
v/c Ratio	0.06	0.74	0.28	0.41	0.10	0.02	0.20	0.23	0.16
Control Delay	7.8	19.6	12.5	23.6	26.8	25.5	6.7	28.2	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	19.6	12.5	23.6	26.8	25.5	6.7	28.2	10.4
Queue Length 50th (ft)	7	292	9	70	17	4	0	42	8
Queue Length 95th (ft)	13	350	m19	267	34	12	19	75	35
Internal Link Dist (ft)		1114		1294		1698			404
Turn Bay Length (ft)	210		240		100		100	100	
Base Capacity (vph)	412	2623	225	2912	385	549	542	413	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.73	0.25	0.35	0.10	0.02	0.20	0.23	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	57	1463	101	1978	53	13	61	80	139
v/c Ratio	0.29	0.62	0.32	0.75	0.16	0.02	0.12	0.20	0.25
Control Delay	16.1	19.4	22.5	34.6	27.9	25.7	6.0	28.2	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	19.4	22.5	34.6	27.9	25.7	6.0	28.2	9.9
Queue Length 50th (ft)	11	232	31	384	23	6	0	36	13
Queue Length 95th (ft)	23	243	m37	m432	55	20	24	61	40
Internal Link Dist (ft)		1114		1294		1698			404
Turn Bay Length (ft)	210		240		100		100	100	
Base Capacity (vph)	214	2576	327	2672	341	532	504	398	546
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.57	0.31	0.74	0.16	0.02	0.12	0.20	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	133	1552	176	1830	239	185	156	73	106
v/c Ratio	0.59	0.81	0.67	0.91	0.52	0.39	0.41	0.16	0.22
Control Delay	37.1	25.0	28.1	34.0	26.1	23.3	23.9	28.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	25.0	28.1	34.0	26.1	23.3	23.9	28.4	4.9
Queue Length 50th (ft)	52	162	50	351	97	63	60	33	0
Queue Length 95th (ft)	105	222	#117	#458	159	124	105	69	29
Internal Link Dist (ft)		1294		1730		1708		349	
Turn Bay Length (ft)	200		200		110		100		100
Base Capacity (vph)	230	1907	277	2004	463	469	383	445	474
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.81	0.64	0.91	0.52	0.39	0.41	0.16	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Appendix D

Class III Cultural Resources Survey

by

Tierra Right-of-Way Land Services Company
July, 2022

STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM

1. REPORT TITLE

1a. Report Title*:* *Cultural Resources Class III Survey of 15.3 Acres at 6765 South Headley Road, in Tucson, Pima County, Arizona.*

1b. Report Author(s): Galen McCloskey, M.A., and Alison Talbot, B.A.

1c. Date: July 27, 2022 **1d. Report No.:** Tierra Archaeological Report No. 2022-091

2. PROJECT REGISTRATION/PERMITS

2a. ASM Accession Number: N/A

2b. AAA Permit Number: N/A

2c. ASLD Lease Application Number(s): N/A

2d. Other Permit Number(s).: N/A

3. ORGANIZATION/CONSULTING FIRM

3a. Name: Tierra Right of Way Services, Ltd.

3b. Internal Project Number: 22TA00-150.01

3c. Internal Project Name: ACM-6765 S Headley Class III

3d. Contact Name: Barb Montgomery

3e. Contact Address: 1575 East River Road, Suite 201, Tucson, AZ 85718

3f. Contact Phone: 520.319.2106

3g. Contact Email: bmontgomery@tierra-row.com

4. SPONSOR/LEAD AGENCY

4a. Sponsor: ACM Ventures

4b. Lead Agency: Pima County

4c. Agency Project Number(s): N/A

4d. Agency Project Name: N/A

4e. Funding Source(s): Private

4f. Other Involved Agencies: N/A

4g. Applicable Regulations: Pima County Ordinance No. 2018-027

5. DESCRIPTION OF PROJECT OR UNDERTAKING: ACM Ventures has proposed the development of two parcels of private land in Pima County, which will require rezoning.

6. PROJECT AREA/AREA OF POTENTIAL EFFECTS: The project includes approximately 15.3 acres (6.19 hectares) between S. Indian Agency and S. Headley Roads south of W. Valencia Road, behind a Fry's grocery store (Photo 1; Figure 1 and 2). The project area includes two Pima County parcels (138-24-0310 and 138-24-0320).

7. PROJECT LOCATION

7a. Address: 6765 S. Headley Rd., Tucson, AZ, 85746

7b. Route: N/A **7c. Mileposts Limits:** N/A

7d. Nearest City/Town: Tucson **7e. County:** Pima County

7f. Project Locator UTM: 499483 Easting, 3554783 Northing **7g. NAD** 83 **7h. Zone:** 12

7i. Baseline & Meridian: G&SR **7j. USGS Quadrangle(s):** Cat Mountain, AZ 7.5-minute

7k. Legal Description(s): Portions of the N ½ of the SW ¼ of the NW ¼ of Section 15, Township 15 South, Range 13 East.

8. SURVEY AREA

8a. Total Acres: 15.29 acres

8b. Survey Area.

1. Land Jurisdiction	2. Total Acres Surveyed	3. Total Acres Not Surveyed	4. Justification for Areas Not Surveyed
Private	15.29	0	N/A

9. ENVIRONMENTAL CONTEXTS

9a. Landform: Flood plains

9b. Elevation: 2,480 ft amsl.

9c. Surrounding Topographic Features: Flood plains

9d. Nearest Drainage: Santa Cruz River

9e. Local Geology: Holocene River Alluvium (0-10kya) (Arizona Geological Survey 2022).

9f. Vegetation: Arizona Upland Subdivision of the Sonoran Desertscrub biotic community (Brown 1994). Vegetation includes mesquite tree and various grasses, although much of the area has been cleared of vegetation.

9g. Soils/Deposition: Grabe silty clay loam (NRCS 2022).

9h. Buried Deposits: Possible buried deposits

9i. Justification: The project area is located near the west bank of the Santa Cruz River and 20 previously recorded sites are within 1 mile of the project area. However, only three isolated occurrences were encountered during the survey and there are no indications of subsurface cultural deposits.

I0. BUILT ENVIRONMENT: Undeveloped and residential neighborhood around the project area, and shopping complexes to the north and northeast.

11. INVENTORY CLASS COMPLETED

11a. Class I Inventory: ☐

11b. Researcher(s):

11c. Class II Survey: ☐

11d Sampling Strategy:

11e. Class III Inventory: ☒

12. BACKGROUND RESEARCH SOURCES

12a. AZSITE: ☒

12b. ASM Archaeological Records Office: ☐

12c. SHPO Inventories and/or SHPO Library: ☐

12d. NRHP Database: ☒

12e. ADOT Portal: ☐

12f. GLO Maps: GLO Map No. 2117 (T15S, R13E), dated June 23, 1871, shows agricultural fields and homesteads in the surrounding areas, but no other significant historic features or roads that intersect the project area (Figure 3).

12g. Land- Managing Agency Files: N/A

12h. Tribal Cultural Resources Files: N/A

12i. Local Government Websites: N/A

12j. Other: N/A

13. BACKGROUND RESEARCH RESULTS

13a. Previous Projects within Project Area (Figure 4 REDACTED)

1. Project Reference Number	2. Project Name	3. Author(s)	4. Year
1995-4.ASM	Indian Agency Road Testing	Dart	1995

13b. Previously Recorded Cultural Resources within 1 Mile (1.6 Km) of Project Area

1. Site Number	2. Affiliation	3. Site Type	4. Eligibility Status	5. Associated Reference(s)
AZ BB:13:15(ASM)	Hohokam	Village	Eligible (SHPO)	Neily 2016
AZ BB:13:19(ASM)	Hohokam, O'odham	Foundation and artifact scatter	Eligible (recorder)	Dolan and Deaver 2007
AZ BB:13:56(ASM)	Archaic, Hohokam, Mexican-American	Adobe structure, pit houses, and artifact scatter	Eligible (SHPO)	Dolan and Deaver 2007
AZ BB:13:100(ASM)	Native Archaeological Culture	Artifact scatter	Unevaluated	O'Mack 2013
AZ BB:13:106(ASM)	Hohokam, Euro-American	Artifact and trash scatters	Eligible (SHPO)	Dolan and Deaver 2007
AZ BB:13:136(ASM)	Hohokam, Tohono O'odham	Artifact and trash scatters	Not eligible (SHPO)	Unknown
AZ BB:13:834(ASM)	Hohokam	Artifact scatter	Unevaluated	O'Mack 2013
AZ BB:13:835(ASM)	Euro-American	Historic structure	Eligible (recorder)	O'Mack 2013
AZ AA:16:44(ASM)	Hohokam	Pit features and artifact scatter	Eligible (recorder)	Hesse 2003
AZ AA:16:58(ASM)	Hohokam	Artifact scatter	Unknown	Jones 2014
AZ AA:16:61(ASM)	Hohokam, Tohono O'odham	Foundation and undefined depression	Eligible (recorder)	O'Mack 2014
AZ AA:16:62(ASM)	Hohokam, Tohono O'odham	Foundation and artifact scatter	Eligible (recorder)	O'Mack 2014
AZ AA:16:67(ASM)	Native Archaeological Culture	Artifact scatter	Eligible (SHPO)	Unknown
AZ AA:16:68(ASM)	Mexican-American	Foundation and trash mound	Eligible (SHPO)	Unknown
AZ AA:16:86(ASM)	Hohokam	Artifact scatter	Unevaluated	Barr 2015
AZ AA:16:91(ASM)	Tohono O'odham	Artifact scatter	Unknown	O'Mack 2014
AZ AA:16:396(ASM)	O'odham	Burial	Not eligible (recorder)	Jones 1996
AZ AA:16:432(ASM)	Hohokam	Artifact scatter	Eligible (recorder)	Dolan and Deaver 2007
AZ AA:16:474(ASM)	Hohokam	Artifact scatter	Unevaluated	Hopkins 2005
AZ AA:16:605(ASM)	Hohokam	Artifact scatter	Unevaluated	Barr 2015

13c. Historic Buildings/Districts/Neighborhoods. (None in project area)

1. Property Name or Address	2. Year	3. Eligibility Status
N/A		

14. CULTURAL CONTEXTS

14a. Prehistoric Culture: Hohokam

14b. Protohistoric Culture: O'odham

14c. Indigenous Historic Culture: O'odham

14d. Euro-American Culture: A.D. 1500-1969

15. FIELD SURVEY PERSONNEL

15a. Principal Investigator: Barbara Montgomery, Ph.D.

15b. Field Supervisor: Alison Talbot, B.A.

15c. Crew: N/A

15d. Fieldwork Date(s): July 6, 2022

16. SURVEY METHODS

16a. Transect Intervals: 20 m apart

16b. Coverage (%): 100

16c. Site Recording Criteria: ASM

16d. Ground Surface Visibility: 0%

16e. Observed Disturbances: Residential homes in the east end of the project area; the entire area has been cleared of vegetation.

17. FIELD SURVEY RESULTS

17a. No Cultural Resources Identified: ☐

17b. Isolated Occurrences (IOs) Only: ☒

17c. Number of IOs Recorded: 3

17d. Table of IOs (Figure 5).

1. IO Number	2. Description	3. Date Range	4. UTMs
1	Plain ware sherd	AD 200-1400	E499584, N3554780
2	Plain ware sherd	AD 200-1400	E499554, N3554713
3	Black chert tertiary flake	AD 200-1400	E499554, N3554737

18. COMMENTS: No sites or historic buildings were observed in the project area during the survey. Tierra encountered three isolated occurrences during the survey, but the area has been heavily disturbed both inside and outside the project area and these artifacts may have originated from elsewhere. The nearest previously recorded site is AZ AA:16:86(ASM), which is about 200 meters to the north, but does not extend into the project area. Tierra recommends that ACM Ventures be allowed to proceed with the proposed project without further archaeological work.

SECTION 19. ATTACHMENTS
19a. Project Location Map: ☒ Figures 1 and 2
19b. Land Jurisdiction Map: ☒ Figure 1
19c. Background Research Map(s): ☒ Figure 4 REDACTED
19d. GLO Map(s): ☒ Figure 3
19e. References: ☒

SECTION 20. CONSULTANT CERTIFICATION

I certify the information provided herein has been reviewed for content and accuracy and all work meets applicable agency standards.

Barbara K. Montgomery

Signature

Principal Investigator

Title

SECTION 21. DISCOVERY CLAUSE

In the event that previously unreported cultural resources are encountered during ground disturbing activities, all work must immediately cease within 30 meters (100 feet) until a qualified archaeologist has documented the discovery and evaluated its eligibility for the Arizona or National Register of Historic Places in consultation with the lead agency, the SHPO, and Tribes, as appropriate. Work must not resume in this area without approval of the lead agency.

If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 meters (100 feet) of the discovery and the area must be secured. The Arizona State Museum, lead agency, SHPO, and appropriate Tribes must be notified of the discovery. All discoveries will be treated in accordance with NAGPRA (Public Law 101-601; 25 U.S.C. 3001-3013) or Arizona Revised Statutes (A.R.S. § 41-844 and A.R.S. § 41-865), as appropriate, and work must not resume in this area without authorization from ASM and the lead agency.

References Cited

Arizona Geological Survey
2022 The Geologic Map of Arizona. Available at: http://data.azgs.az.gov/geologic-map-of-arizona/. Accessed on July 12, 2022.

Barr, David M. R.
2015 *Archaeological Survey of 13.46 Acres for the Proposed Fry's 83 Shopping Center in Tucson, Pima County, Arizona.* Cultural Resource Report No. 15-233. SWCA Environmental Consultants, Inc., Tucson.

Brown, David E. (editor)
1994 *Biotic Communities: Southwestern United States and Northwestern Mexico.* University of Utah Press, Salt Lake City.

Dart, Allen
1995 *Results of Archaeological Subsurface Testing at Three Areas of the Indian Agency Road Property in Section 15, T15S, R13E, G&SRB&M, in Tucson, Arizona.* Letter Report 95-1. Old Pueblo Archaeology Center, Tucson.

Dolan, Sara M., and William L. Deaver
2007 *Archaeological Resources of the San Xavier Sand and Gravel Property: A Class III Inventory.* Cultural Resources Report 2007-17. WestLand Resources, Inc., Tucson.

Hesse, S. Jerome
2003 *A Cultural Resource Survey of Five Construction Sites along the EPNG Lines 1008 and 1015 in Pima County, Arizona.* Cultural Resource Report No. 03-187. SWCA Environmental Consultants, Inc., Tucson.

Hopkins, Maren
2005 *A Cultural Resources Survey of 8.76 Acres in Midvale Park near the Intersection of Valencia Road and Sandpiper Avenue, Pima County, Arizona.* Technical Report No. 05-51. Northland Research, Inc., Tempe.

Jones, Jeffrey T.
1996 *Removal of a Possibly Protohistoric O'odham Human Burial from a Gravel Pit along Indian Agency Road in Tucson, Arizona.* Letter Report No. 95-12. Old Pueblo Archaeology Center, Tucson.

2014 *A Class III Cultural Resource Survey of Proposed Natural Gas Line Right-of-Way near Los Reales and Cardinal Avenue for Southwest Gas in Pima County, Arizona.* Archaeological Report No. 2014-084. Tierra Right of Way Services, Ltd., Tucson.

Natural Resources Conservation Service (NRCS)
2022 Web Soil Survey Map. Available at: http://websoilsurvey.nrcs.usda.gov/app/. Accessed on July 12, 2022.

Neily, Robert B. (editor)
2016 *Data Recovery Investigation at the Valencia Site, AZ BB:13:15(ASM) and AZ BB:13:74(ASM), Southbound Valencia Off-Ramp, Mileposts 58.93 to 59.71, Pima County, Arizona*. Technical Report No. 125240c. Logan Simpson Design, Tempe.

O'Mack, Scott
2013 *A Cultural Resources Survey for Linear Park Improvements along the Santa Cruz River between Drexel and Valencia Roads in Tucson, Pima County, Arizona.* William Self Associates, Tucson.

2014 *A Cultural Resources Survey for a Proposed Channel Maintenance Project along the West Branch of Santa Cruz in Tucson, Arizona.* William Self Associates, Tucson.

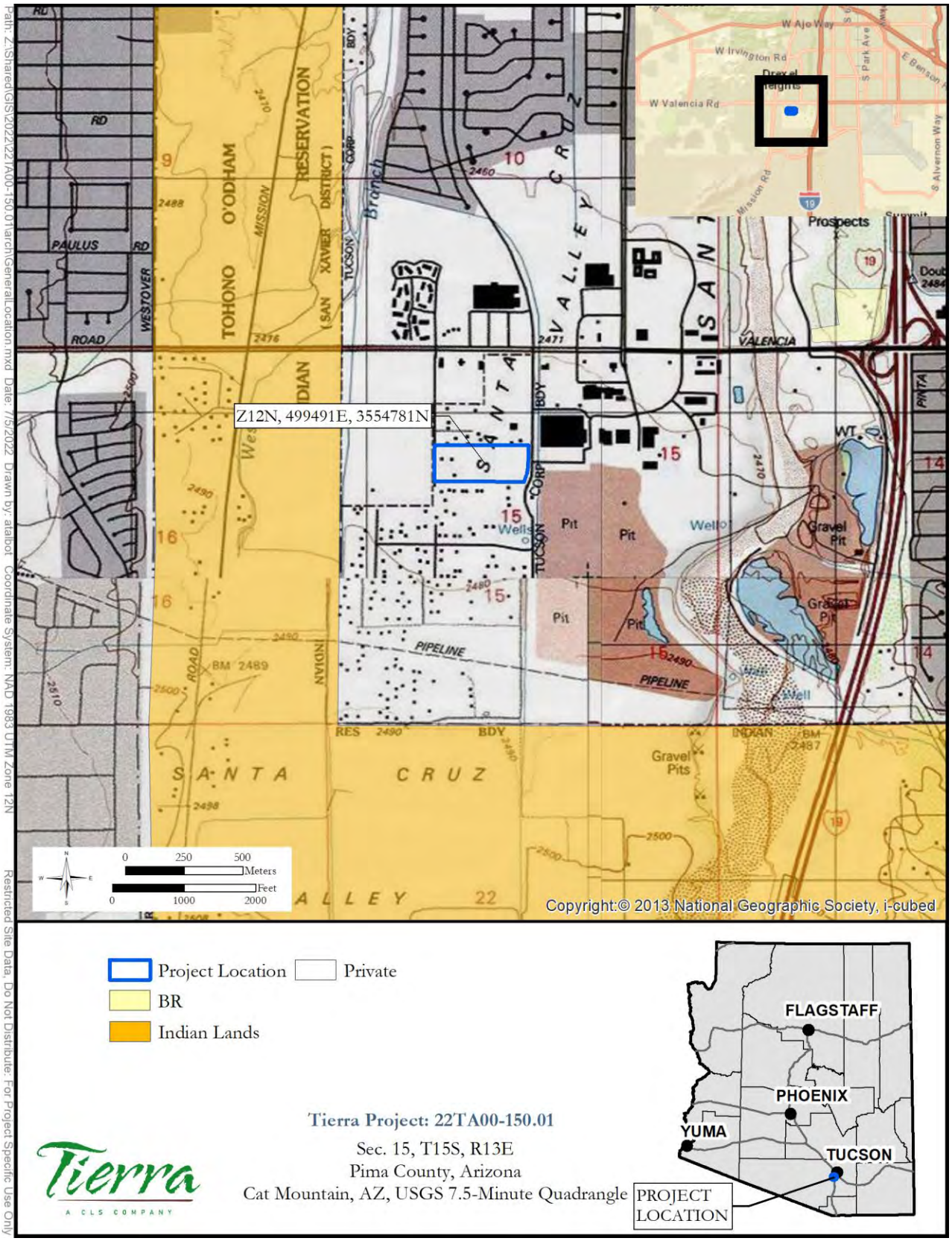


Figure 1. Project location.

Figure 2. Detail of project location.

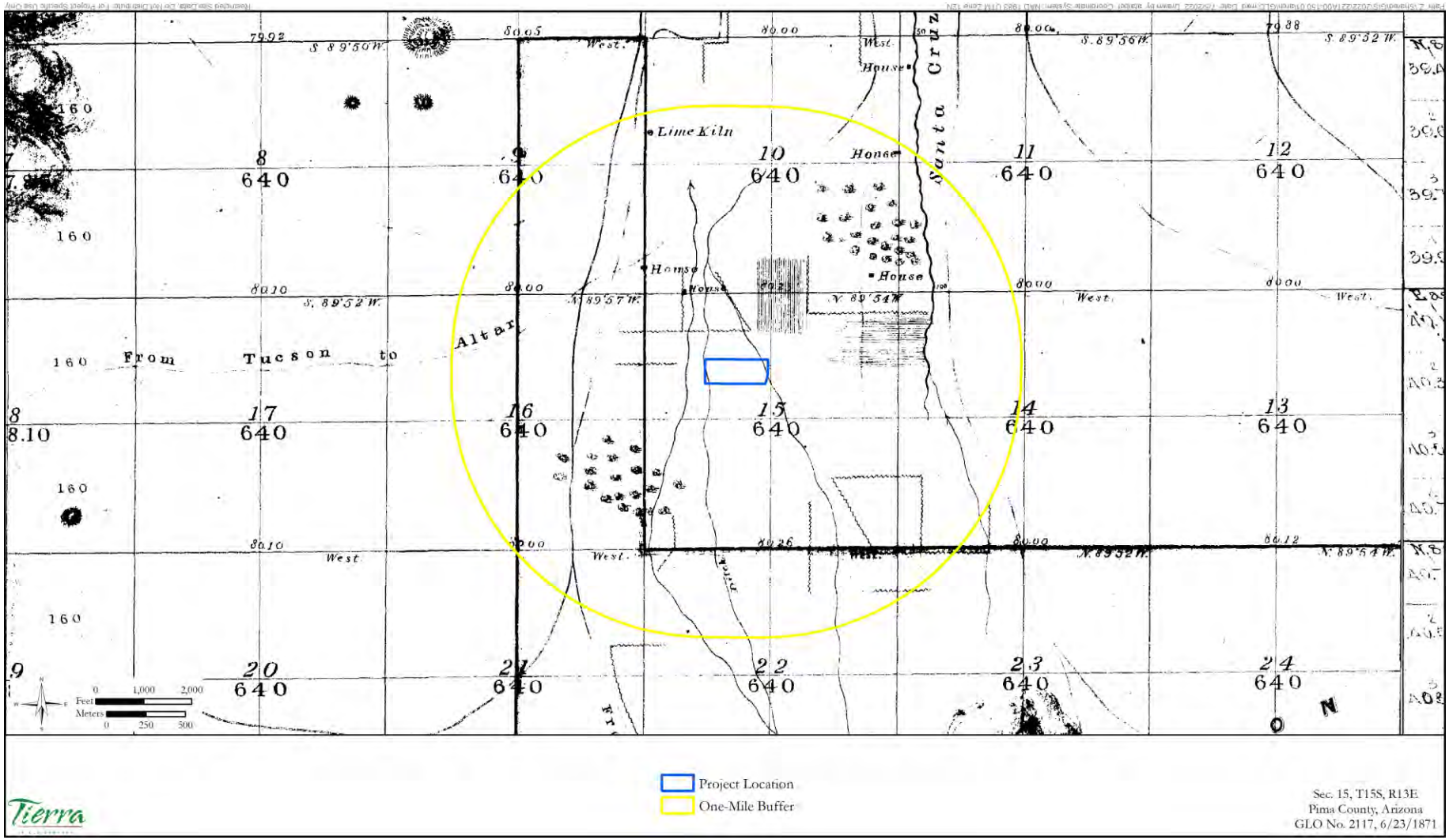


Figure 3. Portions of General Land Office Map #2117 of Township 15 South, Range 13 East.

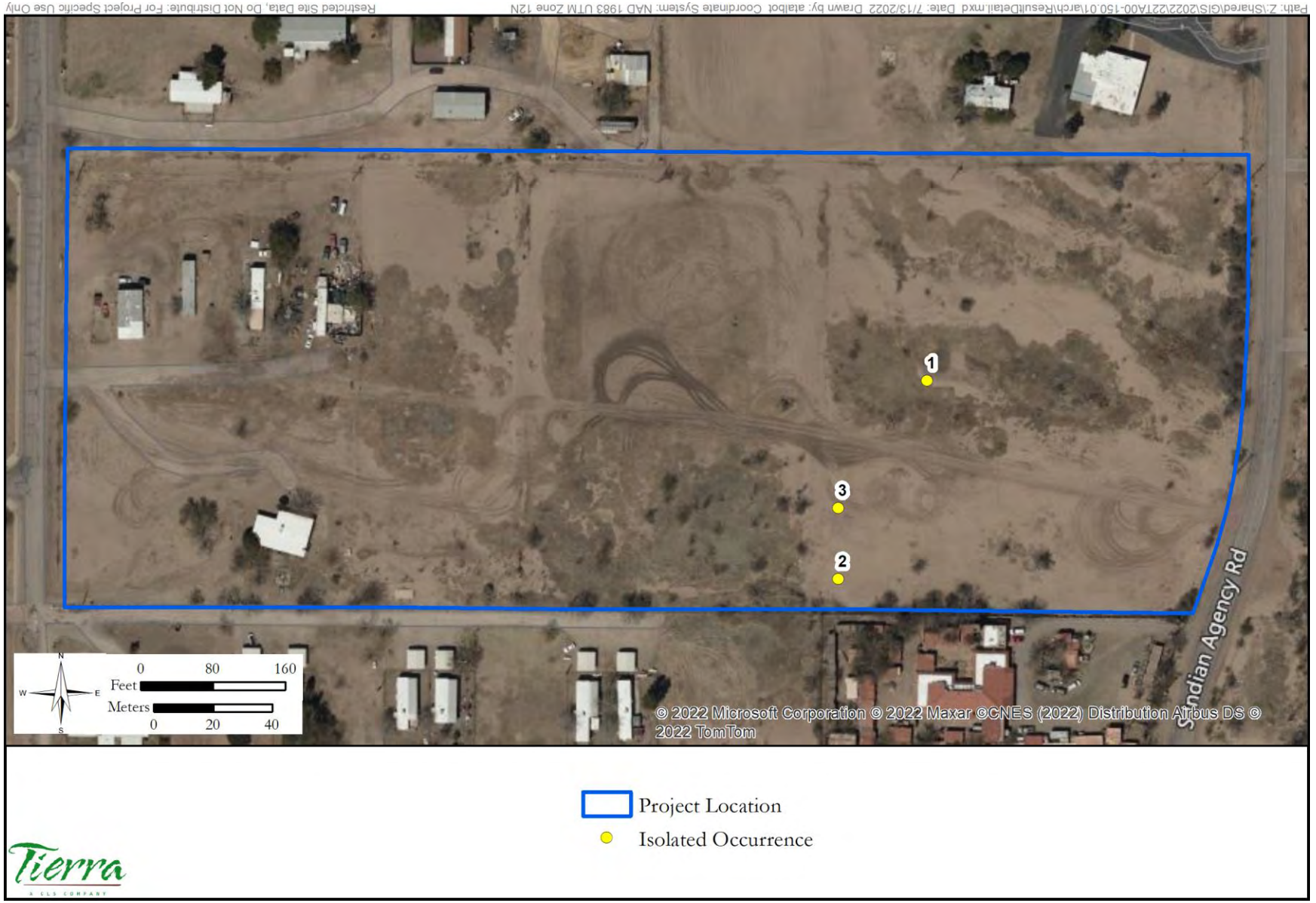


Figure 5. Results map.

Photo 1. Overview of project area, facing east.

Appendix E

Detailed Grading Plan & Cut/Fill Analysis

by

Bowman Consulting Group, Ltd.

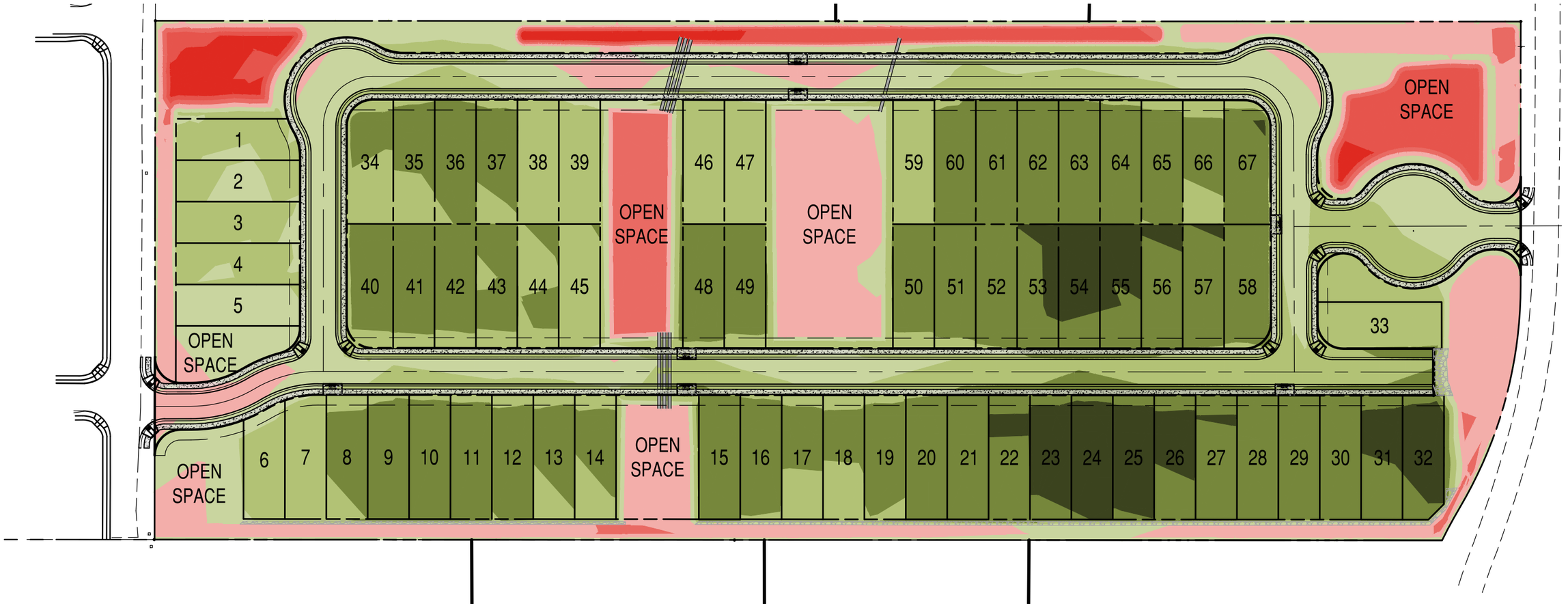
ELEVATIONS TABLE (CUTS)

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	−4.00	−3.00	7185.02	
2	−3.00	−2.00	18027.68	
3	−2.00	−1.00	19890.74	
4	−1.00	0.00	89257.15	

ELEVATIONS TABLE (FILLS)

Number	Minimum Elevation	Maximum Elevation	Area	Color
5	0.00	1.00	120956.50	
6	1.00	2.00	165789.30	
7	2.00	3.00	203835.10	
8	3.00	4.00	30254.54	

0 100 200



Bowman

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HEADLEY VALENCIA
PROPOSED CUT AND FILL EXHIBIT

SCALE:	1"=100'
DESIGN :	CS
JOB No.:	051281-01-001
DATE :	04/17/2023
EXHIBIT:	II-C.2