AGENDA
ORO VALLEY TOWN COUNCIL
REGULAR SESSION
May 4, 2016
ORO VALLEY COUNCIL CHAMBERS
11000 N. LA CAÑADA DRIVE

REGULAR SESSION AT OR AFTER 6:00 PM

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

UPCOMING MEETING ANNOUNCEMENTS

COUNCIL REPORTS

DEPARTMENT REPORTS

The Mayor and Council may consider and/or take action on the items listed below:

ORDER OF BUSINESS: MAYOR WILL REVIEW THE ORDER OF THE MEETING

INFORMATIONAL ITEMS

CALL TO AUDIENCE – At this time, any member of the public is allowed to address the Mayor and Town Council on any issue ***not listed on today's agenda.*** Pursuant to the Arizona Open Meeting Law, individual Council Members may ask Town Staff to review the matter, ask that the matter be placed on a future agenda, or respond to criticism made by speakers. However, the Mayor and Council may not discuss or take legal action on matters raised during "Call to Audience." In order to speak during "Call to Audience" please specify what you wish to discuss when completing the blue speaker card.

PRESENTATIONS

1. Art Ambassador Sasha Case - Veteran and Youth Art Exhibit

CONSENT AGENDA
(Consideration and/or possible action)

A. Minutes - April 13 and 20, 2016

REGULAR AGENDA

1. DISCUSSION AND POSSIBLE ACTION TO DESIGNATE A VETERANS AND FIRST RESPONDERS LIVING MEMORIAL AT NARANJA PARK

2. PUBLIC HEARING: ORDINANCE NO. (O)16-04, REZONING AN APPROXIMATE 141-ACRE PROPERTY LOCATED ON THE SOUTHEAST CORNER OF LA CHOLLA BOULEVARD AND LAMBERT LANE FROM R1-144 TO R1-43 AND USE OF THE MINIMUM LOT SIZE AND BUILDING HEIGHT FLEXIBLE DESIGN OPTIONS

3. PUBLIC HEARING: ORDINANCE NO. (O)16-06, AMENDING SECTION 22.9 OF THE ORO VALLEY ZONING CODE REVISED RELATED TO MINOR FINAL PLAT AMENDMENTS

4. PUBLIC HEARING: RESOLUTION NO. (R)16-16, AUTHORIZING AND APPROVING AN INCREASE TO THE BASE RATE FOR THE STORMWATER UTILITY FEE, REPLACING RESOLUTION NO. (R)07-127

5. PUBLIC HEARING: ORDINANCE NO. (O)16-07, AMENDING THE TOWN OF ORO VALLEY TOWN CODE, CHAPTER 15, ARTICLE 24, SECTION 15-24-13, STORMWATER UTILITY FEE SYSTEM, SUBSECTIONS 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) AND 15-24-13(G)(4), DECREASING THE EQUIVALENT RESIDENTIAL UNIT (ERU) VALUE THEREBY INCREASING THE RATE FOR COMMERCIAL PROPERTIES FOR THE TOWN OF ORO VALLEY STORMWATER UTILITY; REPEALING ALL RESOLUTIONS, ORDINANCES, AND RULES OF THE TOWN OF ORO VALLEY IN CONFLICT THEREWITH; PRESERVING THE RIGHTS AND DUTIES THAT HAVE ALREADY MATURED AND PROCEEDINGS THAT HAVE ALREADY BEGUN THEREUNDER

6. DISCUSSION AND POSSIBLE ACTION REGARDING AN ENERGY EFFICIENCY IMPROVEMENT PROJECT AT THE ORO VALLEY COMMUNITY CENTER

7. DISCUSSION AND POSSIBLE DIRECTION FOR A REQUEST FOR PROPOSALS TO SELECT A FIRM TO ASSIST WITH THE RECRUITMENT OF THE NEW TOWN MANAGER

FUTURE AGENDA ITEMS (The Council may bring forth general topics for future meeting agendas. Council may not discuss, deliberate or take any action on the topics presented pursuant to ARS 38-431.02H)

CALL TO AUDIENCE – At this time, any member of the public is allowed to address the Mayor and Town Council on any issue ***not listed on today's agenda.*** Pursuant to the Arizona Open Meeting Law, individual Council Members may ask Town Staff to review the matter, ask that the matter be placed on a future agenda, or respond to criticism made by speakers. However, the Mayor and Council may not discuss or take legal action on matters raised during "Call to Audience." In order to speak during "Call to Audience" please specify what you wish to discuss when completing the blue speaker card.

ADJOURNMENT

POSTED: 4/27/16 at 5:00 p.m. by mrs

When possible, a packet of agenda materials as listed above is available for public inspection at least 24 hours prior to the Council meeting in the office of the Town Clerk between the hours of 8:00 a.m. – 5:00p.m.

The Town of Oro Valley complies with the Americans with Disabilities Act (ADA). If any person with a disability needs any type of accommodation, please notify the Town Clerk's Office at least five days prior to the Council meeting at 229-4700.

INSTRUCTIONS TO SPEAKERS

Members of the public have the right to speak during any posted public hearing. However, those items not listed as a public hearing are for consideration and action by the Town Council during the course of their business meeting. Members of the public may be allowed to speak on these topics at the discretion of the Chair.

If you wish to address the Town Council on any item(s) on this agenda, please complete a speaker card located on the Agenda table at the back of the room and give it to the Town Clerk. **Please indicate on the speaker card which item number and topic you wish to speak on, or if you wish to speak during "Call to Audience", please specify what you wish to discuss when completing the blue speaker card.**

Please step forward to the podium when the Mayor announces the item(s) on the agenda which you are interested in addressing.

1. For the record, please state your name and whether or not you are a Town resident.
2. Speak only on the issue currently being discussed by Council. Please organize your speech, you will only be allowed to address the Council once regarding the topic being discussed.
3. Please limit your comments to 3 minutes.
4. During "Call to Audience" you may address the Council on any issue you wish.
5. Any member of the public speaking must speak in a courteous and respectful manner to those present.

Thank you for your cooperation.

Town Council Regular Session **Item # 1.**

Meeting Date: 05/04/2016

Art Ambassador

Information

Subject

Art Ambassador Sasha Case - Veteran and Youth Art Exhibit

Summary

Attachments

No file(s) attached.

Town Council Regular Session **Item # A.**

Meeting Date: 05/04/2016

Requested by: Julie Bower **Submitted By:** Michelle Stine, Town Clerk's Office

Department: Town Clerk's Office

Information

SUBJECT:

Minutes - April 13 and 20, 2016

RECOMMENDATION:

Staff recommends approval.

EXECUTIVE SUMMARY:

N/A

BACKGROUND OR DETAILED INFORMATION:

N/A

FISCAL IMPACT:

N/A

SUGGESTED MOTION:

I MOVE to approve, (approve with the following changes) the April 13, 2016 and April 20, 2016 minutes.

Attachments

4/13/16 Draft Minutes

4/20/16 Draft Minutes

MINUTES
ORO VALLEY TOWN COUNCIL
SPECIAL SESSION / BUDGET STUDY SESSION
April 13, 2016
ORO VALLEY COUNCIL CHAMBERS
11000 N. LA CANADA DRIVE

SPECIAL SESSION AT OR AFTER 4:00 PM

CALL TO ORDER

Mayor Hiremath called the meeting to order at 4:01 p.m.

ROLL CALL

PRESENT: Satish Hiremath, Mayor
Lou Waters, Vice Mayor
Brendan Burns, Councilmember (Attended via telephone)
Bill Garner, Councilmember (Attended via telephone)
Joe Hornat, Councilmember
Mary Snider, Councilmember
Mike Zinkin, Councilmember

SPECIAL SESSION AGENDA

1. DISCUSSION AND POSSIBLE DIRECTION REGARDING THE PROCESS TO APPOINT AN INTERIM TOWN MANAGER

Mayor Hiremath presented item #1.

Discussion ensued amongst Council and staff regarding the appointment process for an Interim Town Manager.

Town Council directed staff to seek to fill the Interim Town Manager position internally by requesting that interested employees submit a letter of interest by the close of business on Monday, April 18, 2016. Council would meet with interested employees in Executive Session and possibly appoint an Interim Town Manager at its regular meeting on April 20, 2016.

BUDGET STUDY SESSION AT OR AFTER 4:00 PM

CALL BUDGET STUDY SESSION TO ORDER

Mayor Hiremath called the meeting to order at 4:18 p.m.

DRAFT

BUDGET STUDY SESSION AGENDA

1. FY 2016/17 Town Manager's Recommended Budget Department Overviews

Town Manager Greg Caton announced the first budget presentation would be the Benefits overview, followed by Water Utility and Parks and Recreation, including Oro Valley Community Center.

Benefits Overview

Human Resource Director Gary Bridget introduced Oscar Diaz, Senior Vice President of CBIZ, and gave an overview of the proposed Benefits budget that included the following:

- Self-Funded Health Insurance Overview
- Benefit Cost Overview
- Healthcare Premium Contributions

Mr. Diaz gave an overview of the following proposed Benefit budget highlights:

- FY 16/17 UHC Plan Changes
- Comparison: Self-Funded vs. Fully Insured
- Historical findings according to United Healthcare
- FY 16/17 Medical Plan Contribution Share
- FY 16/17 Dental Plan Contribution Share

Following the presentation, there were questions and comments from Council regarding the proposed Benefits budget.

Councilmember Burns arrived to the meeting at 4:44 p.m.

Water Utility

Philip Saletta, Water Utility Director, gave an overview of the proposed Water Utility budget that included the following:

- Oro Valley Water Utility Funds
- Operating Fund Budget
- Impact Fee Funds
- All Water Utility Budgets

Following the presentation, there were questions and comments from Council regarding the proposed Water Utility budget.

Parks and Recreation, including Oro Valley Community Center

DRAFT

Parks and Recreation Director Kristy Diaz-Trahan and Development and Infrastructure Services Director Paul Keesler gave an overview of the following proposed Parks and Recreation, budget highlights:

- Strategic Plan Implementation
- Parks, Recreation, and Cultural Development
  - Parks & Recreation Budget
  - Recreation Programming
  - Special Events (community-based)
  - Sport Tourism
  - Cultural Resources
  - Community Center and Golf & Contracted Operations
  - Capital Improvement Projects ($596,000)

The following items were presented but were not included in the Parks and Recreation budget:

- Parks, Recreation and Cultural Development
  - Swings at Riverfront Park - Option #1
  - Swings at Riverfront Park - Option #2

Following the presentation, there were questions and comments from Council regarding the proposed Parks and Recreation budget.

Mayor Hiremath recessed the meeting at 5:58 p.m.

Mayor Hiremath reconvened the meeting at 6:10 p.m.

Vice Mayor Waters left the meeting at 6:10 p.m.

The discussion between Council and staff regarding the proposed Parks and Recreation budget continued.

Mr. Caton introduced Rob DeMore, Vice President of Troon Golf.

Mr. DeMore answered Council's questions regarding the golf portion of the proposed Parks and Recreation budget.

Discussion continued amongst Council, staff and Mr. DeMore regarding the proposed Parks and Recreation budget.

ADJOURNMENT

MOTION: A motion was made by Councilmember Zinkin and seconded by Councilmember Snider to adjourn the meeting at 6:48 p.m.

DRAFT

MOTION carried, 6-0.

Prepared by:

_____
Michelle Stine, CMC
Senior Office Specialist

I hereby certify that the foregoing minutes are a true and correct copy of the minutes of the special session / budget study session of the Town of Oro Valley Council of Oro Valley, Arizona held on the 13th day of April 2016. I further certify that the meeting was duly called and held and that a quorum was present.

Dated this ____ day of _____, 2016.

_____
Julie K. Bower, MMC
Town Clerk

DRAFT

MINUTES
ORO VALLEY TOWN COUNCIL
REGULAR SESSION
April 20, 2016
ORO VALLEY COUNCIL CHAMBERS
11000 N. LA CANADA DRIVE

REGULAR SESSION AT OR AFTER 5:00 PM

CALL TO ORDER

Mayor Hiremath called the meeting to order at 5:00 p.m.

ROLL CALL

PRESENT:	Satish Hiremath, Mayor Lou Waters, Vice Mayor Joe Hornat, Councilmember Mary Snider, Councilmember Mike Zinkin, Councilmember
ABSENT:	Brendan Burns, Councilmember Bill Garner, Councilmember

EXECUTIVE SESSION - Pursuant to ARS 38-431.03 (A) (1) and ARS 38-431 (A) (4) to discuss personnel matters regarding the resignation of Town Manager Greg Caton and contract negotiations and settlement discussions and Pursuant to ARS 38-431.03 (A) (1) to discuss personnel matters - conducting interview of internal interim Town Manager candidate

MOTION: A motion was made by Councilmember Snider and seconded by Councilmember Zinkin to go into Executive Session at 5:01 p.m. Pursuant to ARS 38-431.03 (A) (1) and ARS 38-431 (A) (4) to discuss personnel matters regarding the resignation of Town Manager Greg Caton and contract negotiations and settlement discussions and Pursuant to ARS 38-431.03 (A) (1) to discuss personnel matters - conducting interview of internal interim Town Manager candidate.

MOTION carried, 5-0.

Mayor Hiremath said the following staff members would join Council in Executive Session: Town Manager Greg Caton, Town Attorney Gary Verburg, Police Chief Danny Sharp and Town Clerk Julie Bower.

Councilmember Burns joined the executive session via telephone after the roll was called.

REGULAR SESSION AT OR AFTER 6:00 PM

CALL TO ORDER

Mayor Hiremath called the meeting to order at 6:00 p.m.

ROLL CALL

PRESENT:	Satish Hiremath, Mayor Lou Waters, Vice Mayor Brendan Burns, Councilmember Joe Hornat, Councilmember Mary Snider, Councilmember Mike Zinkin, Councilmember
ABSENT:	Bill Garner, Councilmember

PLEDGE OF ALLEGIANCE

Mayor Hiremath led the audience in the Pledge of Allegiance.

UPCOMING MEETING ANNOUNCEMENTS

Communications Administrator Misti Nowak announced the upcoming Town meetings and events.

COUNCIL REPORTS

Mayor Hiremath attended an event today sponsored by public safety personnel at which they launched a new app called Pulse Point. The new app would show all of the public places near your location where AED's were located.

DEPARTMENT REPORTS

No reports were received.

ORDER OF BUSINESS

Mayor Hiremath re-organized the agenda as follows: Presentation #2 would be heard first under Presentations, Regular Agenda item #3 would be heard first under the Regular Agenda and Regular Agenda item #6 would be heard fourth.

INFORMATIONAL ITEMS

1. Letter of Appreciation - Town Clerk's Office & IT Department

DRAFT

CALL TO AUDIENCE

Oro Valley resident Don Bristow thanked Planning Manager Bayer Vella and his staff for using new, larger public meeting notice signs at the corner of La Cholla Blvd. and Lambert Lane which were easier to read in a moving vehicle. Mr. Bristow urged Council to be open to all ideas related to the management of the Community and Recreation Center in order to work as a seven member team to resolve any problems.

William Koehler was concerned with impaired drivers and encouraged Council to consider any measures that would help reduce impaired driving.

Oro Valley resident Phil Roper, a long-time bicycle enthusiast, said he didn't feel safe biking on the street due to a recent accident that killed a fellow biker at the corner of La Canada Dr. and Magee Rd. He encouraged Council to implement additional enforcement measures in the future to create a safer environment on the road for pedestrians and bicyclist.

PRESENTATIONS

2. Certificates of Appreciation to outgoing members of the Youth Advisory Council

Assistant to the Town Manager Chris Cornelison gave an overview of the Youth Advisory Council and thanked Jessica Hynd, Constituent Services Coordinator, Councilmember Snider and volunteers Marty Waters and Sue Bishop for their time and assistance with the Youth Advisory Council.

Mayor Hiremath and Councilmember Snider presented Certificates of Appreciation to the following outgoing members of the Youth Advisory Council:

Present	Not Present
President Tim Falter	Danika Lunnon
Treasurer Sophia Silva	Christian Trejo
Emily Mayberry	Samantha DiPalma
Kaitlyn Vlahoulis	Marco Dominguez
Josh Baca	

1. Amphi School District - STEM School

Monica Nelson, Associate Superintendent for Amphitheater public schools, spoke about the lengthy process that was involved to develop a plan and gain approval for the new STEM School.

Jim Burns, Manager of Operational Support, presented the proposed STEM School site plan and navigated a virtual tour of the school.

3. Introduction of new Visit Tucson Sports Manager Jeffrey John

DRAFT

Jeffrey John, Visit Tucson Sports Manager, introduced himself and said that he was excited and eager to work with Council and staff to increase sports tourism in the community and region.

CONSENT AGENDA

Councilmember Zinkin requested to remove item (B) from the Consent Agenda for discussion.

A. Minutes - April 6, 2016

MOTION: A motion was made by Vice Mayor Waters and seconded by Councilmember Zinkin to approve item (A).

MOTION carried, 6-0.

B. Fiscal Year 2015/16 Financial Update through February 2016

Councilmember Zinkin inquired about Police Department vacancy savings, Community Center golf cart and membership dues revenues and Community Center food and beverage revenues.

Discussion ensued amongst Council and staff regarding the Fiscal Year 2015/16 Financial Update through February 2016.

MOTION: A motion was made by Councilmember Zinkin and seconded by Vice Mayor Waters to accept item (B).

MOTION carried, 6-0.

REGULAR AGENDA

3. DISCUSSION AND POSSIBLE DIRECTION REGARDING THE DEVELOPMENT OF AN ORDINANCE THAT WOULD REQUIRE DRIVERS TO HAVE THEIR CELL PHONES IN HANDS FREE MODE WHILE DRIVING IN ORO VALLEY TOWN LIMITS

Vice Mayor Waters presented item #3.

Discussion ensued amongst Council and staff regarding the development of an ordinance that would require drivers to have their cell phones in hands free mode while driving in Oro Valley Town limits.

DRAFT

Town Council directed staff to research and draft an ordinance that would require drivers to have their cell phones in hands free mode while driving in Oro Valley Town limits.

Mayor Hiremath recessed the meeting at 7:19 p.m.

Mayor Hiremath reconvened the meeting at 7:28 p.m.

1. CONSIDERATION AND ACCEPTANCE OF THE ORO VALLEY WATER UTILITY COMMISSION ANNUAL REPORT, DATED APRIL 2016

Water Utility Director Philip Saletta presented item #1 and outlined the following:

-Purpose of the Report
-Various Sections of the Report

Water Utility Administrator Shirley Kiel presented item #1 and outlined the following:

-Customer Service
-Water Conservation Program
-Financial Highlights and Rates

Water Resources and Planning Manager Peter Abraham presented item #1 and outlined the following:

-Water Utility Operations
-Production and Distribution
-Water Quality
-Water Supply
-Groundwater Levels
-Engineering & Planning

MOTION: A motion was made by Councilmember Hornat and seconded by Councilmember Zinkin to accept the Water Utility Commission Annual Report dated April, 2016.

MOTION carried, 6-0.

2. POSSIBLE ACTION TO ACCEPT TOWN MANAGER'S RESIGNATION

Mayor Hiremath presented item #2 and thanked Mr. Caton for his dedicated service to the community.

MOTION: A motion was made by Mayor Hiremath and seconded by Councilmember Snider to accept the resignation of Town Manager Greg Caton with an effective date of June 2, 2016 at midnight.

DRAFT

MOTION carried, 6-0.

6. POSSIBLE ACTION TO APPOINT AN INTERIM TOWN MANAGER

MOTION: A motion was made by Councilmember Snider and seconded by Mayor Hiremath to Appoint Daniel G. Sharp, the Town's current Chief of Police, as Interim Town Manager effective June 2, 2016 at midnight.

MOTION carried, 6-0.

4. DISCUSSION AND POSSIBLE DIRECTION REGARDING POTENTIAL ORO VALLEY BONDING TO FUND AN INCUBATION CENTER AT INNOVATION PARK

Mayor Hiremath presented item #4.

Discussion ensued amongst Mayor Hiremath and Councilmember Zinkin regarding potential Oro Valley bonding to fund an incubation center at Innovation Park.

No direction was given to Town staff.

5. DISCUSSION AND POSSIBLE DIRECTION REGARDING ORO VALLEY BONDING TO FUND ADDITIONAL SPORTS FIELDS AT NARANJA PARK

Mayor Hiremath presented item #5.

Discussion ensued amongst Council and staff regarding possible funding of additional sports fields at Naranja Park.

Council directed staff to research and develop initial cost figures and potential revenue sources for adding a quadplex sports field at Naranja Park.

FUTURE AGENDA ITEMS

No future agenda items were requested.

CALL TO AUDIENCE

No comments were received.

ADJOURNMENT

MOTION: A motion was made by Vice Mayor Waters and seconded by Councilmember Snider to adjourn the meeting at 8:09 p.m.

MOTION carried, 6-0.

DRAFT

Prepared by:

_____
Michael Standish, CMC
Deputy Town Clerk

I hereby certify that the foregoing minutes are a true and correct copy of the minutes of the regular session of the Town of Oro Valley Council of Oro Valley, Arizona held on the 20th day of April, 2016. I further certify that the meeting was duly called and held and that a quorum was present.

Dated this _____ day of _____, 2016.

_____
Julie K. Bower, MMC
Town Clerk

DRAFT

Town Council Regular Session **Item # 1.**

Meeting Date: 05/04/2016

Requested by: Amanda Jacobs **Submitted By:** Amanda Jacobs, Town Manager's Office

Department: Town Manager's Office

Information

SUBJECT:

DISCUSSION AND POSSIBLE ACTION TO DESIGNATE A VETERANS AND FIRST RESPONDERS LIVING MEMORIAL AT NARANJA PARK

RECOMMENDATION:

Staff recommends approval.

EXECUTIVE SUMMARY:

On January 20, 2016, Council directed staff to determine the feasibility of building a Veterans and First Responders Memorial Park in Oro Valley and to then return in spring of 2016. The purpose of agenda item tonight is to provide Council with an update and request a Veterans and First Responders Living Memorial Park be designated at Naranja Park.

BACKGROUND OR DETAILED INFORMATION:

After receiving direction from Town Council, resident Dick Eggerding and Economic Development Manager Amanda Jacobs formed a Task Force consisting of the following:

- Victor Braun, Veteran
- Alan Dankwerth, Veteran and Chairman of the Greater Oro Valley Chamber of Commerce
- Steve Didio, Veteran/Oro Valley American Legion Post 132
- Dick Eggerding, Veteran
- Chief Cheryl Horvath, Mountain Vista Fire District
- Curt Stowell, Veteran
- Kay Williams, board member of the Greater Oro Valley Chamber of Commerce
- Officer Elijah Woodward, Oro Valley Police Department

The task force held two meetings and evaluated the best practices of two communities: Anthem's Veterans Memorial Park in Anthem, Arizona and a Veterans Memorial Park in Macomb Township, Michigan.

Staff, through the work of the task force, is recommending building a Veterans and First

Responders Living Memorial at Naranja Park to honor the men and women who served southern Arizona and our country in times of need. Currently, there are no Veterans and First Responders Living Memorials in southern Arizona, making this a unique opportunity for Oro Valley. The following organizations also support a Veterans and First Responders Living Memorial: the Hilton Tucson El Conquistador Golf and Tennis Resort, the Greater Oro Valley Chamber of Commerce, La Posada, Oro Valley American Legion Post 132, Golder Ranch Fire District, Splendido at Rancho Vistoso, the Splendido Veterans Committee, Southern Arizona Rescue Association and Mountain Vista Fire District.

If Council approves the recommendation, staff will work with the current task force on the following next steps:

- Work with an architect and/or artist on the design of the memorial to determine the cost
- Begin fundraising for the project

FISCAL IMPACT:

N/A

SUGGESTED MOTION:

I MOVE to (approve/deny) designating a Veterans and First Responders Living Memorial at Naranja Park as shown in Attachment 2.

Attachments

Letters of Support
Naranja Park Map

Hilton
TUCSON EL CONQUISTADOR
GOLF & TENNIS RESORT

April 4, 2016

Town of Oro Valley
Oro Valley Town Offices
Honorable Mayor Hiremath & Council
11000 N La Canada Drive
Oro Valley, AZ 85737

Re: Veterans & First Responders Living Memorial

Dear Honorable Mayor & Council:

This letter is in support of a Veterans & First Responders Living Memorial to be located in Naranja Park.

The Hilton El Conquistador Resort is in full support of the Veterans & First Responders Living Memorial as it is imperative that we remember and honor all those who have served to keep our country and community safe. Naranja Park, which is centrally located in the heart of our community, is an ideal site within Oro Valley for the memorial.

Thank you for your time and consideration of this important matter. We look forward to your support of the Veterans & First Responders Living Memorial.

Sincerely,

Ghee Alexander
General Manager

GREATER ORO VALLEY
Chamber of Commerce

7435 N. Oracle Rd., Suite 107
Oro Valley, AZ 85704
P: 520.297.2191
F: 520.742.7960
orovalleychamber.com

Chairman
Alan Dankwerth
Market Considerations

Chair-elect
El Ndoye
National Bank of Arizona

Secretary
Marcia Ring

Treasurer
Toni Dorsey
AAA Arizona

Past chair
Cathy Workman
Workman Insurance and Investments

Directors

Greg Durnan
Acacia IT

Jeff Artzi
Vistoso Automotive

Jeff Saunders
America's Mattress

Mark Mitchell
Quick Mitchell and Maish CPAs

Kay Williams
Oro Valley Community Foundation

Cindy Webb Hanson
BMO Harris Bank

Mary Carter

Bruce Baca
Pima Federal Credit Union

Ghee Alexander
The Hilton Tucson El Conquistador Golf & Tennis Resort

Randy Karrer
Golder Ranch Fire District

Ex-officio

Amanda Jacobs
Town of Oro Valley

April 5, 2016

Mayor Satish I. Hiremath
Members of the Town Council
Town staff

Ladies and gentlemen,

The Greater Oro Valley Chamber of Commerce supports community efforts to create a Veterans and First Responders Living Memorial in the community.

Oro Valley is home to many veterans, and we should pursue this tangible tribute to their sacrifices. Likewise, first responders put their well-being on the line daily, and should know we appreciate what they do through the creation of this living memorial.

Naranja Park has ample space for such a place, and its increasing presence in Oro Valley life means the memorial would be visible and visited.

Your consideration is appreciated. Please let us know how we can be of service in this endeavor.

Respectfully submitted,

Dave Perry
President / CEO
Greater Oro Valley Chamber of Commerce
On behalf of the Chamber board of directors

La Posada

March 23, 2016

Oro Valley Town Council
11000 N. La Canada Drive
Oro Valley, AZ 85737

Dear Honorable Mayor and Council:

I am writing to support the Veterans and First Responders Living Memorial to be located in Naranja Park.

These two groups of courageous men and women work each day to serve and protect our national security, as well as our local communities. On a regular basis, they keep us safe from a variety of dangerous situations, and put their own lives and well being on the line to do so. These are special people, with a special sense of dedication to serving their fellow citizens, and they deserve the honor and respect that come from choosing such a path.

I am proud to add my voice to all the others who feel strongly that our heroic veterans and first responders should be recognized by this living memorial to them.

Thank you.

Sincerely,

Lisa Israel
President & CEO

Administration & Marketing
350 E. Morningside Road
Ph: (520) 648-8131
Fax: (520) 648-8397

La Vista Apartments & Garden Homes
501 S. La Posada Circle
Ph: (520) 648-8100
Fax: (520) 648-8137

La Perla Apartments
635 S. Park Centre Avenue
Ph: (520) 393-6500
Fax: (520) 393-6505

Holmlund Assisted Living & Armstrong La Via Memory Care
750 S. La Posada Circle
Ph: (520) 648-8400
Fax: (520) 648-8469

La Posada Healthcare & Therapies
700 S. La Posada Circle
Healthcare Ph: (520) 648-8381
Therapies Ph: (520) 648-2200
Fax: (520) 648-8389

Green Valley, AZ 85614
www.laposadagv.com

Oro Valley Post 132

March 2016

Mayor and Town Council
Town of Oro Valley
Oro Valley, AZ 85737

Dear Mayor Hiremath and Town Council Members,

I am writing to you to express the strong support of Oro Valley American Legion Post 132 for the proposed Veterans and First Responders Living Memorial to be constructed in Oro Valley's Naranja Park. As you are aware, there is no such Memorial in Southern Arizona, and it would be a credit to the Town of Oro Valley to be the first municipality to construct one. Ours is a very patriotic town, and a highly fitting location for this project. I also believe it is very fitting and appropriate for Veterans and First Responders to be honored within the same memorial, as their service to the nation is of the highest magnitude.

The nearly 400 local members of Post 132 are very enthusiastic and highly positive about this proposed Memorial being built in our town. I am sure a large number of our 100% Veteran membership will be highly supportive, both financially and through volunteerism, to bring this very important project to fruition. Our proud veteran membership strongly encourages the Town of Oro Valley to fully support the construction of a Veterans and First Responders Living Memorial, which will be a great source of pride for the town for decades to come!

Thank you for your support of this project!

Very Respectfully,

Steve Asp

Steve Asp
Commander
Oro Valley American Legion Post 132

Oro Valley Post 132, LLC P.O. Box 69665 Oro Valley, AZ 85737 ovpost132@gmail.com

GOLDER RANCH FIRE DISTRICT

Fire ♦ Rescue ♦ Medical
3885 E. Golder Ranch Drive
Tucson, Arizona 85739
(520) 825-9001

Randy Karrer, Fire Chief

March 22, 2016

Oro Valley Town Council
11000 N. La Cañada Drive
Oro Valley, Arizona 85737

Dear Honorable Mayor and Council,

I am writing to support the Veterans and First Responders Living Memorial at Naranja Park. The memorial would provide the Town of Oro Valley community a place to recognize the efforts and commitment of our public safety and military members. These every day heroes selflessly devote their time and energy to ensure a safe community for all of us. A living memorial would help to remind us all of the sacrifices they make.

Sincerely,

Randy Karrer
Fire Chief
Golder Ranch Fire District

March 29, 2016

Oro Valley Town Council
11000 N. La Canada Drive
Oro Valley, AZ 85737

Dear Honorable Mayor and Council:

On behalf of Splendido at Rancho Vistoso, we are pleased to support the Veteran's and First Responders Living Memorial project at Naranja Park.

Our community is home to over 100 Veterans, several of whom make up an active Veteran's Committee here at Splendido. We are very proud of the contributions our Veterans and First Responders have made, and continue to make, and we strongly support your efforts to build a memorial where citizens of Oro Valley can honor our Veterans and First Responders. We look forward to the time in the near future when they will have the opportunity to attend ceremonies and activities at the memorial.

I wish you and the Town Council every success with this endeavor.

Sincerely,

Thomas A Rios
Experience Director

13500 N. Rancho Vistoso Blvd. • Tucson, AZ 85755 • (520) 878.2600 • www.splendidotucson.com

Splendido AT RANCHO VISTOSO™

Splendido Veterans Committee
13500 N. Rancho Vistoso Blvd
Oro Valley AZ 85755

Oro Valley Town Council
11000 N. La Canada Drive
Oro Valley AZ 85737

The Honorable Mayor and Town Council,

The Splendido Veterans Committee is writing in support of the proposed Veteran's and First Responder's Living Memorial at Naranja Park. This undertaking indicates why those who live in Oro Valley feel privileged. The Veterans Committee which represents over 100 Splendido Veteran residents approve of this project.

Respectfully

Colonel William D. Carr U.S.Marine Corps (ret)

Chairman

SOUTHERN ARIZONA RESCUE ASSOCIATION

Oro Valley Town Council
11000 N. La Canada Drive
Oro Valley, Arizona 85737

Dear Honorable Mayor and Council:

We are writing to show our support for the Veterans and First Responders Living Memorial at Naranja Park. Our organization, all volunteer Southern Arizona Rescue Association, has been responding to the needs of Oro Valley and Pima County for almost sixty years. It is an honor to show our support for this unique and wonderful project.

Sincerely,

Eric K. Davis
President, Southern Arizona Rescue Association

MOUNTAIN RESCUE

SOUTHERN ARIZ. SAVE LIVES RESCUE ASSN.

P.O. Box 12892 Tucson, Arizona 85732

MOUNTAIN VISTA FIRE DISTRICT

COMMUNITY FIRST

April 15, 2016

Mayor and Town Council
Town of Oro Valley
11000 N. La Canada Dr.
Oro Valley, AZ 85737

Dear Mayor Hiremath and Council Members,

I am writing in strong support of Oro Valley American Legion Post 132 for the Veterans and First Responders Living Memorial that is proposed for construction at Naranja Park.

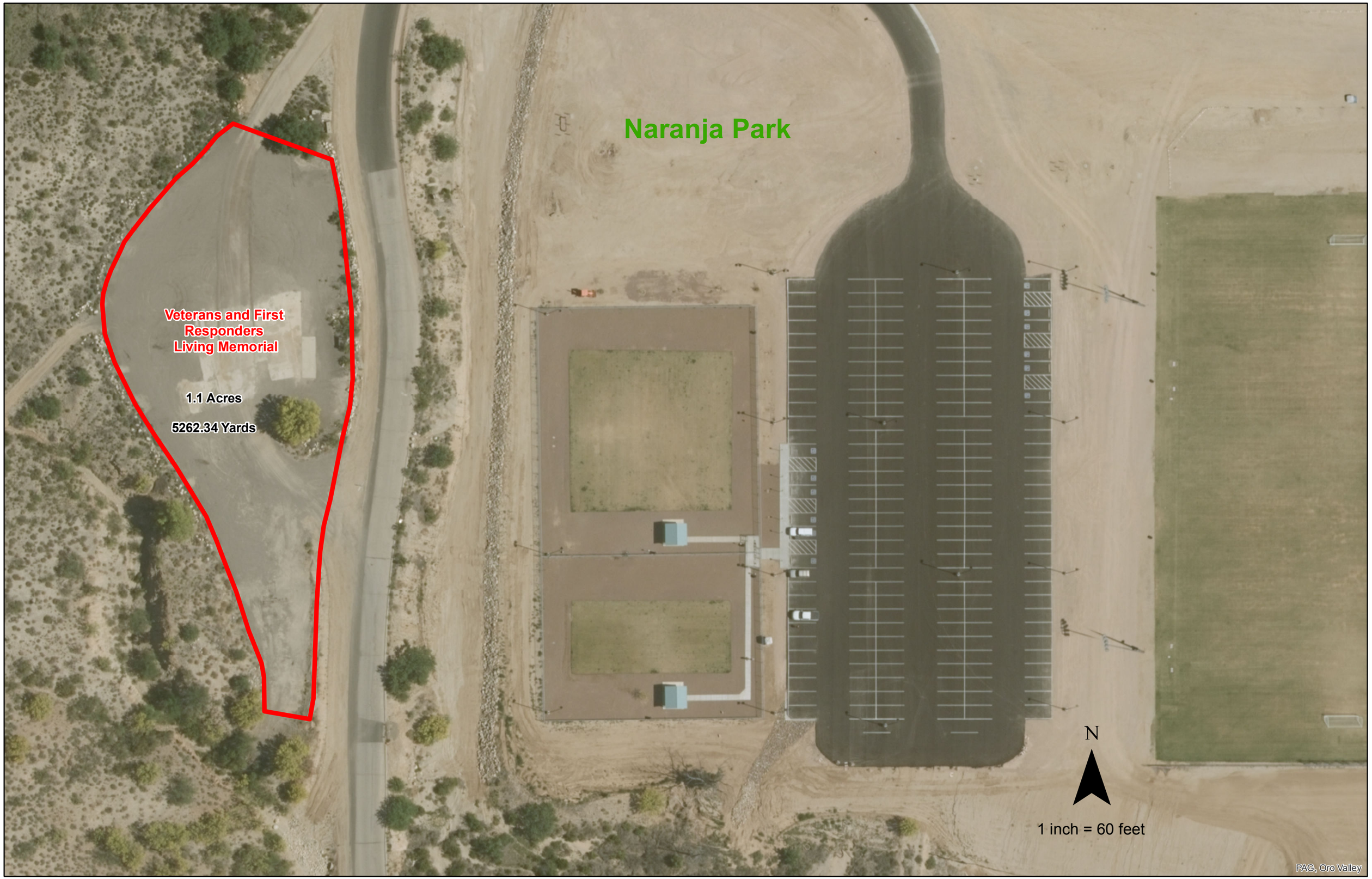
The men and women of Mountain Vista Fire District who serve the Oro Valley community are humbled to see a memorial that embodies the courage, dedication and commitment of all Southern Arizona veterans and first responders. We believe that this memorial will benefit Southern Arizona and the town of Oro Valley by reflecting the dedication of those who have served and lost their lives in the line of duty from not only Southern Arizona but throughout our proud nation.

As first responders, we are proud of our community and feel privileged to lend our support to this project.

Your support of this project is encouraged and greatly appreciated.

Sincerely,

Cheryl Horvath
Fire Chief


Naranja Park
Veterans and First Responders Living Memorial
1.1 Acres
5262.34 Yards
N
1 inch = 60 feet
PAG, Oro Valley

Town Council Regular Session **Item # 2.**

Meeting Date: 05/04/2016

Requested by: Bayer Vella

Submitted By: Michael Spaeth, Development Infrastructure Services

Department: Development Infrastructure Services

Information

SUBJECT:

PUBLIC HEARING: ORDINANCE NO. (O)16-04, REZONING AN APPROXIMATE 141-ACRE PROPERTY LOCATED ON THE SOUTHEAST CORNER OF LA CHOLLA BOULEVARD AND LAMBERT LANE FROM R1-144 TO R1-43 AND USE OF THE MINIMUM LOT SIZE AND BUILDING HEIGHT FLEXIBLE DESIGN OPTIONS

RECOMMENDATION:

The Planning and Zoning Commission recommends approval, subject to the conditions in Attachment 1. The Commission considered a request from the applicant for the modified review process, which was not supported. The applicant is no longer requesting use of the modified review process.

EXECUTIVE SUMMARY:

The purpose of this request is to consider a request for rezoning from R1-144 to R1-43 for an approximate 141-acre property located on the southeast corner of Lambert Lane and La Cholla Boulevard. The Tentative Development Plan, included in Attachment 2, includes:

- 91 single-family homes with a minimum lot size of 10,000 square feet
- Preservation of over 75% of the site as open space
- An approximate 425-foot setback along the eastern property line and a 150-foot setback along the southern property line
- Pedestrian and equestrian trails and trail heads throughout the site
- Two points of ingress/egress with access to Lambert Lane and La Cholla Boulevard
- Regional drainage improvements to address existing issues

The character of the La Cholla Corridor will be different in the future as a result of two key regional changes:

1. The widening of La Cholla Boulevard
2. Town Council approval of the La Cholla/Naranja General Plan Amendment to allow 570 potential future home sites and commercial developments

Though the roadway widening is anticipated to be completed in the summer of 2019,

many of the land use changes will not occur in the near future, but rather in five or 10 years. Any development proposals within the corridor need to account for these future land use and transportation changes.

Throughout the process, a number of issues have been discussed, with drainage being the foremost concern for neighbors. The applicant has developed a drainage concept that goes beyond standard code requirements and improves downstream drainage conditions. As part of the drainage concept depicted on the Tentative Development Plan and discussed in the Site Analysis (Attachment 3), the applicant will be constructing a large regional detention basin for the Town. A condition (condition #5a) requires dedication of the regional basin to the Town, which will allow for better control of regular maintenance - the most common concern regarding detention basins.

Prior to the Planning and Zoning Commission hearing, staff received a sufficient number of legal protest letters from several property owners to trigger a requirement for a super-majority vote (6-1) of Town Council for approval. The proposed rezoning was considered by the Planning and Zoning Commission on February 2, 2016. The commission recommended approval of the applicant's request, not including use of the modified review process, subject to the conditions in Attachment 1. The applicant has subsequently withdrawn the modified review process request. The Planning and Zoning Commission staff report is provided in Attachment 4.

BACKGROUND OR DETAILED INFORMATION:

Land Use Context

The Location Map, General Plan Land Use Map and Zoning Map for the property and the surrounding area are depicted in the Planning and Zoning Commission staff report (Attachment 4).

Approvals to Date

- 2002: R1-144 zoning was established upon annexation of the property.

Regional Transportation and Land Use Changes

The character of the La Cholla Corridor will be different in the future as a result of several transportation and land use changes that (1) are anticipated to fundamentally impact the area over the next five or 10 years and (2) directly affect the appropriateness of the applicant’s proposal. A discussion is provided below of the two key changes.

I. La Cholla Boulevard

The Regional Transit Authority (RTA) is currently in the design phase to improve La Cholla Boulevard to four lanes from Overton Road (south of the subject property) to Tangerine Road, with an anticipated completion date of June 2019. The significance of the roadway expansion is summarized in the details provided below:

- The roadway is currently one of only two north-south roadways designated as major

arterials in the 2005 General Plan, the other being Oracle Road. La Cholla Boulevard has always been considered the alternative north-south route as traffic congestion on Oracle Road continues to increase.

- The traffic volume on La Cholla Boulevard is expected to rise approximately 200% by 2040 according to the RTA. The road will function not only as an alternative to Oracle Road, but as the primary roadway for many Oro Valley residents, surpassing even La Cañada Drive.
- La Cholla Boulevard will highly resemble La Cañada Drive with four-lanes separated by a landscaped median with pedestrian improvements.

Ultimately, the anticipated widening of La Cholla Boulevard is impacting land use patterns throughout the area. Typically, an intensification of land uses follows transportation changes such as the widening of a roadway as an increase in traffic volume supports the land use change. This pattern of development is recognized and encouraged in the General Plan.

II. La Cholla Corridor Land Use

In May 2015, Town Council approved a Major General Plan Amendment for an area encompassing approximately 190 acres northwest of the subject property (see Attachment 5). The scope of the Amendment included:

- Increased residential densities, a total potential of 570 units, for many of the properties adjacent to La Cholla Boulevard with lot sizes similar to those of the existing residential north of the subject property toward Tangerine Road, which are as small as 7,000 sq. ft. (see Attachment 6).
- Concentration of commercial near the Lambert Lane and La Cholla Boulevard intersection. Currently, two corners of the intersection (northeast and northwest) have neighborhood or regional commercial land use designations.

In summary, the widening of La Cholla Boulevard and the concentration of commercial near the intersection supports an increase in density for the subject property based on the anticipated land use changes. As envisioned in the General Plan, the applicant's proposed Tentative Development Plan (TDP) represents an increase in residential density that will make more efficient use of the planned infrastructure expansion and help support the future commercial.

DISCUSSION/ANALYSIS:

The applicant proposes to rezone approximately 141 acres from R1-144 to R1-43 to develop a 91-lot residential subdivision. The TDP includes:

- 91 single-family homes with a minimum lot size of 10,000 square feet. Many of the most visible homes to neighbors have been restricted to single-story to reduce any potential visual impacts
- Preservation of over 75% of the site as open space
- An approximate 425-foot setback along the eastern property line and a 150-foot setback along the southern property line
- Pedestrian and equestrian trails and trailheads throughout the site

- Two points of ingress/egress providing access to both Lambert Lane and La Cholla Boulevard
- Regional drainage improvements designed to reduce current flood concerns in the area

Rezoning applications are reviewed for conformance with the General Plan, including the Land Use Map, and the Vision, Goals and Policies and the Town of Oro Valley Zoning Code.

General Plan Conformance Analysis

The applicant's request has been reviewed for conformance with the General Plan Land Use Map, Vision, Goals and Policies.

The subject property is designated as Low Density Residential (0.4 – 1.2 homes per acre) on the General Plan Future Land Use Map. As detailed above, the applicant is proposing 91 lots on approximately 141 acres, representing a density of approximately 0.64 homes per acre. The proposed TDP is consistent with the General Plan Land Use Map.

The applicant's proposal is consistent with the Vision and Goals and Policies of the General Plan, specifically those related to:

- Environment
- Community Design
- Transportation
- Infrastructure

A detailed analysis relative to General Plan conformance of each is provided in the Planning and Zoning Commission staff report (Attachment 4). The plans conformance with two of the more prominent General Plan policies are discussed below:

Policy 1.1.1 *The Town shall promote clustering of development to protect environmentally sensitive areas and to preserve significant, passive use, natural open space within residential neighborhoods.*

The applicant's TDP proposes preservation of 75% of the property's natural open space. The subdivision design serves as a true example of a cluster subdivision protecting the environmentally sensitive areas. The applicant's proposal meets this General Plan Policy.

Policy 1.2.1 *The Town shall maintain a harmonious relationship between urban development and development of the transportation network.*

The planned expansion of La Cholla Boulevard to a four lane desert parkway represents a significant public investment in infrastructure to serve this area. The proposed increase in planned intensity, as envisioned in the General Plan, will promote the efficient use of this expanded infrastructure and represents a complimentary development.

Zoning Code Analysis

The application has also been reviewed for conformance with the Town of Oro Valley Zoning Code and the specific development standards of the R1-43 zoning district. In summary, the applicant's proposal is consistent with the proposed zoning district and a detailed analysis of the applications conformance is provided in the Planning and Zoning Commission staff report (Attachment 4). A discussion of several key Zoning Code issues is provided below.

I. Environmentally Sensitive Lands

Rezoning applications are required to comply with the requirements of the Environmentally Sensitive Lands (ESL) section of the Zoning Code. One of the primary objectives of the ESL requirements is the preservation of Environmentally Sensitive Open Space (ESOS) and other natural corridors. The subject property is characterized by several unique environmental constraints that limit the developable area, including:

- Significant hillsides and slopes. Approximately 29% of the site has regulated slopes in excess of 15% (see Exhibit E-2 in Attachment 3)
- Three washes, each designated as mapped FEMA floodplains (see Exhibit G in Attachment 3)

As a result of the environmental constraints of the site, the applicant's proposal uses a conservation subdivision design to protect environmental resources. The proposed subdivision represents a true conservation subdivision design by clustering the proposed homes away from neighboring properties and preserving approximately 75% of the site as contiguous ESOS. The amount of preserved open space is substantially more than the minimum required amount of ESOS as required in Table 27.10-2 (see Exhibit S in Attachment 3).

The applicant has proposed a revised drainage concept that goes beyond code requirements. The drainage concept includes additional detention to improve downstream drainage conditions. The concept incorporates several detention basins including a regional drainage basin the applicant will be building for the Town that is centrally located adjacent to the Lomas de Oro wash. Several conditions have been added to Attachment 1 requiring landscaping in and around all of the proposed detention basins throughout the property. Furthermore, the basins will be required to be constructed of permeable materials. Both requirements seek to ensure the basins blend into the landscape and are recognized as ESOS.

A condition has been added to Attachment 1 requiring the proposed roadway crossing over the Lomas de Oro wash to be constructed as a wildlife permeable bridge to maintain the integrity of the Critical Resource Area. With the condition, the applicant's proposed rezoning will be in conformance with the ESL standards.

A detailed analysis of the applications conformance with the ESL requirements is provided in the Planning and Zoning Commission staff report (Attachment 4).

II. Flexible Design Options

The ESL section of the Zoning Code enables the use of incentives, or flexible design options, for conservation subdivision designs. Flexible Design Options are available to development when ESOS is applied to 25% or more of the property. As discussed previously, the applicant's proposal provides approximately 75% ESOS. To achieve this level of open space preservation, the applicant is proposing to use the following Flexible Design Options which require Town Council approval:

- Minimum Lot Size: 43,560 square feet to 10,000 square feet
- Building Heights: 18 to 20 feet for 1-story and 28 feet for 2-story

The applicant has also requested the use of additional Flexible Design Options intended to conserve additional open space, which have been approved administratively, as enabled by the Zoning Code, and include the following:

- Internal building setbacks: Front - from 30 feet to 10 feet; Side - from 20 feet to 7.5 feet; Rear - from 40 feet to 20 feet
- Native Vegetation Preservation: Exempts the applicant from Native Plant Preservation requirements when preserving more than 50% of the site as ESOS
- Recreation Area: Allows permissible passive or active recreational amenities located within ESOS to be credited toward recreational area requirements

A further discussion and analysis of the applicant's requested flexible design options is provided in the Planning and Zoning Commission staff report (Attachment 4).

<u>Engineering</u>

Drainage:
Generally, rezoning requests require a drainage concept that does not increase the amount of drainage runoff impacts. In this case, the applicant has gone above these standard code requirements and developed a drainage concept that provides additional detention that improves the downstream drainage condition by decreasing the flow, affecting neighbors to the south of the project.

Three natural washes affect the subject property, flowing in a southerly direction through the development. All three washes have a FEMA Special Flood Hazard Area designation of "Zone A." A detailed drainage analysis was prepared by the applicant to determine existing 100-year stormwater runoff values flowing through each wash, at points entering and exiting the project boundaries.

The drainage system for the project shall be designed to ensure, among other requirements, that all proposed habitable structures adjacent to a wash will be protected from flooding and erosion. The increase of runoff resulting from constructed impervious surfaces will be mitigated by use of detention basins, which discharge into the existing watercourses. The detention basins will capture, hold, and release stormwater in a controlled manner to mimic existing conditions.

A significant component of the applicant's drainage concept will be the construction of a new regional detention basin located immediately adjacent to the Loma de Oro wash,

which will reduce existing peak flows by approximately 10%. A condition (condition #5a) has been included in Attachment 1 requiring the applicant to dedicate the basin to the Town upon completion. The foremost advantage of Town control of the basin is ensuring regular maintenance is conducted so the basin continues to function properly. All drainage basins, but specifically those designed on a regional scale, require regular maintenance to minimize the build-up of sediment that can reduce the effectiveness of the basin. Considering the regional impact of this basin, it is advantageous for the Town to have control over maintenance.

Additionally, the applicant has also proposed to control runoff exiting along the southeastern property line to contain the existing runoff that currently impacts downstream residences.

Finally, drainage exiting the southwestern property line will have a reduction in run-off as a result of additional improvements within the development. A local floodplain that impacts downstream residences near the southwestern property line will be detained onsite as part of the development.

Town staff supports the proposed drainage concept as it provides a benefit to downstream neighbors by alleviating existing flood conditions.

Traffic:
Though drainage has been the foremost concern for neighbors, several traffic concerns must be addressed as well. A summary of the key traffic issues is provided below:

- An access point is proposed to connect to La Cholla Boulevard. There are existing sight visibility safety issues related to this location which will be mitigated by the future La Cholla Boulevard widening project. However, if this development moves forward prior to the La Cholla Boulevard widening project, Condition #9 in Attachment 1 will require the applicant to construct a controlled access intersection (e.g. right-in/out only) or make other improvements to provide sufficient sight visibility for motorists.
- An second access point is proposed to connect to Lambert Lane. Both access points will require off-site left turn-lane improvements to serve the new development.

This development will generate an amount of traffic that is similar to other subdivisions located north along La Cholla Boulevard. The existing roadway network has existing capacity to accommodate the small increase in traffic volume, especially once the La Cholla widening project has been completed.

<u>Public Participation</u>

The public participation process has been extensive and productive. Five neighborhood meetings (3 traditional, 1 open house, 1 site visit) have been held concerning the applicant's proposal. Summaries of each neighborhood meeting have been provided in the Planning and Zoning Commission staff report (Attachment 4).

In addition to neighborhood meetings, the applicant and staff have met with concerned

neighbors on several occasions. Through the process, the applicant and some of the neighbors have been able to forge consensus on numerous key issues (see Attachment 7).

As discussed previously, the primary concern for neighbors has been the existing drainage issues; and the applicant has proposed a revised drainage concept that goes beyond standard code requirements and improves downstream drainage conditions. Staff and the applicant met with a group of concerned neighbors prior after the Planning and Zoning Commission hearing to present the applicant's revised design.The neighbors in attendance were receptive and supportive of the revised drainage concept.

Additionally, the applicant recently met with concerned neighbors to address several outstanding concerns. As a result, the applicant has revised the Tentative Development Plan (Attachment 2) to address several previous conditions of approval.

Staff has received additional correspondence (see Attachment 8) and several letters of formal protest (see Attachment 9) concerning the applicant's proposed rezoning. In accordance with State Law and the Zoning Code, a sufficient number of formal letters of protest have been received that will require a super-majority vote (6-1) of Town Council for approval.

A detailed discussion of the primary issues throughout the process and how the applicant has addressed them is provided in the Planning and Zoning Commission staff report (see Attachment 4).

This item was originally scheduled for Town Council consideration on April 6, 2016. The applicant requested the item be removed from the agenda to allow an opportunity to further address neighbor concerns. The applicant has since met with concerned neighbors and has revised the Tentative Development Plan to ensure all previous agreements are clearly represented.

Planning and Zoning Commission action

On February 2, 2016, the Planning and Zoning Commission recommended approval of the proposed rezoning, subject to the conditions listed in Attachment 1, not including use of the modified review process.

Drainage was the primary focus for many concerned neighbors who spoke during the meeting. The recommendation not to use the Modified Review Process was based on a number of outstanding questions regarding the drainage concept. The Planning and Zoning Commission meeting minutes are provided in Attachment 10.

As discussed previously, the applicant has revised the plan to incorporate a drainage concept that goes beyond standard code requirements to improve downstream drainage conditions.

FISCAL IMPACT:

Maintenance of the regional drainage basin is anticipated to cost approximately $2,000 annually.

SUGGESTED MOTION:

I MOVE to adopt Ordinance No. (O)16-04, approving the proposed rezoning and use of the minimum lot size and building height flexible design options, subject to the conditions included in Attachment 1, finding the request is consistent with the General Plan.

OR

I MOVE to deny Ordinance No. (O)16-04, not approving the proposed rezoning, based on a finding that _____.

Attachments

ATTACHMENT 1 - (O)16-04
ATTACHMENT 2 - TENTATIVE DEVELOPMENT PLAN
ATTACHMENT 3 - SITE ANALYSIS
ATTACHMENT 4 - PZC STAFF REPORT
ATTACHMENT 5 - LA CHOLLA COMMONS CONCEPT PLAN
ATTACHMENT 6 - LA CHOLLA AREA LOT SIZES
ATTACHMENT 7 - NEIGHBORHOOD CONSENSUS TABLE
ATTACHMENT 8 - ADDITIONAL CORRESPONDENCE
ATTACHMENT 9 - FORMAL LETTERS OF PROTEST
ATTACHMENT 10 - PZC MEETING MINUTES

ORDINANCE NO. (O)16-04

AN ORDINANCE OF THE TOWN OF ORO VALLEY, ARIZONA, APPROVING A REZONING REQUEST BY THE WLB GROUP, INC, FOR A 141 ACRE PROPERTY LOCATED ON THE SOUTHEAST CORNER OF LAMBERT LANE AND LA CHOLLA BOULEVARD TO BE REZONED FROM R1-144 TO R1-43 AND USE OF THE MINIMUM LOT SIZE, BUILDING HEIGHT FLEXIBLE DESIGN OPTIONS

WHEREAS, the WLB Group, Inc., (the "Applicant"), applied for a rezoning from R1-144 to R1-43 for a property located near the southeast corner of Lambert Lane and La Cholla Boulevard; and

WHEREAS, the gross site of the proposed rezoning is 141 acres; and

WHEREAS, the current zoning of R1-144 allows one lot per 144,000 square feet; and

WHEREAS, the Applicant wishes to change the zoning to R1-43 to develop 91 single-family homes with a minimum lot size of 10,000 square feet; and

WHEREAS, the Application also requests two flexible design options enabled by the Environmentally Sensitive Lands regulations: 1) minimum lot size of 10,000 square feet 2) increased building heights from 18 feet to 20 feet for 1-story homes and from 18 feet to 28 feet for 2-story homes,; and

WHEREAS, the Applicant's request for rezoning complies with the OVZCR; and

WHEREAS, the Applicant's request for rezoning complies with the applicable General Plan requirements; and

WHEREAS, on February 2, 2016, the Planning & Zoning Commission recommended approval subject to conditions for rezoning the property from R1-144 to R1-43 and two flexible design options with conditions; and

WHEREAS, the Town Council has duly considered the Applicant's request for rezoning of for a 141 acre property located on the southeast corner of Lambert Lane and La Cholla Blvd.

NOW, THEREFORE BE IT ORDAINED by the Mayor and Council of the Town of Oro Valley, Arizona that the rezoning requested as described in Exhibit "A" and depicted in Exhibit "B" by Paul Oland of WLB Group, Inc., (the "Applicant"), applied for a rezoning and requested flexible design options for the property located near the southeast corner of Lambert Lane and La Cholla Blvd is hereby approved with the conditions attached hereto as Exhibit "C".

NOW THEREFORE BE IT FURTHER ORDAINED that:

1. All Oro Valley ordinances, resolutions or motions and parts of ordinances, resolutions or motions of the Council in conflict with the provision of this Ordinance are hereby repealed.

2. If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

PASSED AND ADOPTED by the Mayor and Council of the Town of Oro Valley, Arizona on this 4th day of May, 2016.

TOWN OF ORO VALLEY

_____
Dr. Satish I. Hiremath, Mayor

ATTEST:

_____
Julie K. Bower, Town Clerk

Date: _____

APPROVED AS TO FORM:

_____
Tobin Sidles, Legal Services Director

Date: _____

EXHIBIT "A"

LEGAL DESCRIPTION OF PROPERTY

ALL of the Northwest Quarter of Section 15, Township 12 South, Range 13 East, Gila and Salt River Meridian, Pima County, Arizona.

EXCEPT the North 75.00 feet and the West 30.00 feet thereof.

AND FURTHER EXCEPTING the following described parcel:

COMMENCING at the Northwest corner of said Section 15, from which the North quarter corner of said Section 15 bears N 89°23'46" W (Basis of Bearings) a distance of 2635.70 feet as shown on the Record of Survey recorded in Book 69, Page 4, Pima County Records;

THENCE N 89°23'46" W, along the North line of said Northwest quarter of said Section 15, a distance of 442.94 feet;

THENCE leaving said North line, S 00°36'14" E, a distance of 75.00 feet to the **POINT OF BEGINNING**;

THENCE S 03°47'03" W, a distance of 41.04 feet;

THENCE S 10°42'39" E a distance of 161.18 feet;

THENCE S 07°39'08" E, a distance of 98.87 feet;

THENCE S 06°57'08" E, a distance of 112.01 feet;

THENCE S 02°01'12" W, a distance of 80.84 feet;

THENCE S 23°15'19" W, a distance of 164.58 feet;

THENCE S 40°32'25" W, a distance of 86.34 feet;

THENCE S 44°13'17" W, a distance of 78.16 feet;

THENCE S 40°33'26" W, a distance of 101.11 feet;

THENCE S 35°50'26" W, a distance of 76.00 feet;

THENCE S 43°09'21" W, a distance of 128.34 feet;

THENCE S 39°33'40" W, a distance of 124.48 feet to a point on the East right-of-way line of La Cholla Boulevard;

THENCE N 00°35'15" W, along said East line, a distance of 1085.86 feet to the South right-of-way line of Lambert Lane;

THENCE N 89°23'46" E, along said South line, a distance of 412.96 feet to the **POINT OF BEGINNING**.

Prepared by:

THE WLB GROUP, INC.

Peter D. Cote, RLS 44121

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
44121
PETER D.
COTE
Date Signed 4-19-16
ARIZONA, U.S.A.

EXPIRES 3-31-2018

EXHIBIT "B"

MAP OF PROPERTY

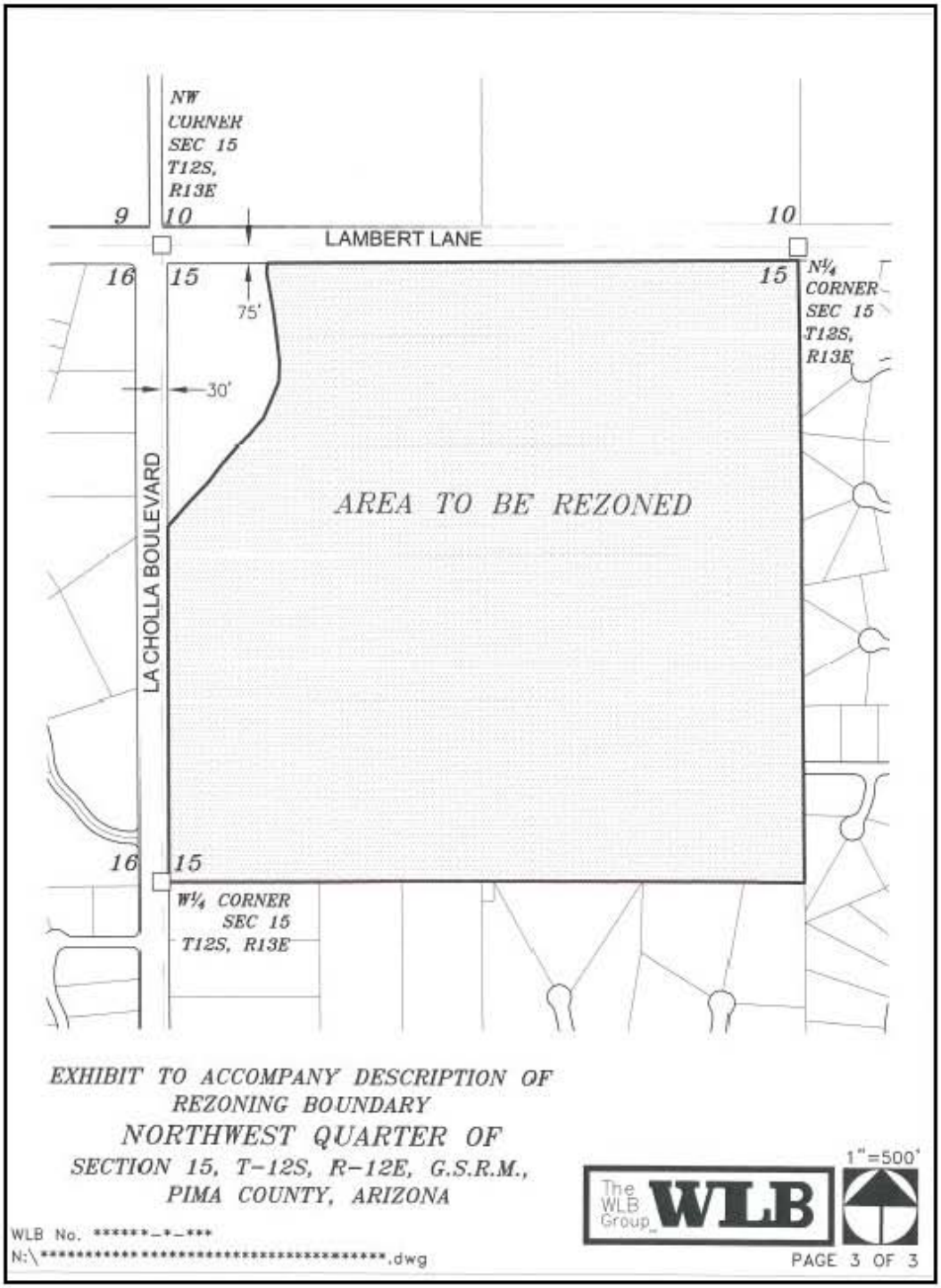


EXHIBIT "C"

CONDITIONS OF APPROVAL

Planning

1. The roadway crossing over the Lomas de Oro wash shall be designed to be a wildlife permeable bridge that does not impede wildlife movement within the wash.
2. The following General Notes listed on the Tentative Development Plan are conditions of approval:
    a. Maximum number of lots: 91
    b. Minimum lot size: 10,000 sq. ft.
    c. Maximum number of 10,000 sq. ft. minimum lot size lots: 18
    d. Minimum number of ½-acre minimum lot size lots: 73
    e. Internal building setbacks
        i. Front: 10 feet (minimum 20 feet for vehicle parking)
        ii. Side: 7.5 feet
        iii. Rear: 20 feet
    f. Maximum building height
        i. 1-story: 20 feet
        ii. 2-story: 28 feet
    g. Minimum percent of open space/common area: 75%
    h. Minimum percent of Environmentally Sensitive Open Space: 71%
    i. Corner lots restricted to single-story
    j. No more than two 2-story homes shall be located side-by-side on the same street
    k. Oro Valley Trail #161 will be protected as a non-motorized public access trail easement
    l. No roadway connections will be allowed between this development and the Rancho Feliz neighborhood to the east
3. All proposed drainage basins to be landscaped to reduce the visibility of the disturbed areas.
4. The off-line drainage basin adjacent to the Critical Resource Area, must be thoroughly landscaped around the perimeter and internally, to reduce the visibility of the disturbed area.

Engineering

5. In accordance with Section 11.3.11 of the Town of Oro Valley Drainage Criteria Manual, the applicant shall reduce the post-development outflow of drainage from the Lomas de Oro and Canyon Shadows Washes, or provide other means as approved by the Town Engineer, to improve the existing drainage within the downstream area. The reduction shall be to an amount that has the effect of making existing residential structures located on immediately adjacent downstream properties, as shown on the Tentative Development Plan, eligible to be removed from the floodplain.

    a. The regional on-site detention depicted on the Tentative Development Plan and discussed in the Site Analysis shall be designed and constructed so that the existing 100-year Lomas de Oro Wash peak flow is reduced by 10% where it exits the project's southern boundary. Furthermore, the basin shall be dedicated by the developer to the Town of Oro Valley upon successful inspection and acceptance by the Town Engineer and prior to the release of building permits.

    b. If the applicant is unable to construct the proposed off-site improvements depicted on the Tentative Development Plan and discussed in the Site Analysis, an on-site solution must be established and approved by the Town Engineer.

6. All critical drainage elements designed to protect downstream property owners must be in place by the onset of grading activities, as approved by the Town Engineer. The basins are to be in place and functional at the beginning of project construction to capture runoff and improve downstream conditions.

7. The applicant shall dedicate 55' of new right-of-way along the property's La Cholla Boulevard frontage.
8. The applicant shall provide a 30' easement along a portion of the new La Cholla Boulevard right-of-way for drainage improvements.
9. The applicant shall construct a controlled access intersection (e.g. right-in/out) or make other necessary improvements for safe sight visibility at the La Cholla access drive location as approved by the Town Engineer if this project is constructed prior to the La Cholla Boulevard widening project.
10. The applicant shall construct a multi-use path the length of the property's frontage along the south side of Lambert Lane.

LEGEND

- Proposed Schematic Basin Location
- Proposed Trail w/ Seating Nodes (15' Easement)
- ESL Critical Resource Areas: Preservation Required = 95%; Preservation Provided = 97%
- ESL Resource Management Area Tier 1: Preservation Required / Provided = 66%
- Trailhead
- Approximate Post-Development 100-Year Floodplain
- Existing Slopes Greater Than 25%
- s Single Story Restricted Lots (20')

GENERAL NOTES

A. Property Size: 143.3± ac. (141.7± ac. net after ROW dedications).

B. Existing General Plan Land Use: Low Density 1 (≤1.2 Homes per Acre).

C. Zoning request: R1-144 to R1-43.

D. Gross Residential Density: 1.7 Acres per Home.

E. Residential Lots: 91
- 86' x 254' (Min. ½-Acre): 73 Lots
- 80' x 125' (Min. 10,000 SF.): 18 Lots.

E. Open Space / Common Area: ~75% of Site.
ESOS Provided: ~71% of Site.

F. The future HOA of this development will be responsible for the permanent protection of the ESOS on this site, except any areas under the control of the Town.

G. Water service provider: Oro Valley Water.

H. Corner lots will be restricted to single-story, per Town Code.

I. No more than two 2-story homes shall be located side-by-side on the same street, per Town Code.

J. Oro Valley Trail #161 will be protected as a non-motorized public access trail easement.

K. ESLO Zoning Incentives (Section 27.10)
1. Building Setbacks: Front = 10'; Side = 7.5'; Rear = 20'.
2. Minimum Lot Size: 10,000 S.F.
3. Building Height: 20' (1-Story) & 28' (2-Story).
4. Recreation Area Credit.
5. Native Vegetation Preservation.

M. No roadway connections will be allowed between this development and the Rancho Feliz neighborhood to the east.

The WLB Group Inc. WLB
TUCSON - PHOENIX - LAS VEGAS - FLAGSTAFF
520.881.7480 - tucson@wlbgroup.com

EXHIBIT R
TENTATIVE DEVELOPMENT PLAN

2016.04.12
Contour Interval = 5 Ft.
WLB No. 114012-A-001
N.T.S.

OV914-009

LAMBERT AND LA CHOLLA, SOUTHEAST CORNER

REZONING SITE ANALYSIS

FOURTH SUBMITTAL 1.14.2016
REVISED 3.23.2016

Property Owner
Future Arizona Inc.
Contact: Peter Fasseas
1555 N Astor Street
Chicago, Illinois 60610

Prepared By
The WLB Group, Inc.
Contact: Paul Oland
4444 East Broadway Boulevard
Tucson, Arizona 85711
520.881.7480

WLB No. 114012-A-001

The WLB Group, Inc. WLB

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- Cultural Resources Survey by Tierra Right-of-Way Services

PART I – INVENTORY AND ANALYSIS

INTRODUCTION

The property owner proposes to entitle a 142± acre parcel at the southeast corner of Lambert Lane and La Cholla Boulevard, to allow for the development of approximately 91 single-family residential homes. The proposed development will be constructed in accordance with the provisions outlined in the Environmentally Sensitive Lands Ordinance (ESLO), and the Conservation Subdivision Design element. Proposed lot sizes will range from 10,000 square feet to half an acre, with open space buffers located near adjacent lower density residential areas. Over 75% of the site is proposed as undisturbed or improved open space.

I-A. Existing Land Uses

1. Site Location

The subject property consists of approximately 142± acres located near the southeast corner of La Cholla Boulevard and Lambert Lane. It is bounded by La Cholla Boulevard and Canada Hills Wash to the west, the Rancho Feliz subdivision to the east, Lambert Lane to the north, and the Lomas de Oro subdivision and unplanned development to the south. The Pima County Assessor designates the subject property as tax parcel 224-39-0020 in Township 12 South, Range 13 East, Section 15, Town of Oro Valley, Pima County, Arizona

Refer to *Exhibit A* for a location map of the subject property and to *Exhibit B* for an aerial photograph of the subject property.

2. Existing Land Uses – Onsite

The subject property is currently undeveloped and vacant.

The subject property is currently zoned R1-144 (Single-Family Residential District). Please refer to *Exhibit C: Existing Zoning*. The Town of Oro Valley General Plan designates the subject property as Low Density Residential (LDR-1).

3. Existing Adjacent Zoning and Land Uses

a/b. Please refer to *Exhibit C: Existing Land Uses* and *Exhibit D: Existing Zoning*. The subject property is surrounded by the following existing zonings, general plan designations and land uses:

General Plan, Zoning and Land Use			
	Existing General Plan	**Existing Zoning**	**Existing Land Use**
Subject Property	LDR-1 (Low Density Residential)	R1-144 (Single Family Residential)	Vacant
North	LDR-2 (Low Density Residential) NCO (Neighborhood Commercial/ Office)	C-2 (Commercial) R-6, Multi-family residential) R1-10 (Single-family residential)	Vacant
Northeast	Park	R1-144 (Single Family Residential)	West Lambert Ln. Park
East	LDR-1 (Low Density Residential)	R1-36 (single-family residential)	Rancho Feliz subdivision
Southeast	LDR-1 (Low Density Residential)	R1-36 (single-family residential)	Rancho Feliz subdivision
South	RLDR (Rural Low Density Residential)	R1-144 (Single Family Residential)	Lomas de Oro subdivision Un-subdivided residential lots
Southwest	RLDR (Rural Low Density Residential)	CR-1 (Pima County, Single Residence Zone)	Tecolote de Oro subdivision
West	LDR-2 (Low Density Residential)	R1-20 (Single-family residential)	Chaparral Heights
Northwest	NCO (Neighborhood Commercial/ Office)	R1-144 (Single Family Residential)	Vacant

c. Surrounding Building Heights

The majority of structures within a quarter-mile of the subject property are single-story, with the remaining minority of structures not exceeding two-stories.

d/e. Surrounding Rezonings

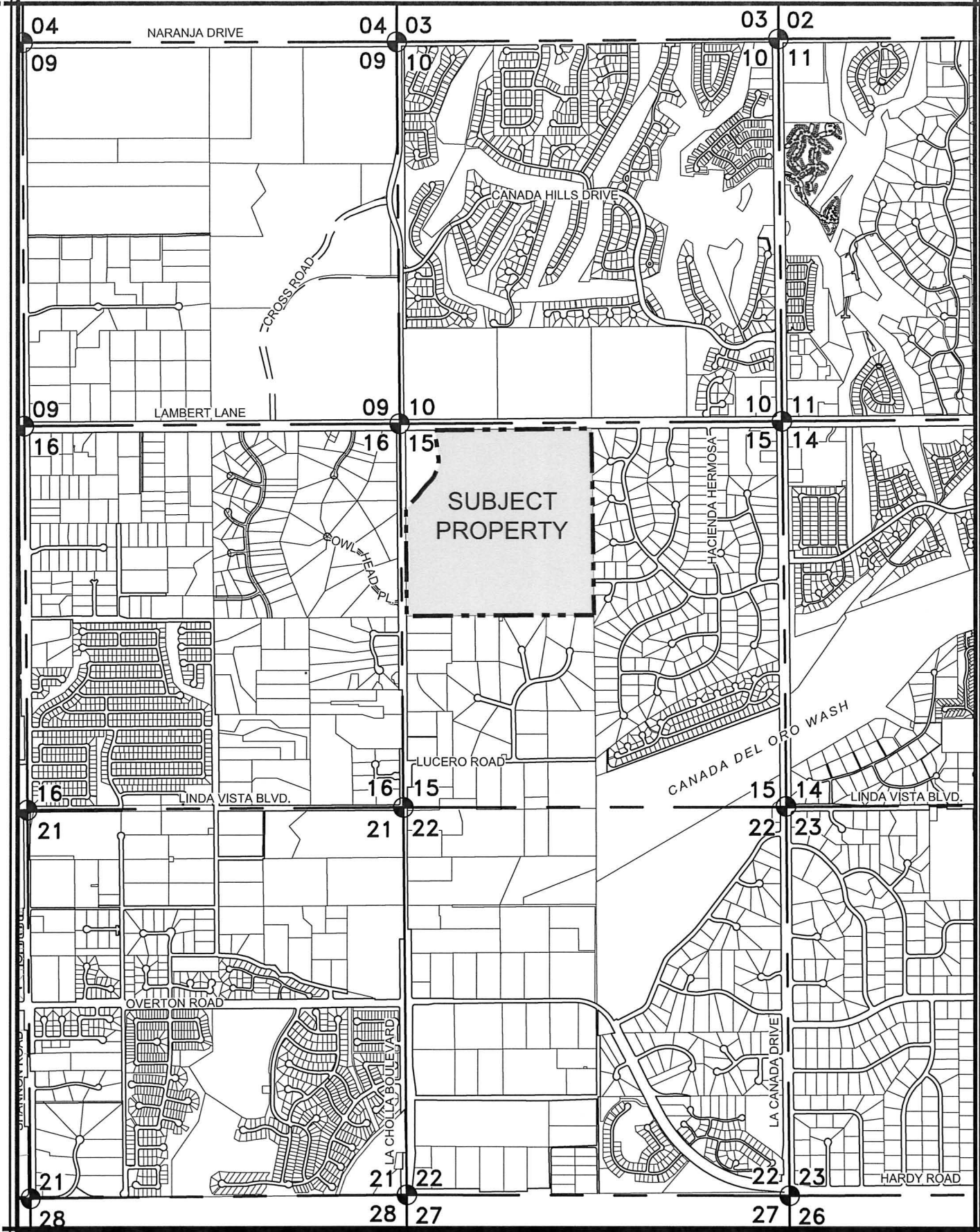
There are no pending or conditionally approved rezoning within one-quarter mile of the subject property. A major General Plan amendment was recently approved for the property to the northwest of the site.

f. There are no known pending subdivision and/or development plans within one-quarter mile of the subject property.

g. The architecture of existing homes in the area is mostly Contemporary or Mediterranean style.

4. Location and ownership of wells/well sites within 100 feet of site.

According to the Arizona Department of Water Resources, there are no wells located on or within 100 feet of the project site. The closest wells are located in excess of 800 feet to the west and 900 feet to the south.



The WLB Group Inc. **WLB**

EXHIBIT A
SITE LOCATION MAP

2014.10.06
WLB No. 114012-A-001

1/3 MILE

L:\114012\A-001 Rezoning\Exhibits\A - Site Location Map.dwg Plotted: Oct. 06, 2014

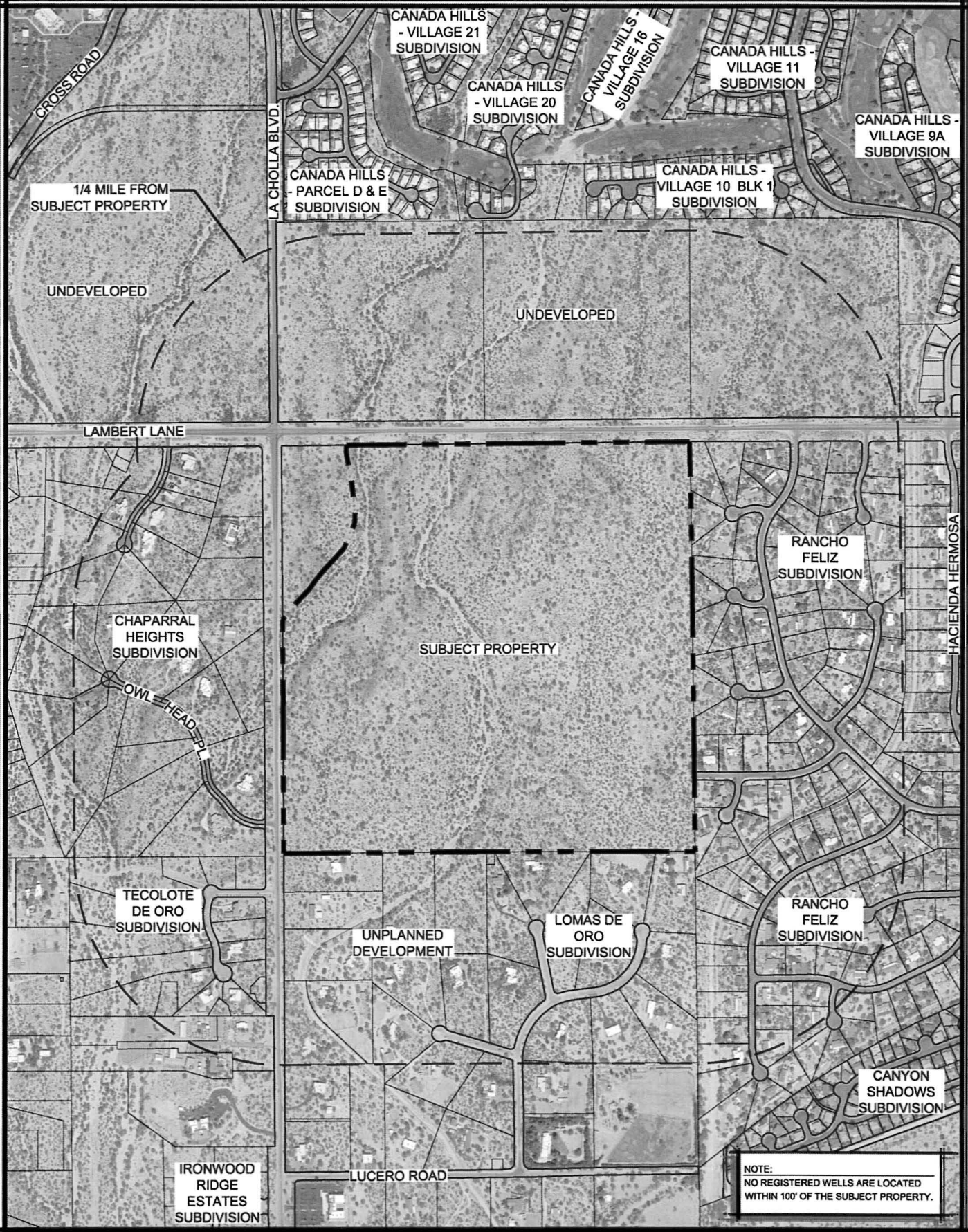
The WLB Group WLB

EXHIBIT B
AERIAL PHOTOGRAPH

2015.03.02
WLB No. 114012-A-001

0' 500'

L:\114012\A-001 Rezoning\Exhibits\B - Aerial Photograph.dwg Plotted: Mar. 03, 2015



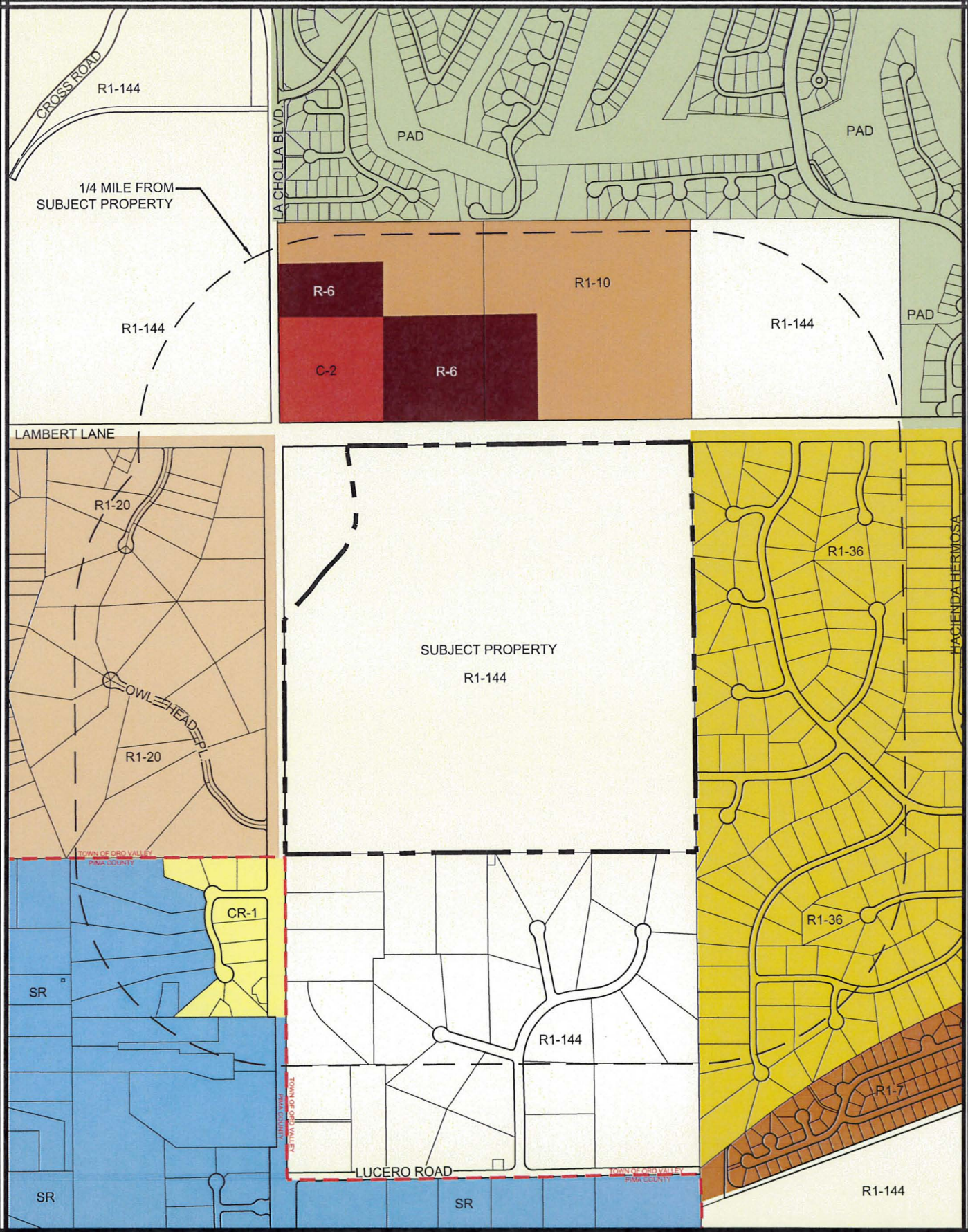
The WLB Group WLB

EXHIBIT C
EXISTING LAND USES

2014.09.17
WLB No. 114012-A-001

0' 800'

L:\114012\A-001 Rezoning\Exhibits\C - EX Land Uses.dwg Plotted: Oct. 06, 2014



The WLB Group Inc. **WLB**

EXHIBIT D
EXISTING ZONING

2014.07.30
WLB No. 114012-A-001

0' 800'

L:\114012\A-001 Rezoning\Exhibits\D - EX Zoning.dwg Plotted: Oct. 06, 2014

I-B. Topography

1. The topography of the subject property is characterized by rolling hills and braided washes. The subject property generally slopes downward, north to south, toward the Cañada del Oro Wash, located approximately one half mile south of the subject property. Refer to *Exhibit E-1: Topography* for a map of site topography.

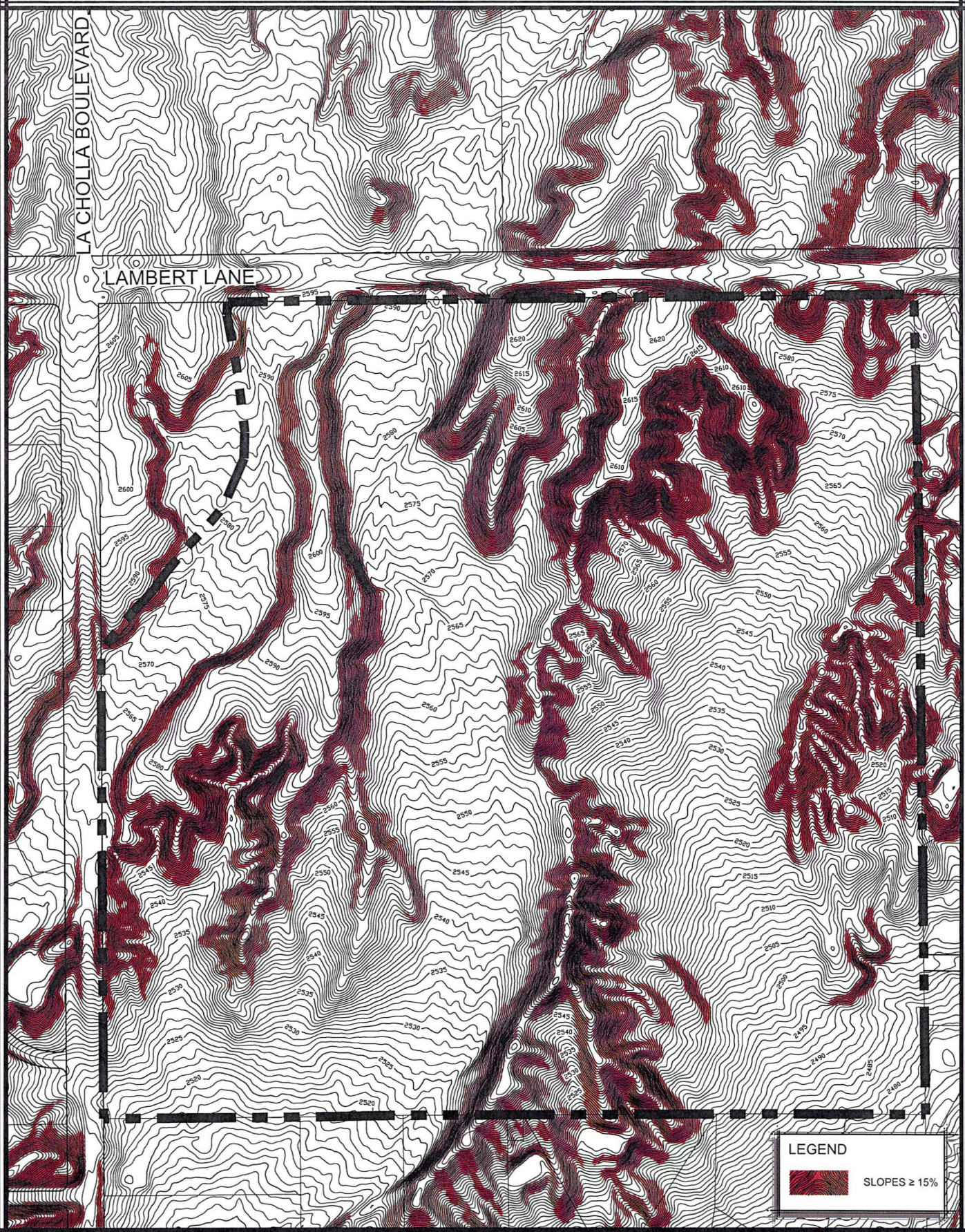
   Slopes less than 15% characterize the vast majority of the subject property. Elevations range from approximately 2,625 feet at its highest point in the north central portion of the subject property, to 2,475 feet at its lowest point on the southeast side of the subject property. Three washes traverse the site, creating low ridgelines. The limited number of areas of slope greater than 15% primarily exist along ridges between the washes. The site does not contain any restricted peaks/ridges, or rock outcrops. Refer to *Exhibit E-2: ESLO Slope Analysis* for a map of slopes on-site.

2. Slope Area Analysis

   The property was analyzed using the Hillside Area Category requirements in Section G of the Town's Environmentally Sensitive Lands Ordinance (ESLO). The slope categories used for this analysis coincide with the values provided in the Slope Density and Disturbance Limits table (Table 27.10-4 in the ESLO). The results of the slope analysis are below:

Slope Categories (per ESLO)	% of Site	Area (Ac.)	% of Allowed Disturbance Per ESLO Table 27.10-4	Allowable Disturbance Area (Ac.)
0% to 15%	72.8%	103.2±	100%	103.2±
15% to ≥18%	6.5%	9.2±	40%	3.7±
18% to ≥20%	3.9%	5.5±	30%	1.7±
20% to ≥25%	7.6%	10.7±	20%	2.1±
25% to ≥33%	6.8%	9.7±	5%	0.5±
33%+	2.4%	3.4±	4%	0.1±
		141.7±	**Total Allowable Disturbance***	**111.3±**

   *To determine the total allowable disturbance area of the subject property based only on slopes, the area of each slope category was multiplied by the respective percentage of allowable disturbance using the values listed in Slope Density and Disturbance Limits Table of the ESLO (Table 27.10-4). The sum of each of the slope categories' allowable disturbance areas results in the total allowable site disturbance area of approximately 111.3± acres (based only on regulated slopes and not additional development constraints on-site).



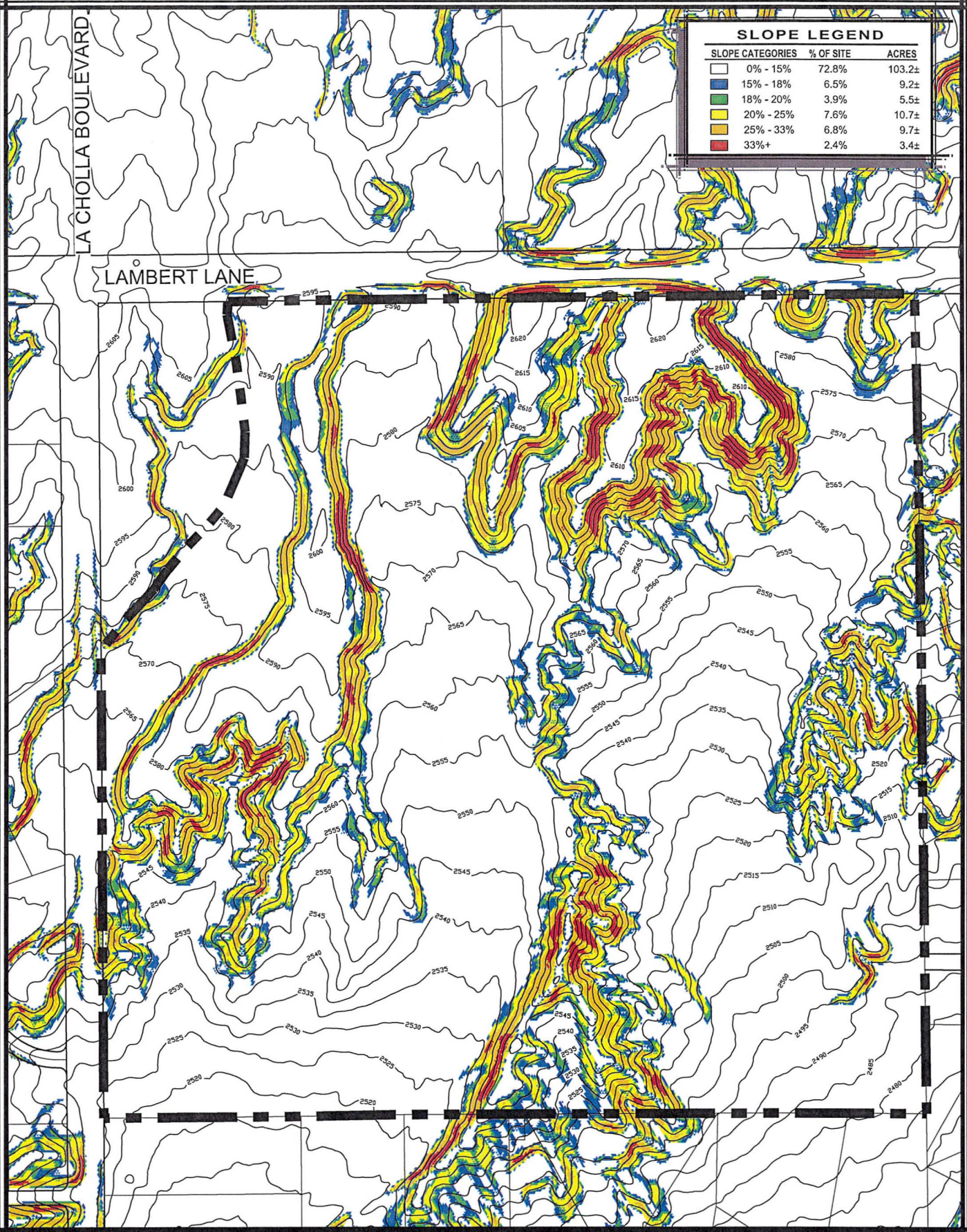
The WLB Group™ WLB

EXHIBIT E-1
TOPOGRAPHY

2014.09.19
Contour Interval = 1 Ft.
WLB No. 114012-A-001

0' 400'

L:\114012\A-001 Rezoning\Exhibits\E-1 - Topography.dwg Plotted: Oct. 06, 2014



The WLB Group WLB

EXHIBIT E-2
ESLO SLOPE ANALYSIS

Contour Interval = 5 Ft.
WLB No. 114012-A-001

0' 400'

L:\114012\A-001 Rezoning\Exhibits\OLDER\E-2 - ESLO Slopes.dwg Plotted: Dec. 04, 2015

I-C. Hydrology

1. Description and map (aerial photograph) of the perimeter of all off-site watersheds effecting, or affected by, the site, upstream and downstream.

   Please refer to *Exhibit F: Off-site Hydrology*.

   a. Notation of all balanced and critical basins.

      The entire Town is classified as a critical basin.

2. Description of significant off-site features, natural or man-made, with above watersheds effected by, or affecting, the site.

   There are several culverts which convey water under Lambert Lane and into the site's three washes: the Canada Hills Wash, the Lomas de Oro Wash, and the Canyon Shadows Wash. There are no man-made features onsite nor are there constructed facilities to convey water exiting the site.

3. Acreage of upstream off-site watersheds

   Preliminary hydrologic analysis suggests that there are three upstream offsite watersheds, which deliver a 100-year discharge to the subject property that are greater than 100 cfs. Please refer to the preliminary drainage analysis and exhibits prepared by JE Fuller Hydrology & Geomorphology, which is attached as an appendix to this site analysis.

4. Description of characteristics of onsite hydrology.

   Please refer to *Exhibit G: On-site Hydrology*.

   a. Approximate 100-year floodplains with discharges greater than, or equal to 50 c.f.s.

      Please refer to *Exhibit G*: On-Site hydrology for an illustration of the estimated 100-year floodplain limits with a discharge greater than 50 cfs.

   b. Areas of sheet flooding and average depths.

      There is no sheet flooding onsite.

   c. Federally mapped floodways and floodplains.

      Per the FEMA Flood Insurance Rate Map (FIRM), Panel 04019C1070L, Revised June 16, 2011, the site is designated as Zone 'A' in and around the three significant washes, and Zone 'X' throughout the remainder of the site.

d. 100-year peak discharges exceeding 50 cfs.

The estimated 100-year peak discharges exceeding 50 cfs. are shown on *Exhibit G: On-site Hydrology.*

5. A qualitative description of existing drainage conditions along the downstream property boundary.

All washes originating off-site cross under Lambert Lane via multiple culverts. The washes course through and exit the subject property in a natural condition and manner. To the south of the site, water flowing through the Lomas de Oro Wash is captured and conveyed in a rock gabion lined channel near the downstream property boundary. The wash eventually drains to the Cañada Del Oro Wash, located approximately one half mile south of the subject property.

Refer to the first appendix of this Site Analysis:
JE Fuller Hydrology & Geomorphology Report,
Dated May 2015

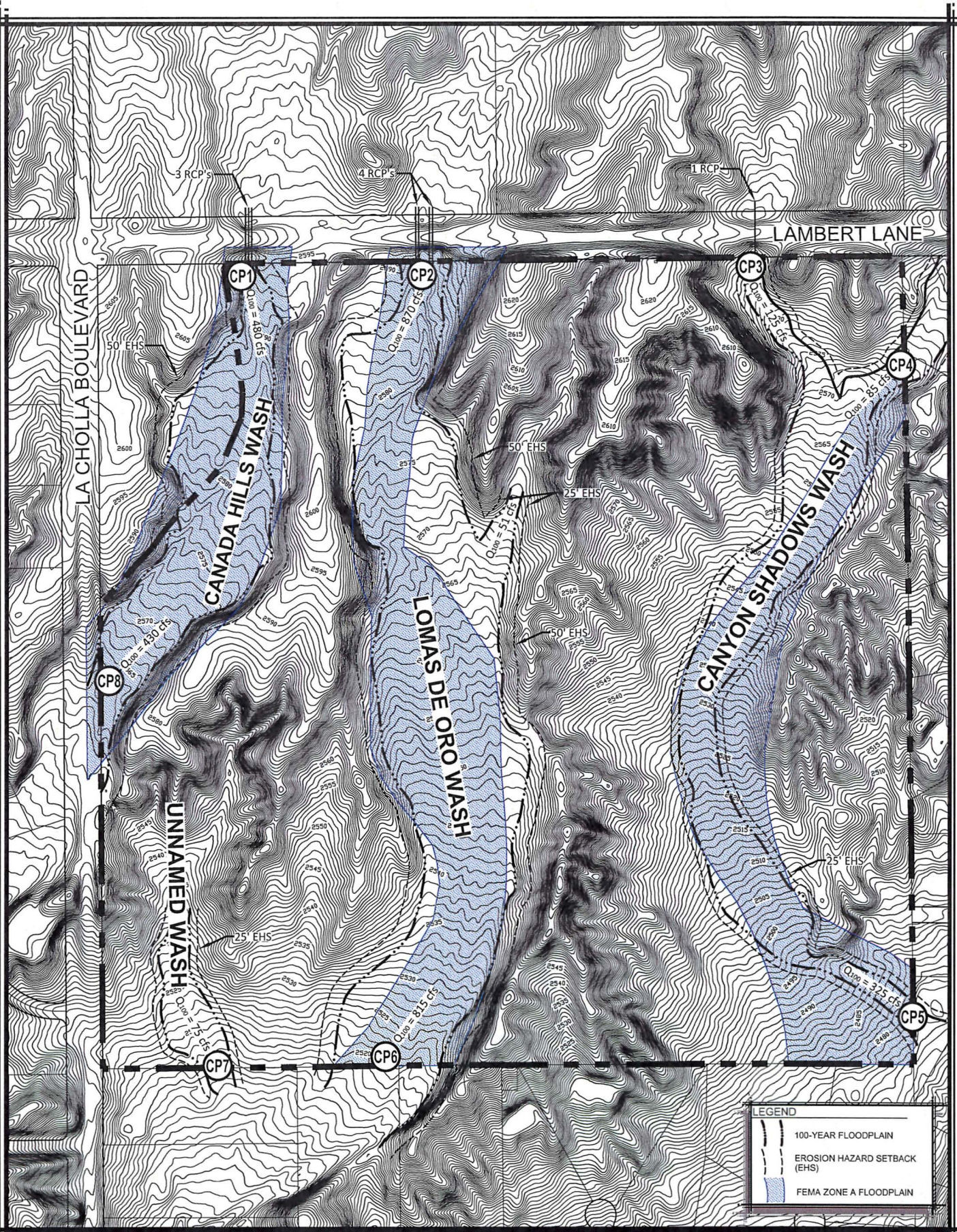
The WLB Group Inc. WLB

EXHIBIT F
OFF-SITE HYDROLOGY

2016.01.12
WLB No. 114012-A-001

0' 4000'

L:\114012\A-001 Rezoning\Exhibits\F - Off-Site Hydro.dwg Plotted: Jan. 13, 2016



The WLB Group **WLB**

EXHIBIT G
ON-SITE HYDROLOGY

2016.01.13
Contour Interval = 1 Ft.
WLB No. 114012-A-001

0' 400'

L:\114012\A-001 Rezoning\Exhibits\G - On-Site Hydro.dwg Plotted: Jan. 13, 2016

I-D. Vegetation

1. Vegetative communities and associations on the site.

   The dominant community of vegetation on the property is Sonoran-PaloVerde-Desert Cacti-Mixed Scrub Series. There are also smaller areas of Sonora-Mojave Creosote bush-White Bursage Desert Scrub and Apacherian-Chihuahuan Mesquite Upland Scrub. Typical species found in this biome include Bursage (*Ambrosia deltoidea*) and Foothills Palo Verde (*Cercidium microphyllum*). Wash and drainage areas are characterized by Mesquite (*Prosopis velutina*), Desert Hackberry (*Celtis Pallida*), and mixed scrub vegetation association.

2. Significant cacti and groups of trees and Federally-listed threatened or endangered species. Please refer to *Exhibit I: Arizona Game and Fish Department Letter.*

   There is no truly significant vegetation or distinctive native plant stands present on the site. The following plant species were found on the project site: Fishhook Barrel Cactus (*Ferocactus wislizenii*), Engelmann Prickly Pear (*O.p. var. discata*), Foothills Palo Verde (*Cercidium microphyllum*), Velvet Mesquite (*Prosopis velutina*), Creosote Bush (*Larrea tridentata*), Cat-claw Acacia (*Acacia greggii*), Desert Hackberry (*Celtis pallida*), Strawberry Hedgehog (*Echinocereus engelmannii*), Teddy Bear Cholla (*Opuntia bigelovii*), Jumping Cholla (*Opuntia fulgida*), Brittlebush (*Encelia farinose*), Desert Broom (*Baccharis sarathoides*), Fairy Duster (*Calliandra eriophylla*), Triangle Leaf Bursage (*Ambrosia deltoidea*), and Saguaro (*Carnegiea gigantea*). More dense and diverse vegetation occurs along the washes crossing the subject property.

   According to the Arizona Game and Fish Department, the following species are known to occur in the vicinity of the project site – Pima Indian Mallow (*Abutilon parishii*), designated as Sensitive and Salvage Restriced and Trelease Agave (*Agave schottii treleasei*), designated as Sensitive and Highly Safeguarded.

3. Vegetative densities by approximate percentage of plant cover.

   As determined by field reconnaissance and analysis of aerial photographs, the subject property is characterized by a moderate amount of vegetation. Several washes traverse the site from north to south. In some areas, the wash contains small stands of mature vegetation. The density of the vegetation generally diminishes as the distance from the washes increases. Please refer to *Exhibit H: Vegetation.*

The WLB Group WLB

EXHIBIT H
VEGETATION

2015.03.05
WLB No. 114012-A-001

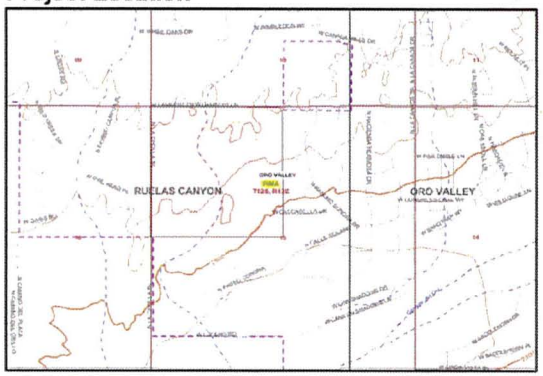
0' 400'

L:\114012\A-001 Rezoning\Exhibits\H - Vegetation.dwg Plotted: Mar. 05, 2015

Exhibit I: Arizona Game and Fish Department Letter:

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

Project Location



Project Name: Lambert & La Cholla
Submitted By: Gregory McDowell
On behalf of: PINAL
Project Search ID: 20140626023806
Date: 6/26/2014 4:56:06 PM
Project Category: Development Within Municipalities (Urban Growth),Residential subdivision and associated infrastructure,New construction
Project Coordinates (UTM Zone 12-NAD 83): 499190.200, 3583852.697 meter
Project Area: 157.994 acres
Project Perimeter: 3189.591 meter
County: PIMA
USGS 7.5 Minute Quadrangle ID: 1683
Quadrangle Name: RUELAS CANYON
Project locality is not anticipated to change

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl	SC	S	S	WSC
Gopherus morafkai	Sonoran Desert Tortoise	C*	S		WSC
Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	LE			WSC
Tumamoca macdougalii	Tumamoc Globeberry		S	S	SR

Page 1 of 7 APPLICATION INITIALS: _____

Exhibit I: Arizona Game and Fish Department Letter (Continued):

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

Page 2 of 7 APPLICATION INITIALS: _____

Exhibit I: Arizona Game and Fish Department Letter (Continued):

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Development Within Municipalities (Urban Growth),Residential subdivision and associated infrastructure,New construction

Project Type Recommendations:

All degraded and disturbed lands should be restored to their natural state. Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered; coordination with Arizona Department of Water Resources may be required (http://www.water.az.gov/adwr/)

Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required http://azstateparks.com/SHPO/index.html

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required (http://www.spl.usace.army.mil/regulatory/phonedir.html)

Communities can actively support the sustainability and mobility of wildlife by incorporating wildlife planning into their regional/comprehensive plans, their regional transportation plans, and their open space/conservation land system programs. An effective approach to wildlife planning begins with the identification of the wildlife resources in need of protection, an assessment of important habitat blocks and connective corridors, and the incorporation of these critical wildlife components into the community plans and programs. Community planners should identify open spaces and habitat blocks that can be maintained in their area, and the necessary connections between those blocks to be preserved or protected. Community planners should also work with State and local transportation planning entities, and planners from other communities, to foster coordination and cooperation in developing compatible development plans to ensure wildlife habitat connectivity. The Department's guidelines for incorporating wildlife considerations into community planning and developments can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

Development plans should provide for open natural space for wildlife movement, while also minimizing the potential for wildlife-human interactions through design features. Please contact Project Evaluation Program for more information on living with urban wildlife.

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants,

Exhibit I: Arizona Game and Fish Department Letter (Continued):

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

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Page 3 of 7 APPLICATION INITIALS: _____

Exhibit I: Arizona Game and Fish Department Letter (Continued):

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly.

The construction or maintenance of water developments should include: incorporation of aspects of the natural environment and the visual resources, maintaining the water for a variety of species, water surface area (e.g. bats require a greater area due to in-flight drinking), accessibility, year-round availability, minimizing potential for water quality problems, frequency of flushing, shading of natural features, regular clean-up of debris, escape ramps, minimizing obstacles, and minimizing accumulation of silt and mud.

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches.

Project Location and/or Species recommendations:

Heritage Data Management System records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:
Ecological Services Office
US Fish and Wildlife Service
2321 W. Royal Palm Rd.
Phoenix, AZ 85021-4951
Phone: 602-242-0210
Fax: 602-242-2513

Heritage Data Management System records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area (refer to page 1 of the receipt). Please contact:
Arizona Department of Agriculture
1688 W Adams
Phoenix, AZ 85007
Phone: 602-542-4373

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**

Page 5 of 7 APPLICATION INITIALS: _____

Exhibit I: Arizona Game and Fish Department Letter (Continued):

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

Terms of Use

By using this site, you acknowledge that you have read and understand the terms of use. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature:_____

Page 6 of 7 APPLICATION INITIALS: _____

Exhibit I: Arizona Game and Fish Department Letter (Continued):

Arizona's On-line Environmental Review Tool
Search ID: 20140626023806
Project Name: Lambert & La Cholla
Date: 6/26/2014 4:56:12 PM

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Page 7 of 7 APPLICATION INITIALS: _____

I-F. Viewsheds

1. Views onto and across the site from adjacent properties that may be blocked by development of the site. Please refer to *Exhibit J: Viewsheds and Exhibit K: Site Visibility.*

   The Tortolita Mountains to the northwest are slightly visible from the subject property. The Santa Catalina Mountains, including Pusch Ridge, to the east and southeast are highly visible from the subject property. The site's elevation falls not only from north to south, but also west to east. As such, views of the Santa Catalina Mountains from neighboring properties will not be impacted by the proposed development. There are no views or vistas from areas beyond adjacent properties that will be noticeably affected by the development of the site.

2. Areas of high visibility from adjacent off-site locations.

   The undulating character of the site causes large portions of the property to not be highly visible from surrounding roadways. The most developable portions of the property are visible primarily from the south. Views onto the site from the north, east, and west are largely screened by existing topography and rolling topography. The areas of high, medium, and low visibility were determined by field observation, topography, and aerial photograph reconnaissance. Please refer to *Exhibit K: Site Visibility*.

3. Provide photographs that depict proposed structures superimposed on existing landscape.

   The proposed development will consist of a residential component, integrated in a well-designed manner to fit with the existing nature of the site. However, at this time, a developer for this property has not been selected and the specific design and nature of the structures has not yet been determined.

The WLB Group WLB

EXHIBIT J
VIEWSHED KEYMAP

2015.03.06
WLB No. 114012-A-001

0' 400'

L:\114012\A-001 Rezoning\Exhibits\J - Viewshed Keymap.dwg Plotted: Dec. 04, 2015

①

②

③

The WLB Group Inc. WLB

EXHIBIT J
VIEWSHED 1

2014.08.26
Photo Date = 2014
WLB No. 114012-A-001

L:\114012\A-001 Rezoning\Exhibits\J - Viewshed 1.dwg Plotted: Oct. 06, 2014

④

⑤

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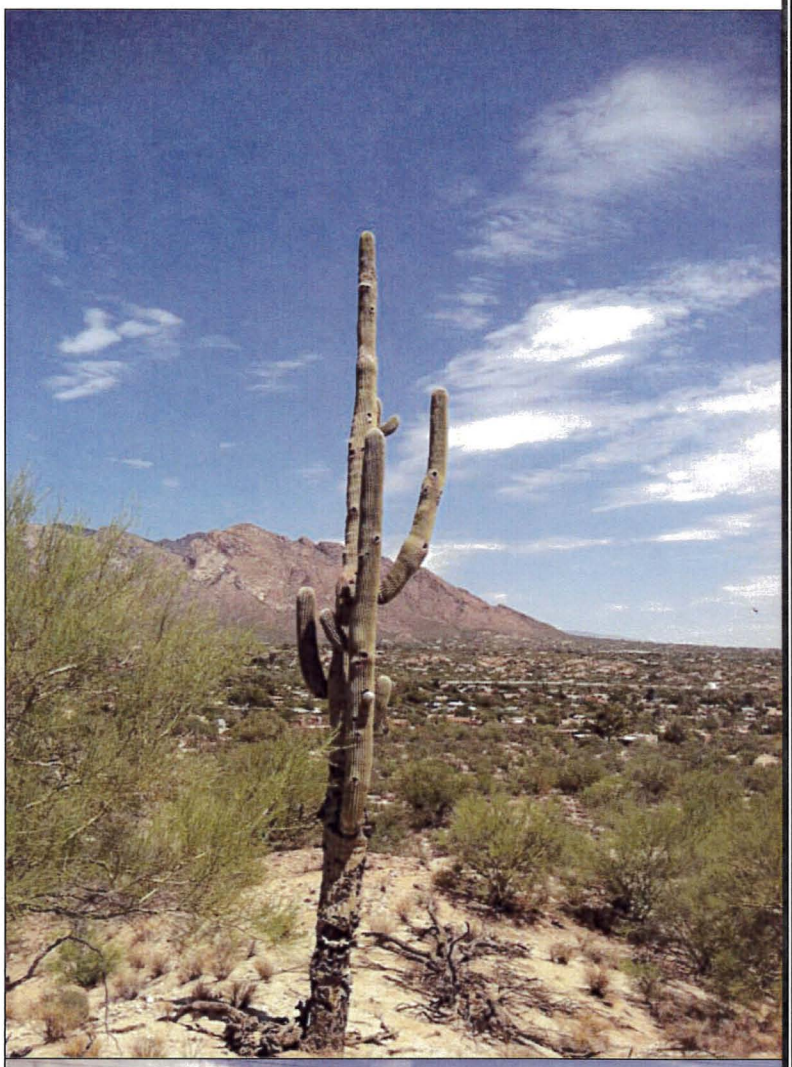
The WLB Group™ WLB

EXHIBIT J
VIEWSHED 2

2014.08.26
Photo Date = 2014
WLB No. 114012-A-001

L:\114012\A-001 Rezoning\Exhibits\J - Viewshed 2.dwg Plotted: Oct. 06, 2014

⑦



⑧

The WLB Group WLB

EXHIBIT J
VIEWSHED 3

2014.08.26
Photo Date = 2014
WLB No. 114012-A-001

L:\114012\A-001 Rezoning\Exhibits\J - Viewshed 3.dwg Plotted: Oct. 06, 2014

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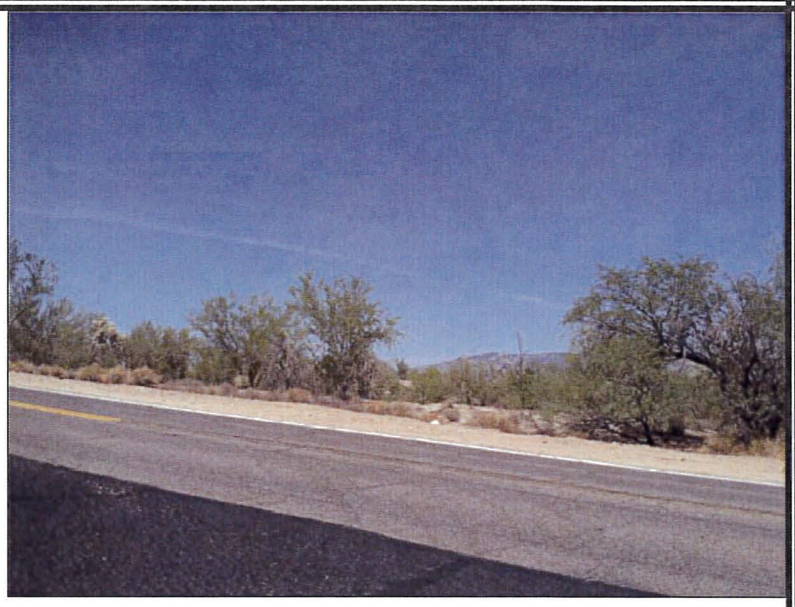


The WLB Group WLB

EXHIBIT J
VIEWSHED 4

2014.08.26
Photo Date = 2014
WLB No. 114012-A-001

L:\114012\A-001 Rezoning\Exhibits\J - Viewshed 4.dwg Plotted: Oct. 06, 2014

The WLB Group WLB

EXHIBIT K
SITE VISIBILITY

2015.03.09
WLB No. 114012-A-001

0' 400'

L:\114012\A-001 Rezoning\Exhibits\K - Site Visibility.dwg Plotted: Mar. 09, 2015

I-G. Traffic

1. All existing and proposed off-site streets between the development and the nearest arterial streets. Please refer to *Exhibit L: Traffic*

   Access to the subject property will be from La Cholla Boulevard and Lambert Lane. Major streets within one-mile of the subject property include; La Cholla Boulevard, Shannon Road, Lambert Lane, and La Canada Drive. Roads adjacent to and within one-mile distance from the subject property are generally in excellent condition.

2. All arterial streets within one mile of the project site:

Road	Section	Existing ROW	Ultimate ROW	Travel Lanes	Capacity	Speed Limit (mph)	ADT (PAG)	Surface Conditions	Scheduled Improvements
La Cholla Boulevard	Overton Rd. to Lambert Ln.	50' to 170'	150'	2	15,000	45	5,600	Minor cracking	Widening roadway to 4 lanes.
	Lambert Ln. to Naranja Dr.	50' to 70'	150'	2	15,000	45	7,400	Generally acceptable	Widening roadway to 4 lanes.
Lambert Lane	Shannon Rd. to La Cholla Blvd.	150'	150'	2	15,000	45	6,000	Generally acceptable	None identified.
	La Cholla Blvd. to La Canada Dr.	150'	150'	2	15,000	45	8,700	Generally acceptable	Widening roadway to 4 lanes w/ bike lanes.
La Canada Drive	Overton Rd. to Lambert Ln.	150'	150'	4	30,000	45	21,300	Generally acceptable	None identified.
	Lambert Ln. to Naranja Dr.	150'	150'	4	30,000	45	21,100	Generally acceptable	Overlay existing pavement.
Shannon Road	Overton Rd. to Lambert Ln.	70 to 150'	90'	2	15,000	45	4,600	Minor cracking	None identified.
	Lambert Ln. to Naranja Dr.	150'	90'	2	15,000	45	3,200	Minor cracking	None identified.

3. Existing and proposed intersections on arterials within one mile of the site, most likely to be used by traffic from this site

   Arterial intersections within one mile of the site that will likely carry traffic generated by this development include: La Cholla Boulevard at Lambert Lane, La Canada Drive at Lambert Lane, and La Cholla Boulevard at Overton Road. All of the arterial intersections listed above use traffic control signals. Please refer to *Exhibit L: Traffic*.

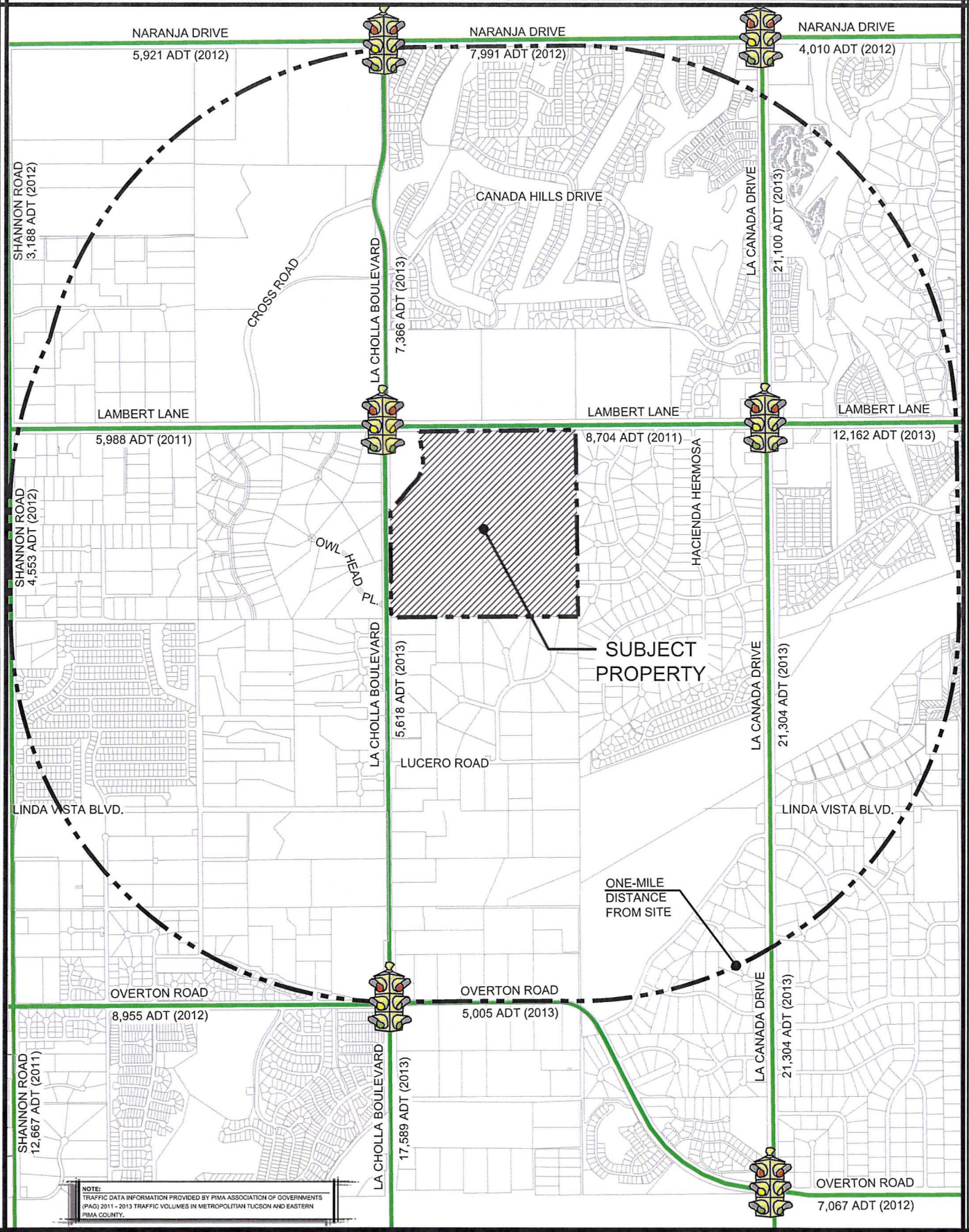
4. Existing bicycle and pedestrian ways adjacent to the site and their connections with streets, parks, and schools.

Please refer to *Exhibit M: Bike Routes*.

According to the Oro Valley Bikeways Map Existing Routes and Surfaces (2013), below are the bicycle facilities near the subject property, which are classified as follows:

- North of Lambert Lane, along La Cholla Boulevard (signed bike route w/ on-street bike lane).
- La Canada Drive (paved shared use path and signed bike route w/ on-street bike lane).
- Lambert Lane (shared use path).
- Canada del Oro Linear Park (paved shared-use path).
- Canada Hills Drive (paved shoulder)

The upcoming widening of La Cholla Blvd. will include bicycle and pedestrian paths.



The WLB Group Inc. **WLB**

EXHIBIT L
TRAFFIC

2014.09.19
WLB No. 114012-A-001

1/3 MILE

L:\114012\A-001 Rezoning\Exhibits\L - Traffic.dwg Plotted: Oct. 06, 2014

I-H. Recreation and Trails

1. Trails, parks and recreation areas within one mile of site

West Lambert Lane Park is northeast of the project site. The park includes a trail head and an approximately 1/3-mile looping trail.

The Eastern Pima County Trail System Master Plan shows single track trail #161 traversing the western side of the subject property from north to south; ultimately connecting to RP #002 (Cañada del Oro Wash) approximately ¼ mile south of the subject property. The trail continues north, merging with others and ultimately providing access to Tortolita Mountain Park.

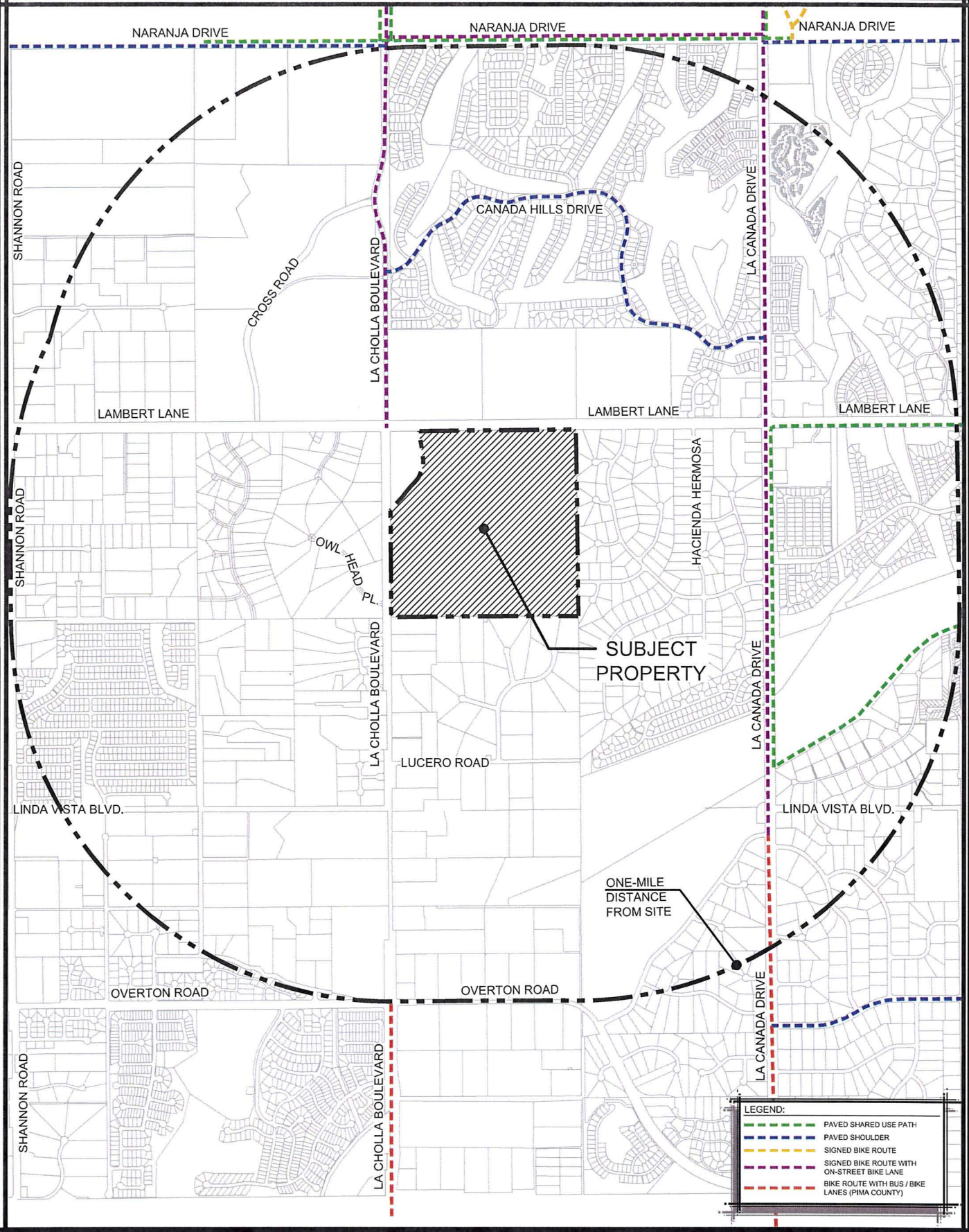
Refer to *Exhibit M: Bike Routes* and *Exhibit O: Schools, Recreation & Trails.*

2. Size and type of the parks and recreation areas identified.

The West Lambert Lane Park is roughly 38 acres. The park includes an approximately 1/3-mile looping trail with a decomposed granite surface. Paved access and parking is located off of Lambert Lane.

The Tortolita Mountain State Park consists of approximately 3,100 acres of open space. This park features passive recreational areas with numerous trails for hiking, biking and equestrian use

The Cañada Del Oro Riverfront Park consists of approximately 30 acres of active and passive recreational areas, ball fields, walking paths, and restroom facilities.



The WLB Group Inc. **WLB**

EXHIBIT M
BICYCLE ROUTES

2014.09.18
WLB No. 114012-A-001

1/3 MILE

L:\114012\A-001 Rezoning\Exhibits\M - Bike Routes.dwg Plotted: Oct. 06, 2014

I-I. Cultural/Archaeological/Historic Resources

1. Please refer to *Exhibit N: Arizona State Museum Letter* on the following two pages.

   a. Determine whether the site has been field surveyed for cultural resources.

      The subject property has been field surveyed for cultural resources. Tierra Archaeological Report No. 2015-012, dated March 12, 2014, was completed by Tierra Right of Way Land Services and submitted to the Town for review along with this Site Analysis.

      The report summarizes that two (2) historic isolated occurrences were recorded within the site boundaries, and neither of the isolated occurrences meet the criteria of significance for inclusion on the National Register of Historic Places (NHRP). The report recommends that the proposed development will have no impact and the project be allowed to proceed without further archaeological work required.

      Also see *Exhibit N: Arizona State Museum Records Check Letter*. According to the letter, thirty-five archaeological inspections were completed within one mile of the proposed project between 1976 and 2011.

   b. Identify any previously recorded archaeological or historic resources known to exist on the property.

      According to the Arizona State Museum, no historic sites are known to exist on the subject property but three are recorded within one mile of the site, including a transmission line and prehistoric site.

   c. State the probability that buried archaeological resources not visible from the surface would be discovered on the site

      A cultural resources survey was conducted. Tierra Archaeological Report No. 2015-012, dated March 12, 2014, concludes that neither of the isolated occurrences meet the criteria of significance for inclusion on the NRHP. The reports recommendation implies that the probability that the presence of buried archaeological resources is very small and unlikely. In accordance with Section 41-865 of the Arizona Revised Statutes, if remains are encountered during ground-disturbing activities, all ground-disturbing activities will cease until so directed by ASM personnel.

      A treatment plan is not recommended for the subject property.

I-I. Cultural/Archaeological/Historic Resources (Continued)

Exhibit N: Arizona State Museum Records Check Letter:

THE UNIVERSITY OF ARIZONA.

Arizona State Museum

P.O. Box 210026
Tucson, AZ 85721-0026
Tel: (520) 621-6302
Fax: (520) 621-2976

PIMA COUNTY ARCHAEOLOGICAL SITE RECORDS SEARCH *RESULTS*

E-mail **Request Received:** 5/12/2014 **Search Completed:** 6/16/2014

Requester Name and Title: Gregory McDowell, Land Planner
Company: The WLB Group, Inc.
Address: 4444 E. Broadway Boulevard
City, State, Zip Code: Tucson, Arizona 85711-3508
Phone/Fax/or E-mail: 881.7480

Project Name and/or Number
Parcel 224-39-0020

Project Description
Planned area development on ~ 155 acres

Project Area Location: SEC of Lambert Ln & La Cholla Blvd, Town of Oro Valley, Pima County, Arizona.

Legal Description: a portion of NW, S15, T12S, R13E, G&SR B&M, Town of Oro Valley, Pima Co., AZ.

Search Results: A search of the archaeological site files retained at the Arizona State Museum (ASM) found that the proposed project area has not been inspected for historic properties. No historic properties are recorded in the project area; three historic properties are recorded within a mile radius, including a transmission line and a prehistoric site. Thirty-five archaeological inspections were completed between 1976 and 2011 within a mile of the project area. A color orthophotograph taken in 2012 depicts an undeveloped parcel covered with native vegetation; several dirt trails criss cross the property as well as a couple of intermittent drainages. Residential development and undeveloped land are adjacent to the project area.

Sites in Project Area: Unknown; without an inspection of the ground surface in the proposed project area, it is impossible to ascertain the presence or absence of historic properties.

Recommendations: Because the subject parcel has not been inspected for cultural resources and because significant cultural resources are recorded in the region, the ASM recommends that the parcel be inspected by a qualified archaeological professional in advance of any ground-disturbing construction. A professional archaeological contractor will conduct a thorough pedestrian inspection of the ground surface in the area of the proposed development, looking for evidence of significant historic or prehistoric remains, and will provide you with a report of the results of the inspection. The report will also contain the archaeological contractor's recommendations for additional archaeological work, if any, that may be needed in the project area. A list of qualified archaeological contractors is maintained on the ASM website posted at the following address: http://www.statemuseum.arizona.edu/crservices/permits/index.shtml.

Pursuant to *Arizona Revised Statutes* §41-865 et seq., if any human remains or funerary objects are discovered during the project work, all effort will stop within the area of the remains and Dr. Todd Pitezel, ASM assistant curator of archaeology, will be contacted immediately at (520) 621-4795.

If I can be of further assistance, please contact me at the letterhead address or the phone number or e-mail address as follows.

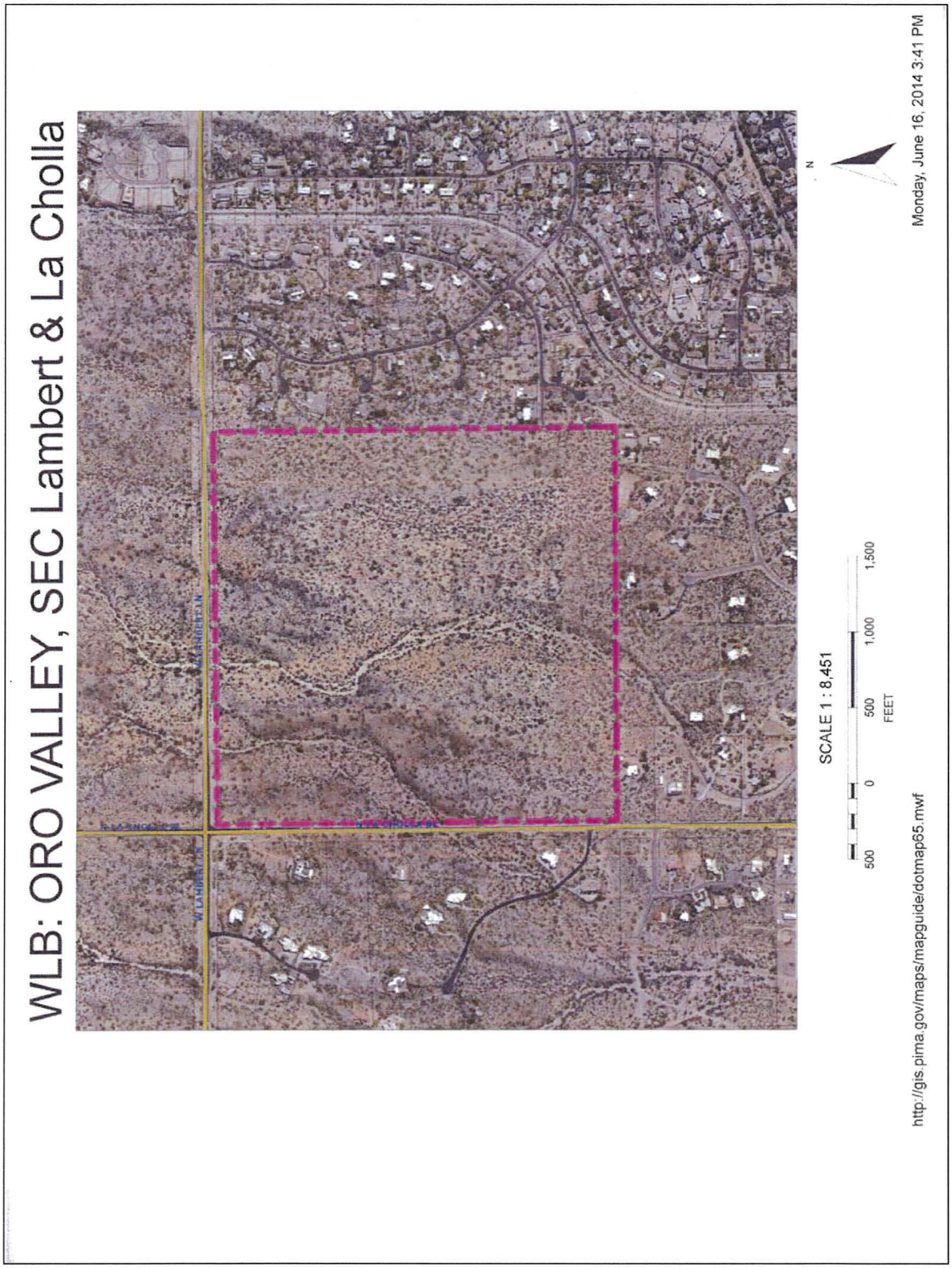
Sincerely,

Nancy E. Pearson

Nancy E. Pearson
Assistant Permits Administrator
(520) 621-2096
nepearso@email.arizona.edu

I-I. <u>Cultural/Archaeological/Historic Resources</u> (Continued)

Exhibit N: Arizona State Museum Records Check Letter (Continued):



I-J. Schools

Students within this development will be served by schools in the Amphitheater Unified School District or by one of the several charter or private schools within the area. There are two schools within one mile of the proposed development: Ironwood Ridge High School, approximately one mile to the northwest; and Casas Christian School, approximately one-half mile to the northwest. Please refer to *Exhibit O: Schools, Recreation & Trails.*

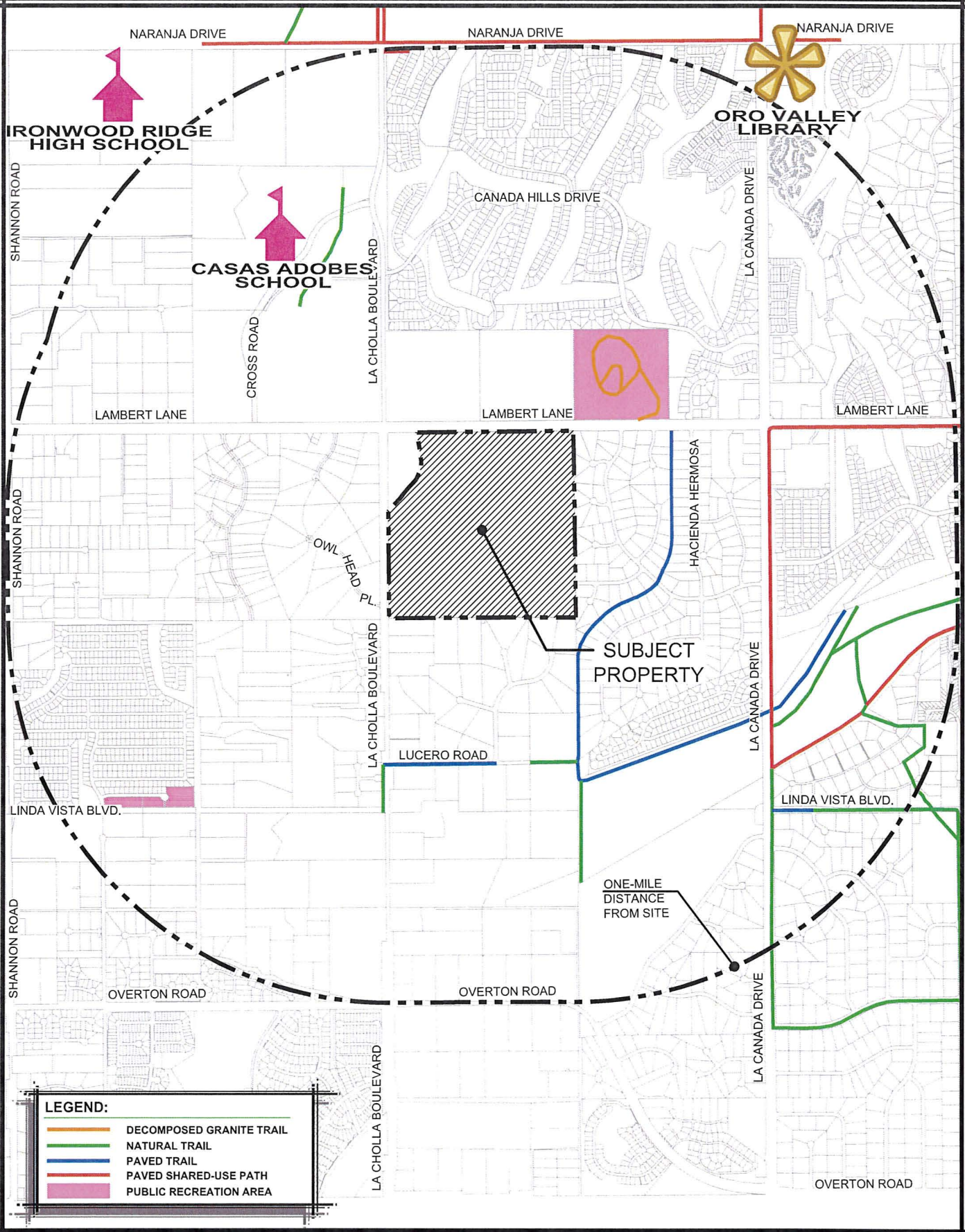
I-K. Water

1. Contact information: Mark Moore, Oro Valley Water Utility located at 11000 N. La Cañada Drive, Oro Valley, AZ 85737.

2. The subject property will be served by the Oro Valley Water Utility. The nature of offsite improvements will be determined during the platting process.

I-L. Sewers

Manhole 8904-28 is a part of an 8" sewer line, S-508-006, that runs southeast through the Rancho Feliz subdivision. Pima County Regional Wastewater Reclamation Department (PCRWRD) has issued a Type I Sewerage Capacity Investigation letter, verifying that capacity is available to publicly serve the proposed development at manhole 8904-28. Verbal discussions with PCRWRD indicate that capacity is also available at manholes to the south along La Cholla Blvd., which may provide additional connection opportunities. *Refer to Exhibit P: Sewers,* for a map of existing sewer alignments.



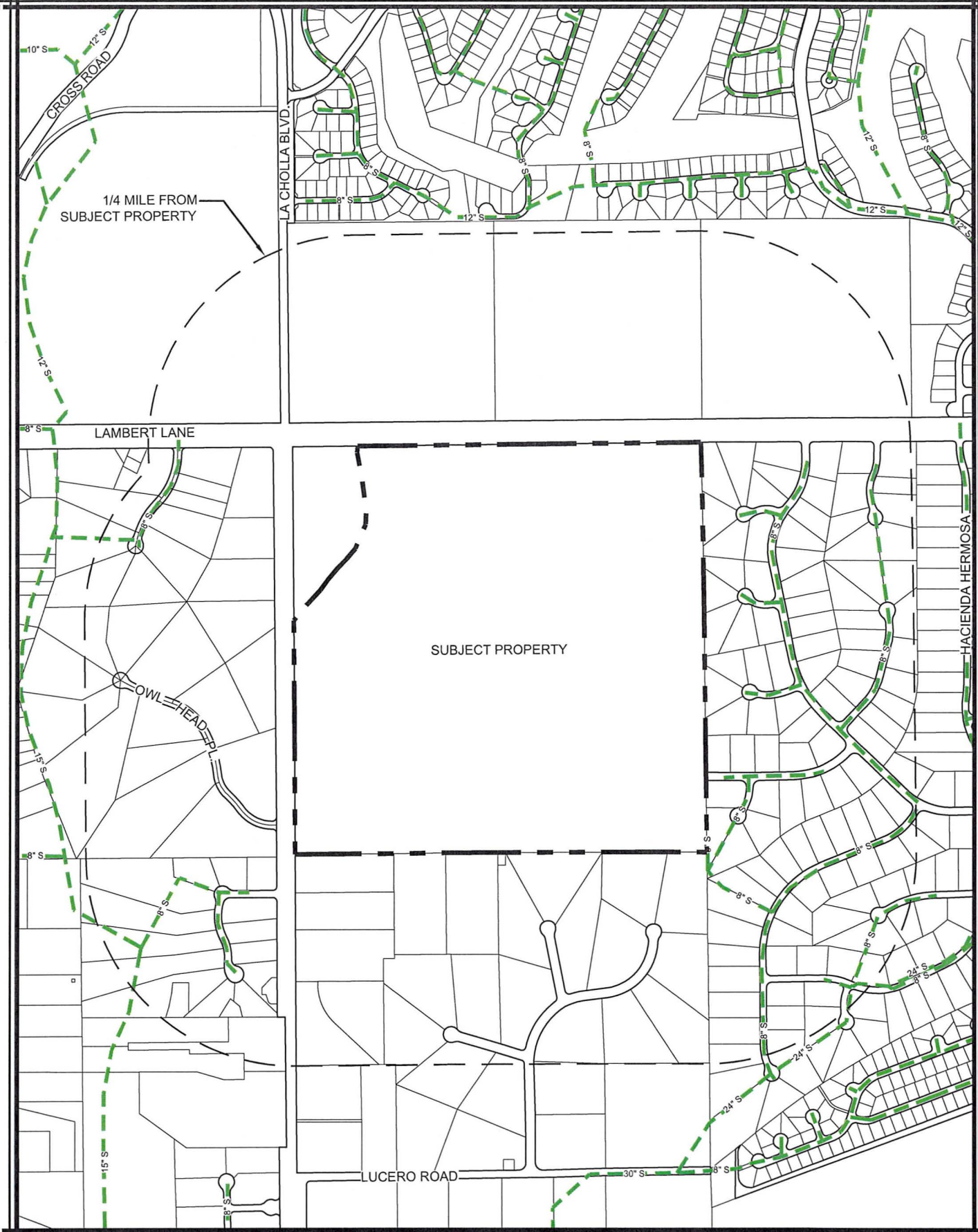
The WLB Group WLB

EXHIBIT O
SCHOOLS, TRAILS, AND RECREATION AREAS

2014.09.18
WLB No. 114012-A-001

1/3 MILE

L:\114012\A-001 Rezoning\Exhibits\O - Schools Trails and Rec.dwg Plotted: Oct. 06, 2014



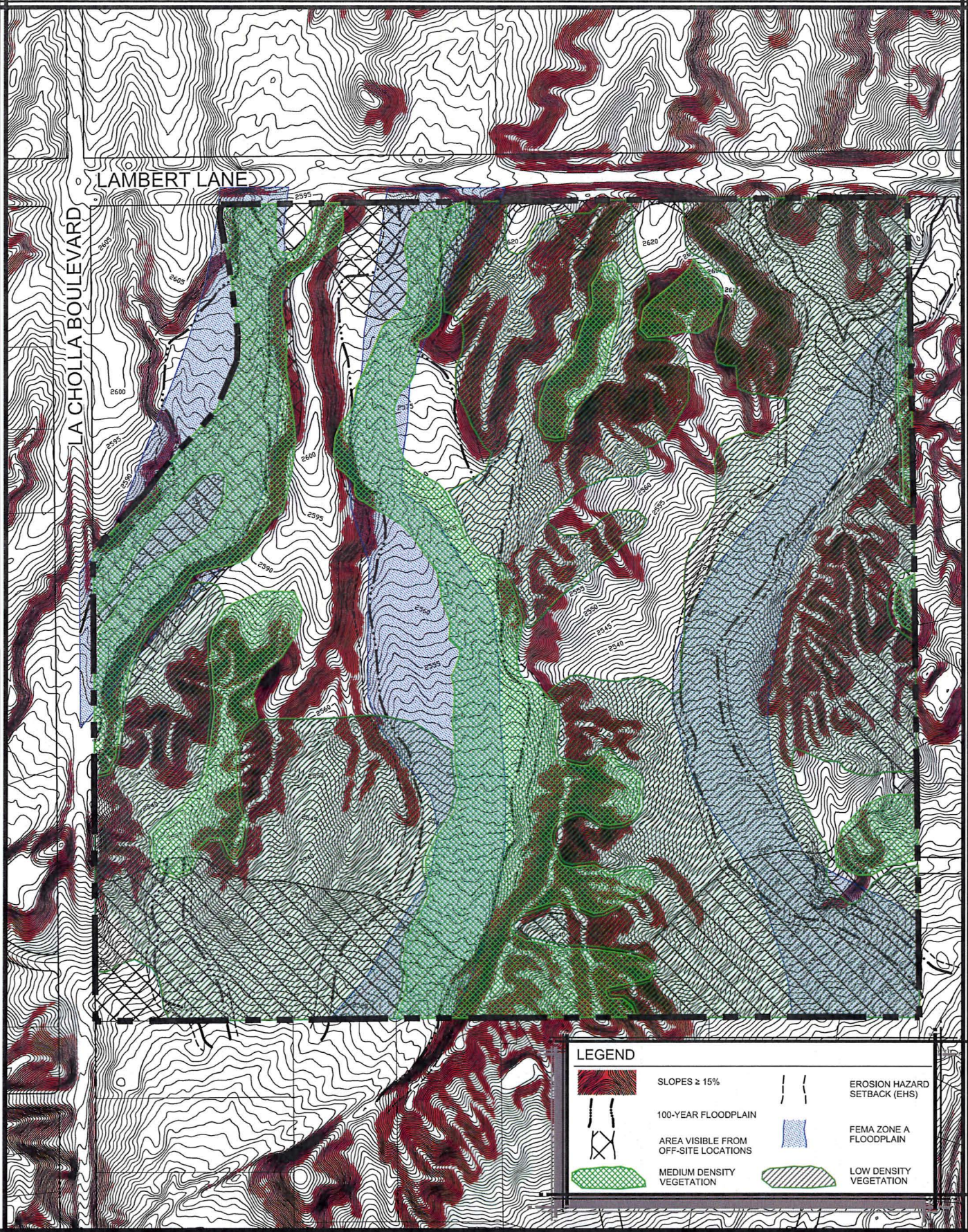
The WLB Group Inc. **WLB**

EXHIBIT P
SEWERS

2014.07.30
WLB No. 114012-A-001

0' 800'

L:\114012\A-001 Rezoning\Exhibits\P - Sewers.dwg Plotted: Oct. 06, 2014



The WLB Group Inc. **WLB**

EXHIBIT Q
McHARG COMPOSITE MAP

2014.09.22
Contour Interval = 1 Ft.
WLB No. 114012-A-001

0' 400'

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PART II – LAND USE PROPOSAL

PROJECT OVERVIEW

The proposal is to rezone a 142± acre parcel of land for the future development of a cluster-oriented and environmentally sensitive neighborhood consisting of 91 single-family homes. The lots are proposed to be a minimum of 10,000 square feet in size, but with most lots being at least one-half acre each. The neighborhood has been designed to blend with the natural constraints of the site. A minimum 150-foot buffer is provided along the southern and eastern boundaries of the site. Due to the environmental constraints, many of the homes proposed along the eastern boundary of the project will be constructed in excess of 600 feet from that property line.

As previously stated, the 2005 Town of Oro Valley General Plan designation for the site is Low Density Residential (LDR-1). LDR-1 allows for a range of 0.4-1.2 dwelling units per acre. We are proposing to rezone the site from R1-144 to R1-43. This proposed development is within the density range allowed under the existing LDR-1 General Plan designation.

The Tentative Development Plan (TDP) is consistent with the requirements of the Conservation Subdivision Design section of the ESLO (27.10.D.f.2.d.ii) by proposing the following:

- A development arranged in a manner that conserves the identified resources, such as riparian habitat and significant slopes/hillsides, with minimal disturbance;
- A lot layout that has been consolidated to a greater extent than what is perceived under Section 23.4, Table of Dimensional Requirements, through the use of the Flexible Development provisions available as a result of the substantial conservation of the site through open space;
- Almost 80% of the proposed lots adjoin open space areas; and,
- An emphasis on preserving the riparian corridors to promote viable wildlife use and movement.

As part of this rezoning application, the subject property seeks to utilize some of the Flexible Development provisions available as part of the sites participation in the Environmentally Sensitive Lands Ordinance (ESLO)(Section 27.10.F.2.c).

ESL Incentives Request:

	ZONING INCENTIVES (SECTION 27.10(F)(2)(C)(III)
✓	(a) Building Setbacks
--	(b) Landscape Buffer Yards
✓	(c) Minimum Lot Size
--	(d) Off-street Parking
✓	(e) Building Height
--	(f) Open Space
--	(g) Mixed Use
✓	(h) Modified Review Process
✓	(i) Recreation Area Credit
✓	(j) Native Vegetation Preservation

Section 27.10(F)(2)(b) – Applicability:

i. The following design options may be applied to property or portions of property when ESOS is applied to twenty-five (25%) or more of a project site, except as provided herein.

ESOS Total for site = ~71%

(a) Building Setbacks: Per Section 27.10(F)(2)(b) – Applicability, and the use of a Conservation Subdivision Design for a reduced minimum lot size of no less than 3,000 square feet, we request that the side setbacks be reduced to no less than five (5) feet, front setbacks be reduced to no less than ten (10) feet for the use of side entry garages, and the rear setbacks be reduced to twenty (20) feet – consistent with zoning districts with comparable lot sizes. This request will not result in an on-lot driveway length of less than twenty (20) feet. This request will allow for the residential subdivision to incorporate more diverse details and massing conditions, which will lead to a more attractive and varied streetscape. The reduced setbacks will allow for the maximization of continuous protected open space, as well as reduce the amount and improve the efficiency of necessary, critical infrastructure systems.

(c) Minimum Lot Size: Per Section 27.10(F)(2)(b) – Applicability, and Section 27.10(F)(2)(d)(iii)(c) – Lot Size Reduction, we request the ability to reduce the minimum lot size to no less than 10,000 square feet. The site contains ~71% ESOS, exceeding the 66% ESOS requirement. The reduction in lot size allows for the clustering of development, an instrumental element of the Conservation Subdivision Design. Lot Size Reduction allows for the maximization of continuous protected open space, as well as reduce the amount and improve the efficiency of necessary, critical infrastructure systems.

(e) Building Height: Per Section 27.10(F)(2)(b) – Applicability, we request the ability to raise the building height limit of 18 feet (per the R1-43 zoning), to 20 feet for single story single family residences, and 28 feet for two story single family residences. These height requests have been

demonstrated using representative story poles during a publicly posted neighborhood meeting on February 10, 2015. The increase in building height allows the future developer/builder to meet the current market demands of homebuyers wants and needs in terms of both living space and design, while adequately providing enough pitch for structural integrity and drainage. It is important to note that some of the lots have been restricted to single story homes based on feedback received from neighbors. These lots are noted as such on the TDP, refer to *Exhibit R: Tentative Development Plan*.

(h) Modified Review Process: Per Section 27.10(F)(2)(b) – Applicability, we request the use of the Modified Review Process for site plans and preliminary plats submitted in conformance with the approved Tentative Development Plan. The site contains ~71% ESOS, providing for minimal impact on neighboring developments and maximizing continuous protected open space.

(i) Native Vegetation Preservation: Per Section 27.10(F)(2)(b) – Applicability, we request the right to waive the requirements for native plant salvage and mitigation within the development envelope. The site contains ~71% ESOS, exceeding the 50% minimum requirement. The use of the modification will not be applied to areas of distinct vegetation or native plants that are considered threatened or endangered.

(j) Recreation Area Credit: Per Section 27.10(F)(2)(b) – Applicability, we request that the passive and/or active recreation amenities located within the ESOS resource management area be credited toward the residential recreation area requirements. The proposed recreation areas satisfy the locational requirements of Section 26.5, Provision Recreational Area, and connectivity between the recreation areas and open space has been maintained.

LEGEND

- Proposed Basin Location
- Proposed Trail w/ Seating Nodes (15' Easement)
- ESL Critical Resource Areas: Preservation Required 17.5± Ac. (95%)
  Preservation Provided 17.9± Ac. (97%)
- ESL Resource Management Area Tier 1: Preservation Required 81.4± Ac. (66%)
  Preservation Provided 82.5± Ac. (67%)
- Trailhead
- Proposed 100-Year Floodplain
- Existing Slopes Greater Than 25%
- 86' x 254' (Min. ½ Acre): 73 Lots
- 80' x 125' (Min. 10,000 SF.): 18 Lots
- Single Story Restricted Lots (20')

GENERAL NOTES

A. Property Size: 143.3± ac. (141.7± ac. net after ROW dedications).
B. Existing General Plan Land Use: Low Density 1 (≤1.2 Homes per Acre).
C. Zoning request: R1-144 to R1-43.
D. Gross Residential density: 1.7 Acres per Home.
E. Residential lots: 91 (Min. = 80' x 125', Typ. = ½ Acre).
E. Open Space / Common Area: 106.9± ac. (~75% of Site).
ESOS Provided: 100.4± ac. (~71% of Site).
F. The future HOA of this development will be responsible for the permanent protection of the ESOS on this site.
G. Lighting at the recreation area will be shielded to minimize impacts to the adjacent wash.
H. Water service provider: Oro Valley Water.
I. Corner lots will be restricted to single-story.
J. No more than 2 two-story homes shall be located side-by-side on the same street.
K. Oro Valley Trail #161 will be protected as a non-motorized public access trail easement.
L. ESLO Zoning Incentives (Section 27.10)
1. Building Setbacks:
Front = 10'; Side = 5'; R = 20'
2. Minimum Lot Size: 10,000 S.F.
3. Building Height: 20' (1-Story) & 28' (2-Story).
4. Modified Review Process
5. Recreation Area Credit
6. Native Vegetation Preservation

The WLB Group
TUCSON • PHOENIX • LAS VEGAS • FLAGSTAFF
520.881.7480 • tucson@wlbgroup.com

EXHIBIT R
TENTATIVE DEVELOPMENT PLAN

2016.03.18
Contour Interval = 5 Ft.
WLB No. 114012-A-001
N.T.S.

L:\114012A-001 Rezoning\Exhibits\R - TDP - 20160318.dwg Plotted: Mar. 18, 2016

INSERT POCKET for 24x36 Tentative Site Plan

E.S.O.S. CATEGORY	TOTAL AREA EXISTING (AC)	REQUIRED ESOS (AC)	PROVIDED ESOS (AC)
CRITICAL RESOURCE AREA	18.43±	17.51± (95.0%)	17.85± (96.9%)
RESOURCE MGMT. AREA 1*	123.32±	81.39± (66.0%)	81.41± (66.0%)
TOTALS (ESOS)	141.75±	98.90± (69.8%)	99.26± (70.0%)
ESOS BUFFER			

* REGIONAL DRAINAGE IMPROVEMENTS INCLUDED IN RESOURCE MANAGEMENT AREA 1 PER TOWN ZONING CODE SECTION 27.10.E.3.c AND 27.10.F.2.2.f.vi.

NOTE:

- THERE ARE NO MAJOR OR MINOR ROCK OUTCROPS, DISTINCTIVE NATIVE PLANT STANDS OR DISTINCTIVE NATIVE PLANTS WITHIN THE SITE BOUNDARY.
- THE FUTURE HOA OF THIS DEVELOPMENT WILL BE RESPONSIBLE FOR THE PERMANENT PROTECTION OF THE ESOS ON THIS SITE.

The WLB Group WLB

EXHIBIT S
E.S.O.S. MAP

WLB No. 114012-A-001

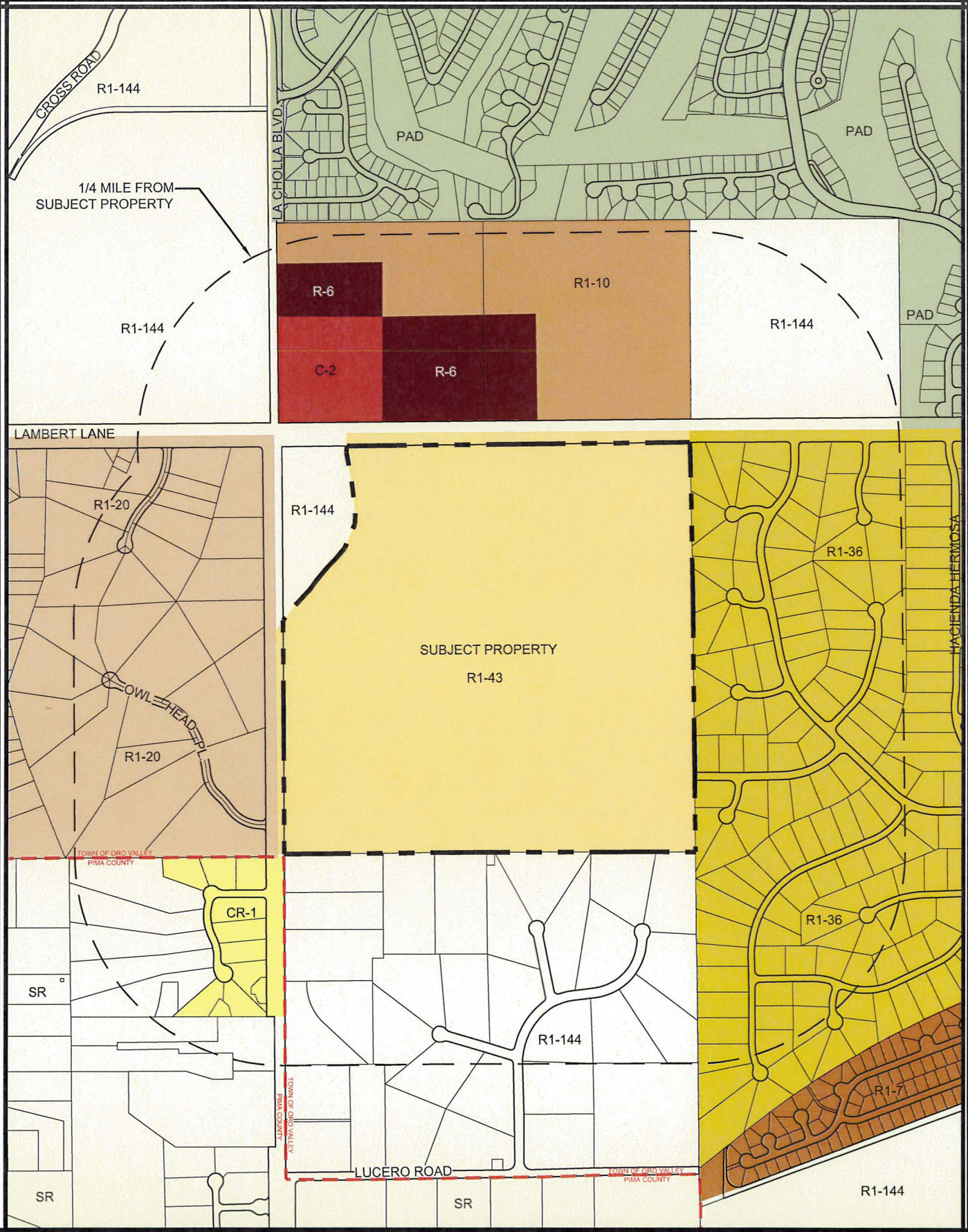
0' 500'

L:\114012\A-001 Rezoning\Exhibits\S - ESOS 20160318.dwg Plotted: Mar. 23, 2016

II-A. Land Uses

1. The proposed land use is a single family residential neighborhood designed to respect the physical constraints of the site. Refer to *Exhibit T: Proposed Zoning*.

2. The proposed development has no effect on existing onsite land uses since the land is currently vacant. The proposed neighborhood will be visible to a few of the surrounding properties. Visual impacts have been mitigated by providing a minimum of a 150-foot buffer along the southern and eastern boundaries. The development will be cluster oriented and have additional screening provided by the natural topography of the site. The new neighborhood streets will not connect to any of the surrounding subdivisions, and therefore will not cause any vehicular traffic increases to their respective local roads. A traffic study has been prepared, and the proposed neighborhood will provide the required mitigation measures to offset any impacts that may be imposed onto the surrounding roads.



The WLB Group Inc. **WLB**

EXHIBIT T
PROPOSED ZONING

2016.01.13
WLB No. 114012-A-001

0' 800'

L:\114012\A-001 Rezoning\Exhibits\T - Proposed Zoning.dwg Plotted: Jan. 13, 2016

II-B. Topography

The Tentative Development Plan (TDP) avoids extensive disturbance of washes and the major slopes found along their banks. Minor disturbance is proposed for roadway and utility crossings. Nearly 70% of the project area will remain as natural open space. The most significant slopes will largely remain within the undisturbed areas, with development clustered in areas of smoother topography. The proposed regional basin described below will require encroachment into a small hillside in the northern portion of the property that is minimally visible from nearby offsite areas.

II-C. Hydrology

The site layout will impact hydrologic characteristics such as impervious cover and floodplain encroachment. As a result of the increased impervious cover, detention basins will be constructed to detain the increased flows, and will feature outlet structures (weirs, culverts or catch basins) to discharge the basins as a metered flow rate no greater than existing conditions peak stormwater runoff rate except for the Lomas de Oro Wash, which will have its flows reduced as described below. Detention basins will be spread throughout the development so as to minimize their visual impact. Some of the more significant potential basin locations have been depicted on the Tentative Development Plan. Where roadway crossings are proposed, culverts or bridges will be employed to convey stormwater past the crossings.

The project will address not only onsite flows that will be produced by the increase in impervious surfaces, but also the flows entering the site from the north. The project will be designed to avoid negatively impacting upstream and downstream properties by including offsite drainage improvements necessary to control the existing flooding problems experienced by residents downstream of the project along the Canyon Shadows Wash. The project will also provide better management of local tributaries to the Lomas de Oro Wash, as described below. Maintenance of all drainage improvements proposed as part of this development will be the responsibility of the HOA, except for the largest regional offline basin, which will be the responsibility of the Town of Oro Valley.

In the eastern portion of the property where the Canyon Shadows Wash flows, offsite improvements will include a drainage channel that will connect to the existing channel located approximately 300 feet southeast of the project. This proposed channel will allow the developer to process a CLOMR and LOMR with FEMA to officially remove those three residences from the FEMA flood hazard zone.

In the western portion of the project where the Lomas de Oro Wash flows, several drainage improvements are proposed to improve the downstream flooding conditions that currently impact residential parcels south of the subject property. Most importantly, a large, regional basin will be installed in the northern portion of the property. The basin will be designed to reduce the 100-year peak flow by 10%, per request by the Town Engineer, and will be dedicated to the Town. The basin will have a maximum ponding depth of approximately five feet, which the Town Engineer has authorized in this case. In addition, the basin's size will require relief from the Code limitations on maximum cut depth. An in-line detention basin north of the proposed roadway crossing will also provide flow reduction. No FEMA applications will be filed

for the Lomas de Oro Wash. However, local regulated floodplains that currently impact the areas west of the Lomas de Oro will be detained within the development, and routed to the Lomas de Oro in a way that contributes to the overall reduction in peak flows leaving the project.

II-D. Vegetation

Vegetation within the three primary wash corridors onsite, as well as much of the vegetation in the northern and eastern portions of the site, will be preserved in its natural condition. Where development is proposed, native plants will be inventoried, and viable specimens will be transplanted per the Town's native plant preservation ordinance.

II-E. Wildlife

With the exception of required flood control protection, and road and utility crossings, the Environmentally Sensitive Lands Critical Resource Areas will remain undisturbed. The project will not restrict wildlife movement through the site. Additionally, no direct access to the washes will be allowed from individual back yards.

II-F. Buffer Plan

A minimum 150-foot wide open space buffer is proposed along the southern and eastern boundaries of the property where the project is adjacent to larger lot residential. The eastern side of the property is constrained by topography and wash area. The majority of the lots on the east side of the project will be located in excess of 600 feet from the adjacent neighborhood. From the site boundary one lot will be located approximately 40 feet from the Lambert Lane right-of-way and two lots will be located approximately 40 feet from the La Cholla Blvd. right-of-way. Landscape buffer yards will be installed per Town requirements. The purpose of these buffers is to provide a reasonable level of visual screening and setback between the development and adjacent neighbors. Supplemental landscaping and structural screening will be installed beyond the open space buffers as needed.

The WLB Group WLB

EXHIBIT U
PROPOSED GRADING

WLB No. 114012-A-001

0' 400'

L:\114012\A-001 Rezoning\Exhibits\U - Proposed Grading.dwg Plotted: Mar. 23, 2016

II-G. Viewsheds

The Tortolita Mountains to the northwest are slightly visible from the subject property. The Santa Catalina Mountains, including Pusch Ridge, to the east and southeast are highly visible from the subject property. Due to the undulating terrain, rolling hills, and generally lower elevation of this site (relative to neighboring properties), views of the mountains will be minimally impacted by the proposed development. There are no views or vistas from areas beyond adjacent properties that may be noticeably affected by the development of the site. The views from existing residential subdivisions surrounding the subject property will not be adversely affected by the proposed development.

II-H. Traffic

The project will be accessed from both Lambert Lane and La Cholla Boulevard. Both entrances will be gated. Improvements will be made as determined by a traffic report prepared during the Conceptual Site Plan review and approval process. The proposed private streets will follow the existing landform and will be constructed to the Town of Oro Valleys street standards. A preliminary Traffic Impact Analysis (TIA) has been performed by Southwest Traffic Engineering and submitted with this site analysis. In general, surrounding arterial intersections will continue to operate at an adequate level of service following the completion of the development. The TIA recommends that a southbound left turn lane be provided on La Cholla Boulevard for vehicles entering the project site at Owl Head Place; a westbound left turn lane be provided on Lambert Lane for vehicles entering the project site at the proposed northern driveway; and new stop signs installed for vehicles exiting the project site at both access intersections.

II-I. Recreation and Trails

The Eastern Pima County Trails Master Plan calls for a single track trail, #161 to traverse the site in a north-south direction. The development will provide an easement for this trail. Pedestrian connections will be placed throughout the open space and common areas. These paths will connect the wash areas running through the property and potentially to West Lambert Lane Park, located northeast of the site. Sidewalks will be located along all residential streets within the development and will provide pedestrian connections to the trails throughout the site via a series of trailheads as shown on the TDP.

II-J. Cultural/Archaeological/Historic Resources

1. Please refer to *Exhibit N: Arizona State Museum Records Check Letter.*

    a. Determine whether the site has been field surveyed for cultural resources.

        The subject property has been field surveyed for cultural resources. Tierra Archaeological Report No. 2015-012, dated March 12, 2014, was completed by Tierra Right of Way Land Services and submitted to the Town for review along with this Site Analysis.

The report summarizes that two (2) historic isolated occurrences were recorded within the site boundaries, and neither of the isolated occurrences meet the criteria of significance for inclusion on the National Register of Historic Places (NHRP). The report recommends that the proposed development will have no impact and the project be allowed to proceed without further archaeological work required.

See *Exhibit N: Arizona State Museum Records Check Letter*. According to the letter, thirty-five archaeological inspections were completed within one mile of the proposed project between 1976 and 2011.

b. Identify any previously recorded archaeological or historic resources known to exist on the property.

According to the Arizona State Museum, no historic sites are known to exist on the subject property but three are recorded within one mile of the site, including a transmission line and prehistoric site.

c. State the probability that buried archaeological resources not visible from the surface would be discovered on the site

A cultural resources survey was conducted. Tierra Archaeological Report No. 2015-012, dated March 12, 2014, concludes that neither of the isolated occurrences meet the criteria of significance for inclusion on the NRHP. The reports recommendation implies that the probability that the presence of buried archaeological resources is very small and unlikely. In accordance with Section 41-865 of the Arizona Revised Statutes, if remains are encountered during ground-disturbing activities, all ground-disturbing activities will cease until so directed by ASM personnel.

A treatment plan is not recommended for subject property.

II-K. Schools

The Amphitheater Unified School District uses a student generation factor of 0.2075 per home for elementary students, 0.2197 per home for middle school students and 0.1282 per home for high school students. This project's anticipated 91 homes would have an impact of 19 elementary students, 20 middle school students and 12 high school students. There is one school within mile radius of the proposed development. Casas Adobes School is located approximately ¼ mile to the northwest the project site. Ironwood Ridge High school is located just over one mile northwest of the project site.

II-L. Water

The subject property will be served by Oro Valley Water. Offsite infrastructure extensions will be necessary and will be built at the sole expense of the developer. The nature of offsite improvements will be determined during the platting process.

II-M. Sewers

Pima County Regional Wastewater Reclamation Department has issued the developer a Type I Sewerage Capacity Investigation letter, verifying that capacity is available to publicly serve the proposed development. The project will need to connect to the 8" sanitary sewer line S-508-006, at the SE corner of the site, at manhole 8904-28. Verbal discussions with PCRWRD indicate that capacity exists at manholes to the south of the project along La Cholla Blvd. We are currently determining if this route would be a better option for the project. *Refer to Exhibit V: Pima County Regional Wastewater Reclamation Dept. Capacity Response Letter.*

II-K. Schools (Continued)

Exhibit V: Amphitheater School District Capacity Response Letter:

AMPHITHEATER
Public Schools

OFFICE OF LEGAL COUNSEL
Todd A. Jaeger, J.D.
Associate to the Superintendent
(520) 696-5156
FAX (520) 696-5074

701 W. Wetmore Road • Tucson, AZ 85705 • (520) 696-5000 • TDD (520) 696-5055

GOVERNING BOARD MEMBERS Deanna M. Day, M.Ed. President · Jo Grant Vice President · Kent Paul Barrabee, Ph.D. · Julie Cozad, M.Ed. · Scott A. Leska

SUPERINTENDENT Patrick Nelson

April 3, 2015

Robert Kirschmann
Staff Planner
The WLB Group, Inc.
4444 E Broadway Blvd
Tucson AZ 85711-3508

RE: Proposed Development of approximately 154 single family homes on approximately 141 acres within the Amphitheater District South of Lambert Lane/East of La Cholla Boulevard

Dear Mr. Kirschmann:

I am responding to your request for information regarding the capacity of Amphitheater schools impacted by your proposed development.

Using 2000 demographic multipliers developed by the U.S. Department of Census, Bureau of Census, and adjusted for Amphitheater District's school organizational patterns, we project the following student populations to result from this project when built:

Academic Level	154 Single Family Homes
Elementary	32
Middle	34
High School	20

The census multipliers we use to obtain these projections are 0.2075 elementary students per household, 0.2197 middle school students per household and 0.1282 high school students per household.

The capacity noted below is based on school enrollment as of March 31, 2015. The schools which would be impacted by your project's proposed enrollment are listed below, along with the physical capacity available at each school *presently*. Please note that these schools will also be impacted by other developments in this area which may have already been approved by the Council but which are not yet built.

Amphitheater High • Canyon del Oro High • Ironwood Ridge High
Amphitheater Middle School • Coronado K-8 School • Cross Middle School • La Cima Middle School • Wilson K-8 School
Copper Creek Elementary • Donaldson Elementary • Harelson Elementary • Holaway Elementary • Keeling Elementary • Mesa Verde Elementary
Nash Elementary • Painted Sky Elementary • Prince Elementary • Rio Vista Elementary • Walker Elementary • Rillito Center • El Hogar

II-K. Schools (Continued)

Exhibit V: Amphitheater School District Capacity Response Letter:

School Name	School Capacity	Spaces Currently Available
Mesa Verde Elementary	700	330
Cross Middle	900	218
Canyon del Oro High	2500	881

If I can provide any additional information, please feel free to contact me.

Sincerely,

Connie R. McFarland
Legal Assistant to Todd A. Jaeger, J.D.

II-M. Sewers

Exhibit W: Pima County Regional Wastewater Reclamation Dept. Capacity Response Letter:

PIMA COUNTY

REGIONAL WASTEWATER RECLAMATION DEPARTMENT
201 NORTH STONE AVENUE
TUCSON, ARIZONA 85701-1207

JACKSON JENKINS
DIRECTOR

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

August 1, 2014

LINDA THOMPSON
THE WLB GROUP, INC.
4444 E BROADWAY
TUCSON, ARIZONA 85711

Sewerage Capacity Investigation No. 2014-167 Type I

RE: **Lambert and La Cholla SEC, Parcel 224390020**
Estimated Flow 23,328 gpd (ADWF).

Greetings:

The above referenced project is tributary to the Ina Road / Tres Rios Wastewater Reclamation Facility via the Canada Del Oro Interceptor.

Capacity is currently available for this project in the public sewer S-508-006, downstream from manhole 8904-28.

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

If further information is needed, please feel free to contact us at (520) 724-6642.

Reviewed by: Kurt Stemm CEA

APPENDICES

JE FULLER REPORT

OFFSITE DRAINAGE ANALYSIS FOR:
LA CHOLLA AND LAMBERT SEC

A PROPOSED SUBDIVISION LOCATED IN THE NORTHWEST 1/4 OF SECTION 15, T-12-S, R-13-E, G.&S.R.M., ORO VALLEY, ARIZONA

Prepared for:

Future Arizona Inc.
1555 N Astor Street
Chicago, IL 60610Contact:
Mr. Peter Fasseas

By:

JE Fuller Hydrology & Geomorphology Inc.
40 E Helen Street
Tucson, Arizona 85705
520-623-3112

May 2015

Registered Professional Engineer (Civil)
CERTIFICATE NO.
43845
IAN PATRICK
SHARP
DATE SIGNED 5/13/2015
ARIZONA, U.S.A.

Expires 3/31/2018

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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Appendix A. Exhibits
Appendix B. Existing Conditions FLO-2D Model

1 Introduction

1.1 Project Location and Description

JE Fuller has prepared this report for Future Arizona, Inc. and the WLB Group to assist them plans for a parcel of land located at the southeast corner of La Cholla Blvd. and Lambert Lane. This report addresses offsite drainage hydrology, presenting the results of a 100-year storm analysis with the FLO-2D model.

Figure 1 on Page 2 shows the project location. Figure 2 shows an overview of the watershed.

1.2 Scope of Work

Offsite drainage in the existing condition was defined using the FLO-2D program. The 100-year, 3-hour storm was modeled using standard procedures used on similar models throughout Pima County to determine the design discharges at the project boundary.

1.3 Overview of Existing Conditions and FLO-2D Analysis

Runoff drains into the project from the north, crossing Lambert Lane. The upstream watershed is relatively long (6.9 miles) and narrow (0.25-0.5 miles) and the flow paths transition from tributary flow patterns in the upper piedmont to a semi-distributary flow pattern near Moore Road. Flow patterns again become tributary as they enter the site.

FLO-2D was used to model this watershed because it is a coupled model which models rainfall runoff from discrete areas and then routes the runoff over a grid representing the terrain of the watershed. It was decided that this was a more appropriate approach than using a lumped parameter approach (HEC-HMS, etc.) which may oversimplify the watershed conditions and not account for the interweaving of flows within this watershed.

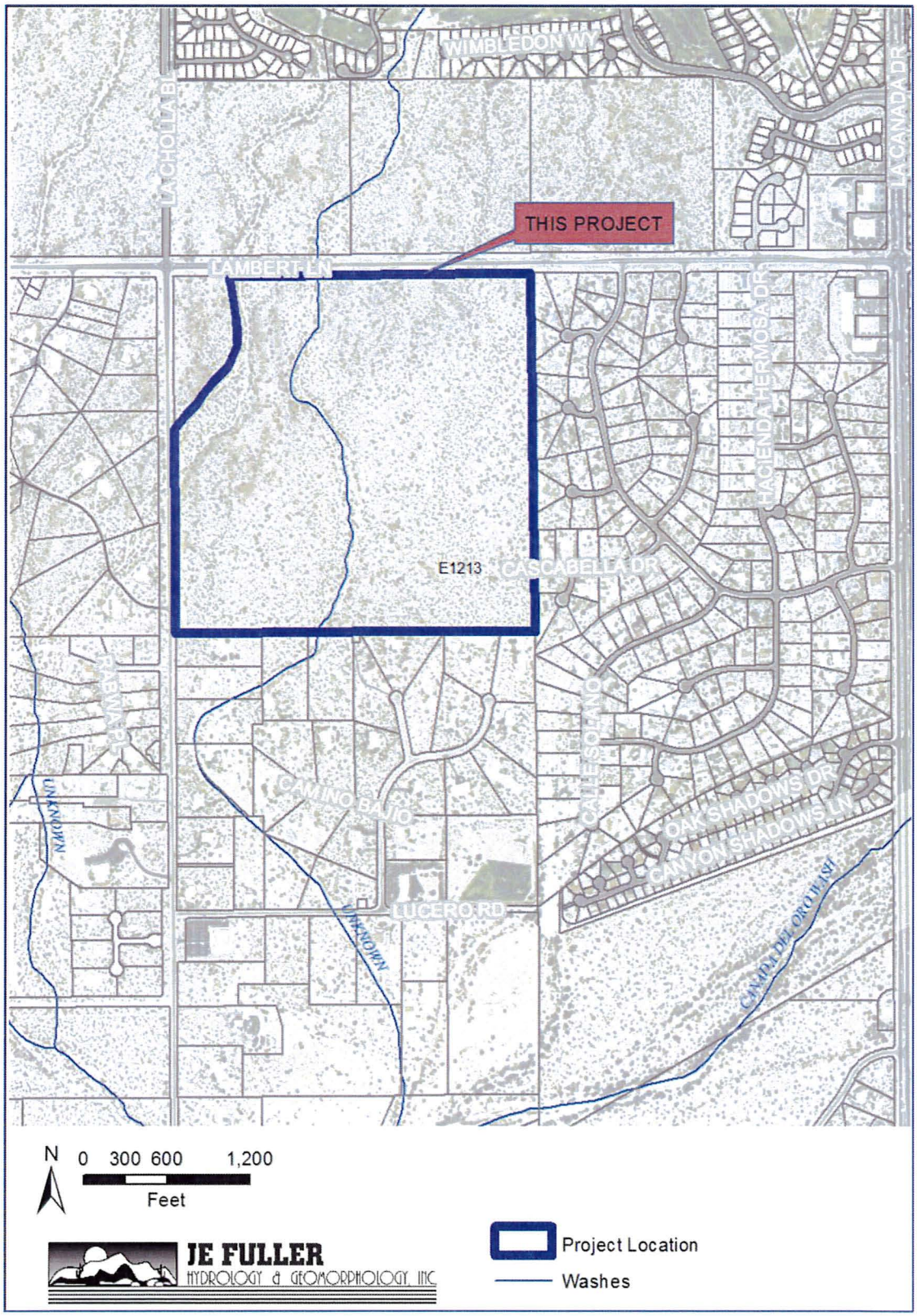


Figure 1. Project Location

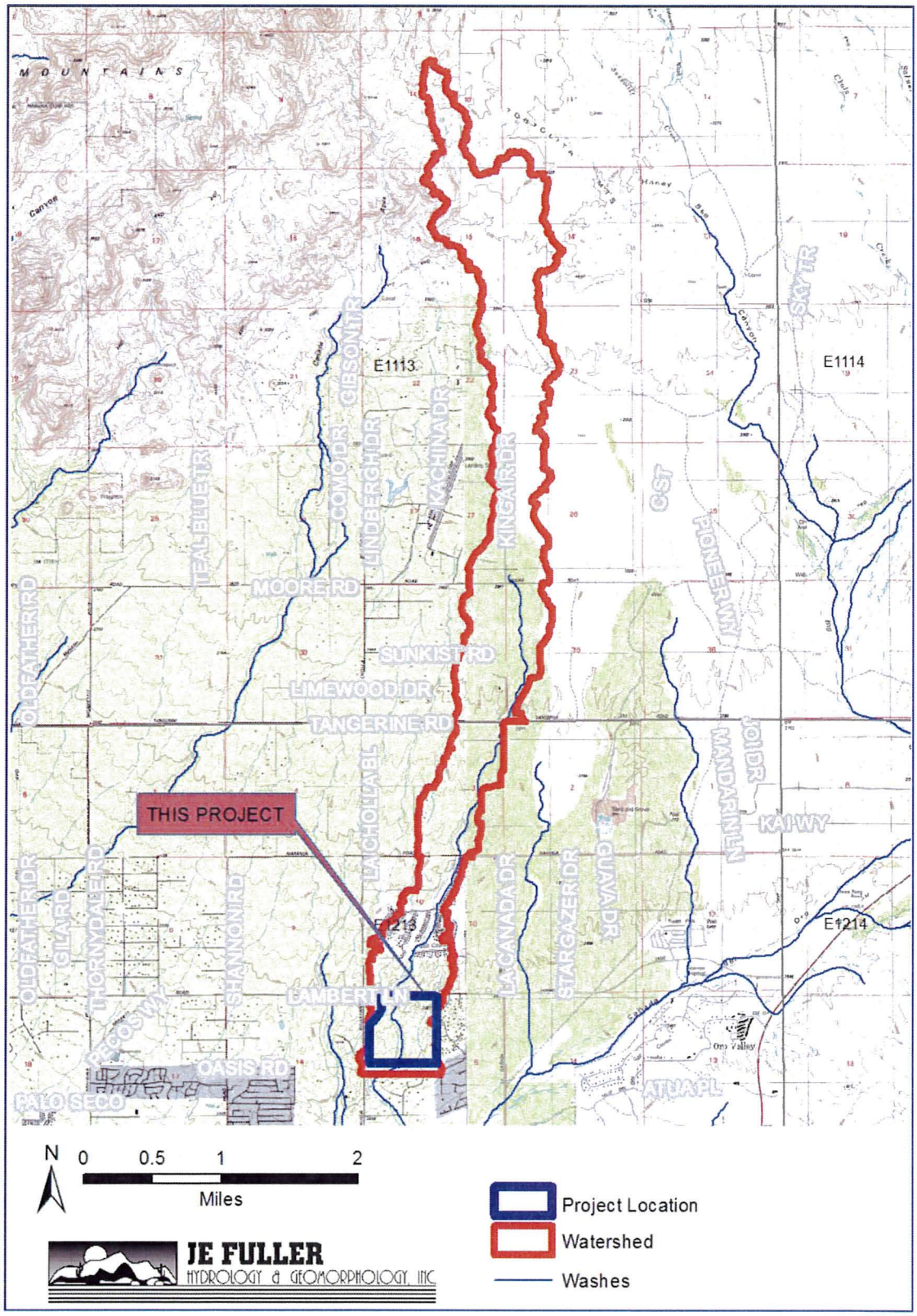


Figure 2. Watershed Map.

2 Existing Conditions FLO-2D Models

2.1 Overview

The existing conditions model prepared for this project has a 20-foot grid and utilizes PAG elevation data provided by the WLB Group. The 100-year 3-hour and 24-hour storms were modeled, however only the 3-hour storm is provided with this report.

2.2 Model Methodology

The procedure followed to develop the project FLO-2D model has been utilized by JE Fuller in a number of similar projects. The project FLO-2D model domain was developed to account for the incoming watershed, the project itself, and a short distance downstream of the project. A total of 238,199 grid elements were modeled, covering 3.4 square miles.

2.2.1 Elevations

Elevations for the project model were obtained from PAG elevation data provided by the WLB Group.

2.2.2 Rainfall

Rainfall was modeled using upper 90% NOAA [1] data. The rainfall depths are spatially distributed over the study area by sampling from NOAA provided rainfall raster data. The 100-year, 3-hour depth varies from 3.18 to 3.40 inches over the watershed. A uniform depth of 4.6 inches was identified for the 24-hour storm.

The 3-hour rainfall distribution is a SCS Type II distribution described in Pima County Tech Policy TECH-018, Acceptable Model Parameterization for Determining Peak Discharges. The 24-hour distribution is a SCS Type I distribution.

2.2.3 Infiltration

Infiltration was modeled using the Pima County SCS methodology within the FLO-2D model. This procedure requires three shape file layers to compute the Curve Number:

- Impervious cover, with values in the range of 0<IMP<1.0. Impervious cover was defined within a shape file with these parameters:
  - Bare Earth: Imp=0.10.
  - Residential Areas: Imp=0.30 (assuming an average of 2 houses per acre).
  - Streets: Imp=0.95.
- Land cover with cover density in the range of 0<CD<1.0. Land cover was defined within a shape file with these parameters:
  - Golf Courses: Urban Lawn with 60% cover density.
  - All other areas: Desert Brush with 20 % cover density.
- Soils type. Soils data was obtained from Pima County via their shape file "

Curve numbers are computed for each grid element based upon soil type, vegetation type, vegetation cover density, and impervious cover percentage. Curve numbers vary from less than 78 in golf course areas to nearly 98 along road surfaces. These parameters are summarized within Figure 3.

2.2.4 Roughness

The Floodplain Manning's Roughness values were defined spatially with a shape file by identifying areas with similar characteristics as follows:

- Streets. N=0.020.
- Bare desert and/or undeveloped land. N=0.045.
- Drainage ways through development. N=0.045.
- Golf courses. N=0.030.
- Residential development. N=0.085.
- Upper slopes (steep slopes in upper watershed, north of Tortolita Mountain Ci. N=0.065.

By default, FLO-2D will address the roughness of the watershed using multiple parameters. The first is the floodplain roughness value (described above) which is applied to flow depths of 3.0 feet or more. The second parameter is the shallow roughness value, which is applied to depths of 0.5 feet or less. Roughness values in-between 0.5 and 3.0 feet are adjusted up from the roughness value with depths of 0.5 feet having a roughness value of approximately 1.4 times the defined value. This last parameter is called the Depth Varied Roughness. These parameters can be turned off and the model will apply the Floodplain Roughness Value to all flow depths.

It has been found in recent models that turning off the Depth Varied Roughness and the Shallow Roughness parameters leads to an increase in flow velocities, short times to peak, and ultimately higher discharges. Both approaches were followed for this project and it was found that turning off these two parameters generated the most conservative discharges, increasing them 15-20 percent versus using the standard procedures. The model provided with this report has the Shallow and Depth Varied Roughness Parameters turned off.

2.3 Special Considerations

The upstream watershed contains a number of culvert crossings. Unless culverts are placed into the model, water artificially ponds behind road crossings and excess attenuation occurs. The purpose of this study was to identify peak discharges at the project boundary, therefore it is not feasible to accurately define each of these crossings. Two methods exist to account for this issue. The first is to simply redefine the grid elevations so that flow crosses the road. The second is to define an assumed culvert crossing at these locations. This latter method was used and two generic rating tables were constructed in HY-8. One is a 10 foot wide by 6 foot high box, the other is a 20 foot wide by 6 foot high box. These sizes are typically larger than the actual culvert that is in the ground and therefore this is a conservative approach in regards to underestimating attenuation.

2.4 Results

The resulting discharges are shown on Exhibits 1 and 2, attached to this report within Appendix A. The 3-hour storm generated the highest discharges at all locations where flow recording cross sections were placed within the model. Table 1 records runoff volumes and peak discharges at key locations. Regulatory discharges enter the project at CP 120, CP 210, CP 310, and CP 320.

Table 1. FLO-2D Design Discharges and Runoff Volumes

Concentration Point / Point of interest	FLO-2D FPXSEC Cross Section ID	100 year, 3-hour discharge (cfs)	100 year, 3-hour runoff volume (ac-ft)
110	10	**30**	0.9
120	1	**480**	82.5
210	2	**870**	146.3
310	19	**125**	5.1
320	20	**85**	3.0
1110	13	**430**	81.1
1210	15	**75**	2.2
1220	16	**35**	1.0
1230	17	**815**	158.8
1310	18	**325**	14.9

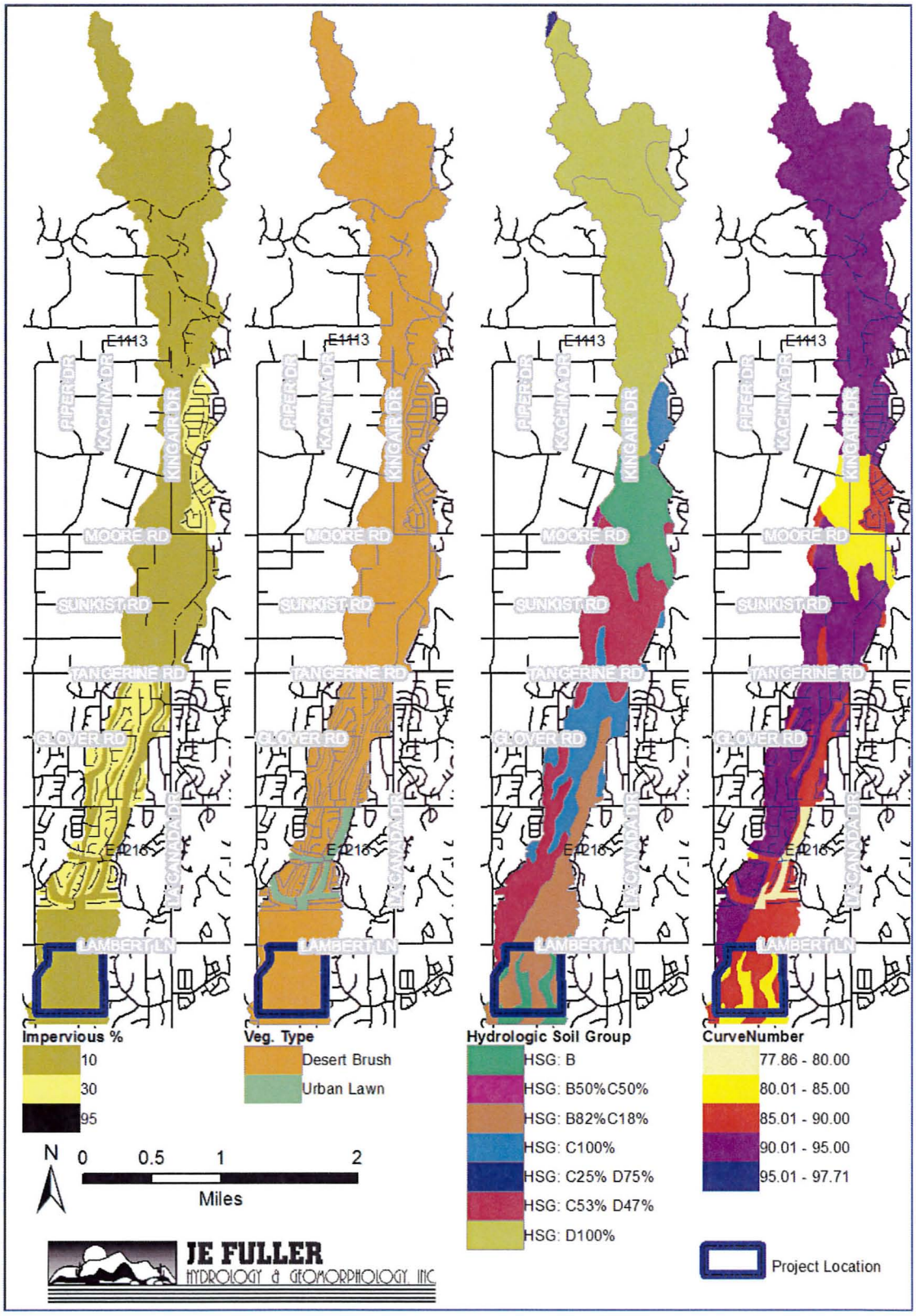


Figure 3. Landuse and Curve Number Overview.

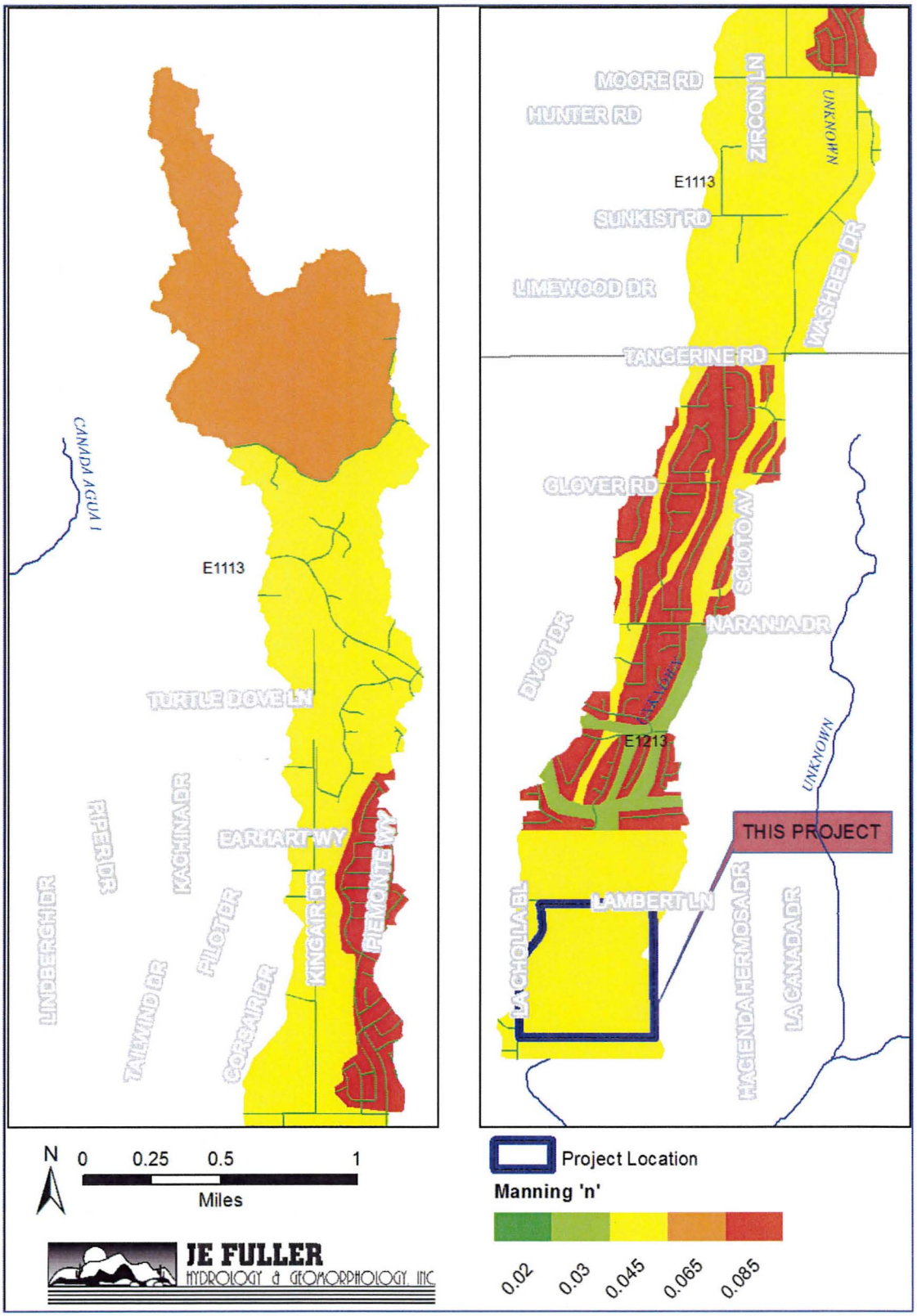


Figure 4. Manning's roughness.

3 Summary and Conclusions

This report presented the information necessary to define the design, 100-year discharges entering and exiting the project in the existing condition. The following is a summary of the technical information presented:

- Offsite drainage was computed with FLO-2D using a 20-foot grid.
- Runoff with discharges greater than 100 cfs enters into the site along the northern end of the project at four locations. Flow through the site generally heads south and exits at one location along the western boundary and 2 locations along the southern boundary.

4 References

[1] National Oceanic and Atmospheric Administration, *NOAA ATLAS 14 Precipitation-Frequency Atlas Volume 1 Version 5.0: Semiarid Southwest (Arizona,,* <http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>, 2011.

OFFSITE DRAINAGE ANALYSIS FOR:
SAHUARITA ACRES

Appendix A. Exhibits

Exhibit 1. Existing Conditions FLO-2D Model - Overview

Exhibit 2. Existing Conditions FLO-2D Model – Project Level

OFFSITE DRAINAGE ANALYSIS FOR: LA CHOLLA AND LAMBERT SEC

Appendix B. Existing Conditions FLO-2D Model

100-year 3-hour model:
WLB_FTRAZ_100_03_AMANN=-99

Legend

- This project
- Parcels
- FLO-2D domain
- Q=xxx FLO-2D Flow Record With Design Discharge (cfs)

100-year flow velocity (ft/sec)

- <2
- 2-4
- 4-6
- 6-8
- >8

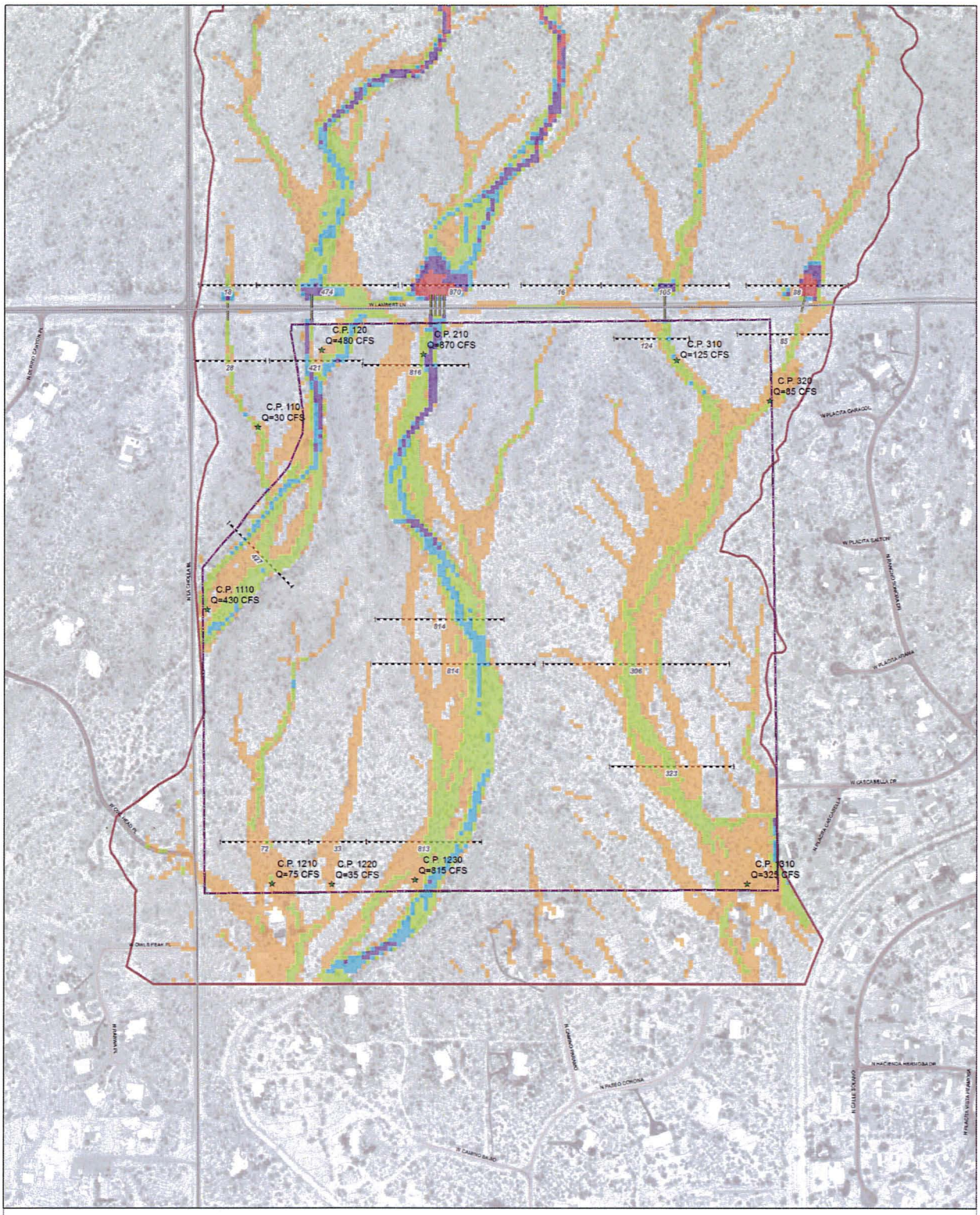
Exhibit 1: Existing Conditions FLO-2D Model - Overview

This exhibit shows the results of a FLO-2D model of the 100-year storm through the subject property. Elevation data is PAG 2008 DEM.

0 400 800 1,600 2,400 3,200 Feet

1 inch = 800 feet

JE Fuller H/G | lps
40 E. Helen St.
Tucson, Az 85705
May 2015



Legend

- This project
- Parcels
- FLO-2D domain
- Q=xxx Culverts (approximate)
- FLO-2D Flow Record With Design Discharge (cfs)

100-year flow depth (feet)

- 0.03 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1.0 - 1.5
- 1.5 - 2.5
- >2.5

Exhibit 2: Existing Conditions FLO-2D Model

This exhibit shows the results of a FLO-2D model of the 100-year storm through the subject property. Elevation data is PAG 2008 DEM.

0 100 200 400 600 800 Feet

1 inch = 200 feet

JE Fuller H/G | ips
40 E. Helen St.
Tucson, Az 85705
May 2015

PRELIMINARY TRAFFIC IMPACT ANALYSIS

TRAFFIC IMPACT ANALYSIS

LAMBERT LA CHOLLA

1 OCTOBER 2014

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CERTIFICATE NO.
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ANDREW R.
SMIGIELSKI
Date Signed 1 Oct 14
ARIZONA, U.S.A.

Expires 3-31-16

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TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

Executive Summary

The purpose of this traffic study is to evaluate the current and future transportation system within the project study area surrounding the site without and with the proposed neighborhood project and analyze traffic operations at the existing project study intersections.

Existing and Future Traffic Data Without Project

In order to document current traffic volumes, traffic counts were taken at the existing signalized intersection of La Cholla Boulevard/Lambert Lane as well as at the un-signalized intersection of La Cholla Boulevard/Owl Head Place.

The traffic counts included turning movement counts during the weekday AM and PM peak hours of 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM.

24 hour traffic counts were taken on Lambert Lane, east of La Cholla and on La Cholla, south of Lambert Lane.

Both of the existing study intersections and study roadway segments currently operate at an adequate level of service (LOS) during the weekday AM and PM peak hours and are predicted to continue doing so in 2016, without traffic from the project.

Future Traffic Data With Project

All of the existing study intersections and study roadway segments are anticipated to continue operating at an adequate LOS during the weekday AM and PM peak hours in 2016, with traffic from the proposed neighborhood project.

Turn Lane Analysis

The turn lane analysis shows that a southbound left turn lane is warranted at the intersection of South Driveway (Owl Head Place)/La Cholla Boulevard. A westbound left turn lane is warranted at the intersection of North Driveway/La Cholla Boulevard.

Recommendations

Exclusive left turn lanes should be provided for vehicles entering the project site at both access intersections.

New STOP signs and associated STOP bar pavement markings are recommended for both northbound vehicles exiting the project through the North Driveway and westbound vehicles exiting through the south driveway.

Another improvement which should be considered is removing impediments to driver sight lines. In particular, vegetation near the northwest and southwest corners of the intersection of La Cholla Boulevard/Owl Head Place should be removed to maximize driver visibility. In addition, sight distances at the future proposed access points and internal intersections should be verified during the design process.

TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

Project Description

Future Arizona, LLC proposes a new residential development on an undeveloped piece of property located on the southeast corner of La Cholla Boulevard/Lambert Lane in Oro Valley, Arizona. The vicinity of the project is shown in **Figure 1**. The site is located as shown in **Figure 2**. The project will consist of 154 new single-family homes with an expected opening year of 2016. Access to the project site will be from the existing intersection of La Cholla Boulevard/Owl Head Lane as well as one new access point on Lambert Lane.

The purpose of this traffic impact analysis is to:

- Evaluate the future operational characteristics of the adjacent roadway network surrounding the project site.
- Estimate the traffic generation associated with the project and assign that traffic to the existing roadway system.
- Analyze traffic operations at the existing intersections of La Cholla Boulevard/Lambert Lane and La Cholla Boulevard/Owl Head Lane as well as an additional new project access point.
- Analyze traffic operations for the roadway segments of Lambert Lane, east of La Cholla Boulevard and La Cholla Boulevard, south of Lambert Lane.
- Determine the need for auxiliary turn lanes into the project site at the two access intersections.

The author of this report is a registered professional engineer (civil) in the State of Arizona having specific expertise and experience in the preparation of traffic impact analyses.

Study Methodology

In order to analyze and evaluate the potential traffic impacts of the proposed development, the following tasks were undertaken:

- Field observation of the proposed site and surrounding area was conducted to evaluate the existing physical and operational characteristics of the adjacent roadway network.
- Site traffic volumes generated by the proposed site were calculated using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition,* 2012.
- Trip distribution assignments were made and used to assign the site traffic to the primary roadways within the project study limits.

Figure 1 – Vicinity Map

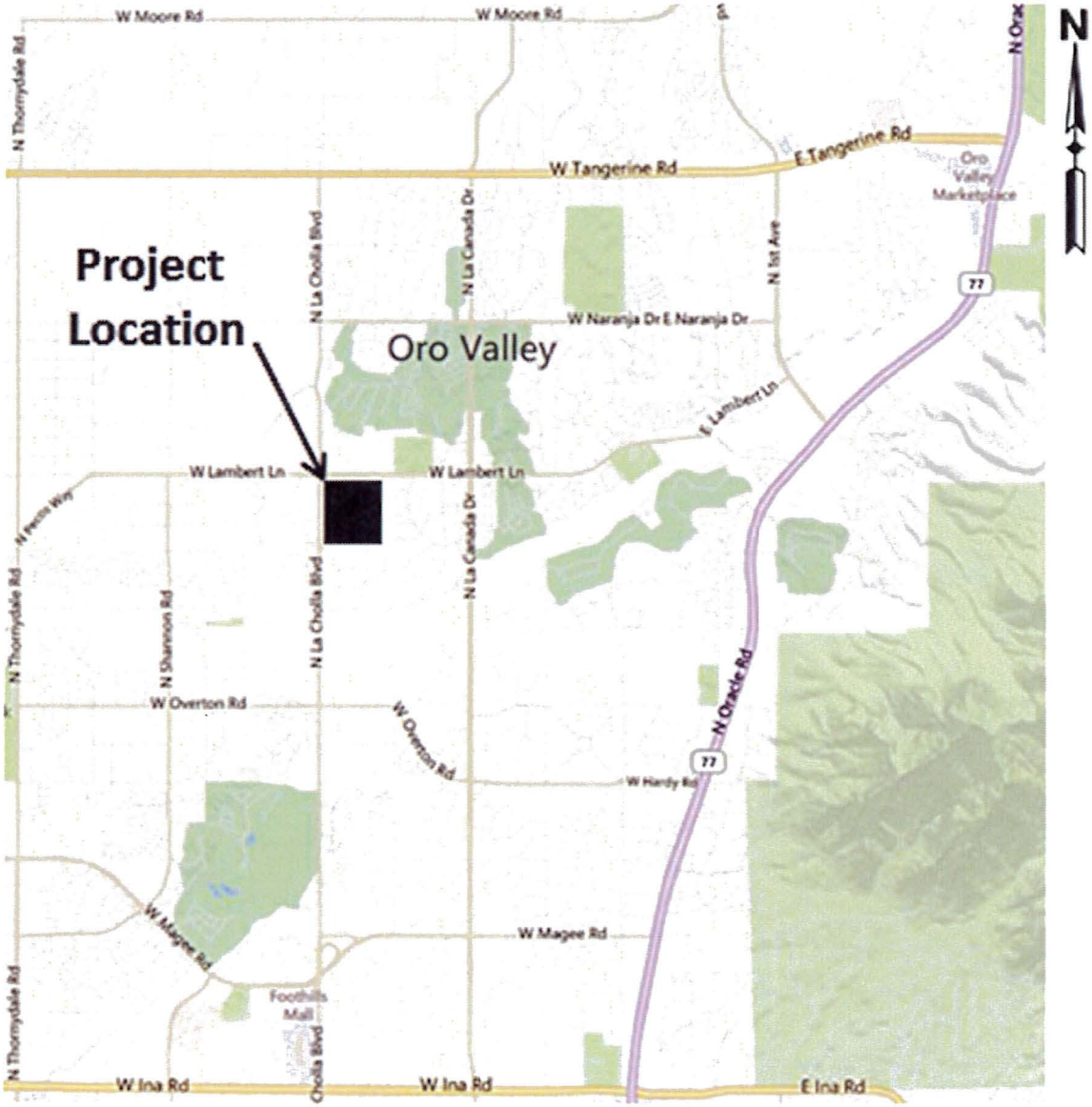


Figure 2 – Site Plan

- Capacity analyses were performed for the existing conditions and future conditions without and with the project based on an opening year of 2016.
- The intersections and roadway segments were analyzed using the methodology presented in the *2010 Highway Capacity Manual (HCM)*.
- The need for auxiliary turn lanes at the proposed access intersections was evaluated using Pima County guidelines.

Existing Conditions

The study location includes the signalized intersection La Cholla Boulevard/Lambert Lane as well as the un-signalized intersection of La Cholla Boulevard/Owl Head Place.

The project site is located on the southeast corner of La Cholla Boulevard/Lambert Lane.

In the vicinity of the project La Cholla Boulevard is a rolling roadway with a posted speed limit of 45 miles per hour (mph). Near Lambert Lane, La Cholla Boulevard is a two-lane roadway with one lane in each direction. A dirt shoulder exists along both sides of the La Cholla Boulevard and overhead power is present on the west side of the roadway. North of the project La Cholla Boulevard provides access to residential homes for approximately three miles before ending at Moore Road. To the south, La Cholla Boulevard leads to the City of Tucson. Near Owl Head Road, La Cholla Boulevard has large amounts of shrubs and vegetation in close proximity to the west side of the roadway.

Lambert Lane is a two-way roadway with overhead power lines located on the east side of the road. A dirt shoulder is provided on both sides of Lambert Lane and the posted speed limit is 45 mph. One and one half miles west of the project, Lambert Lane becomes Pecos Way before continuing for another one half mile and ending at Thornydale Road. Lambert Lane runs approximately four miles to the east of the project location before ending at Oracle Road (State Route 77).

Owl Head Place is an unstriped, two-way street, with a posted speed limit of 25 mph. Owl Head Place exists to provide access to seven residences and is approximately one quarter mile long. There are no curb, gutter, lighting or sidewalk facilities provided on Owl Head and the roadway is bordered on both sides by desert.

La Cholla Boulevard/Lambert Lane is a signalized intersection that provides crosswalk facilities across all four legs of the intersection. All of the approaches are offered an exclusive left turn lane and a shared through/right turn lane. Protected/permitted left turn phasing is exists for all four approaches of the intersection.

The intersection of La Cholla Boulevard/Owl Head Place is located approximately 2,500 feet south of the intersection of La Cholla Boulevard/Lambert Lane. This un-signalized "T" intersection is STOP sign controlled for the eastbound approach while the northbound/southbound traffic on La Cholla Boulevard is free-flow. Northbound vehicles turning onto Owl Head Place from La Cholla Boulevard are provided with a shared through/left turn lane while southbound vehicles have a shared though/right turn lane.

Existing lane configurations and traffic control are shown in **Figure 3**.

Existing Traffic Data

In order to form a basis for analysis of the project impacts, weekday AM and PM peak hour turning movement counts were conducted at the existing intersections of La Cholla Boulevard/Lambert Lane and La Cholla Boulevard/Owl Head Place.

In addition, weekday 24-hour bi-directional traffic counts were taken on Lambert Lane, east of La Cholla Boulevard and on La Cholla Boulevard, south of Lambert Lane.

The weekday turning movement counts were conducted from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM in August 2014.

The existing weekday AM and PM peak hour traffic volumes are shown in **Figure 4**. The complete traffic count summaries can be found in the Appendix.

Planned Town of Oro Valley Improvements

Proposed Oro Valley improvements to La Cholla Boulevard are in the initial planning phase. These improvements will include the installation of a center raised median along La Cholla Boulevard, adjacent to the project site. This median will restrict left turns on La Cholla Boulevard except at planned median breaks at major intersections, including La Cholla Boulevard/Lambert Lane and La Cholla Boulevard/Owl Head Place.

Improvements to Lambert Lane are also in the initial planning phase and will extend the existing roadway improvements (5-lane roadway section with median), just east of La Cañada Drive, to the west. The improvements will include a 4-lane, median separated road with bike lanes, a multi-use path on the south side of the roadway and sidewalk on the north side of the roadway that will taper down to two lanes starting at Rancho Sonora Drive.

The planned roadway improvements to La Cholla Boulevard and Lambert lane are in very early design stages and are not anticipated to begin until no sooner than 2020.

Access

Access to the proposed neighborhood will be provided by the existing intersection of La Cholla Boulevard/Owl Head Place as well as one new access point on Lambert Lane.

The new access point, North Driveway, will be located on the south side of Lambert Lane, approximately 2,000 feet east of La Cholla Boulevard. Vehicles exiting the proposed neighborhood through the North Driveway will be provided with a left turn lane and a right turn lane while eastbound and westbound traffic on Lambert Lane will have use of a single shared through/turn lane. Northbound vehicles will be STOP sign controlled while eastbound and westbound traffic on La Cholla Boulevard will remain free-flow.

Figure 3 – Existing Lane Configurations and Traffic Control

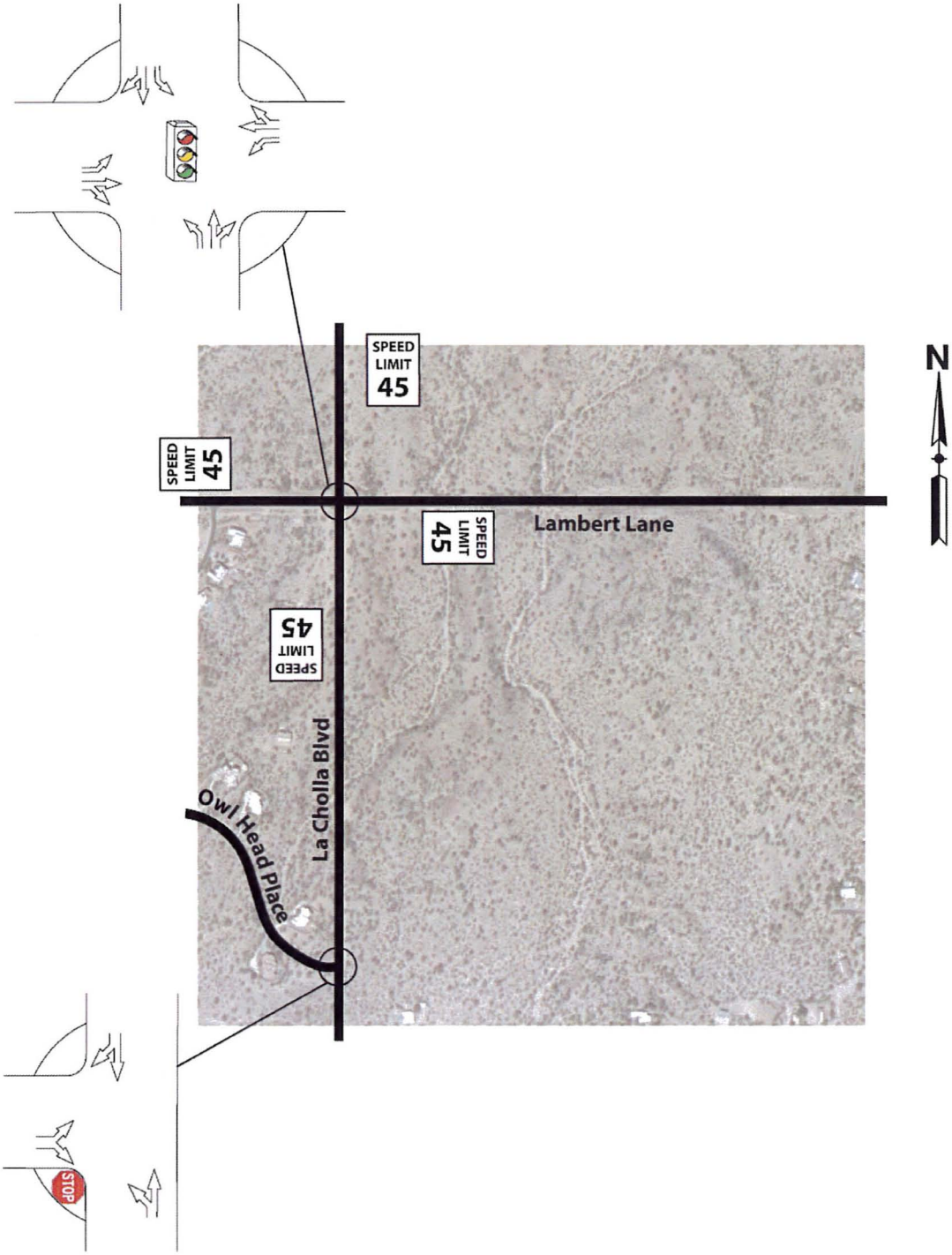
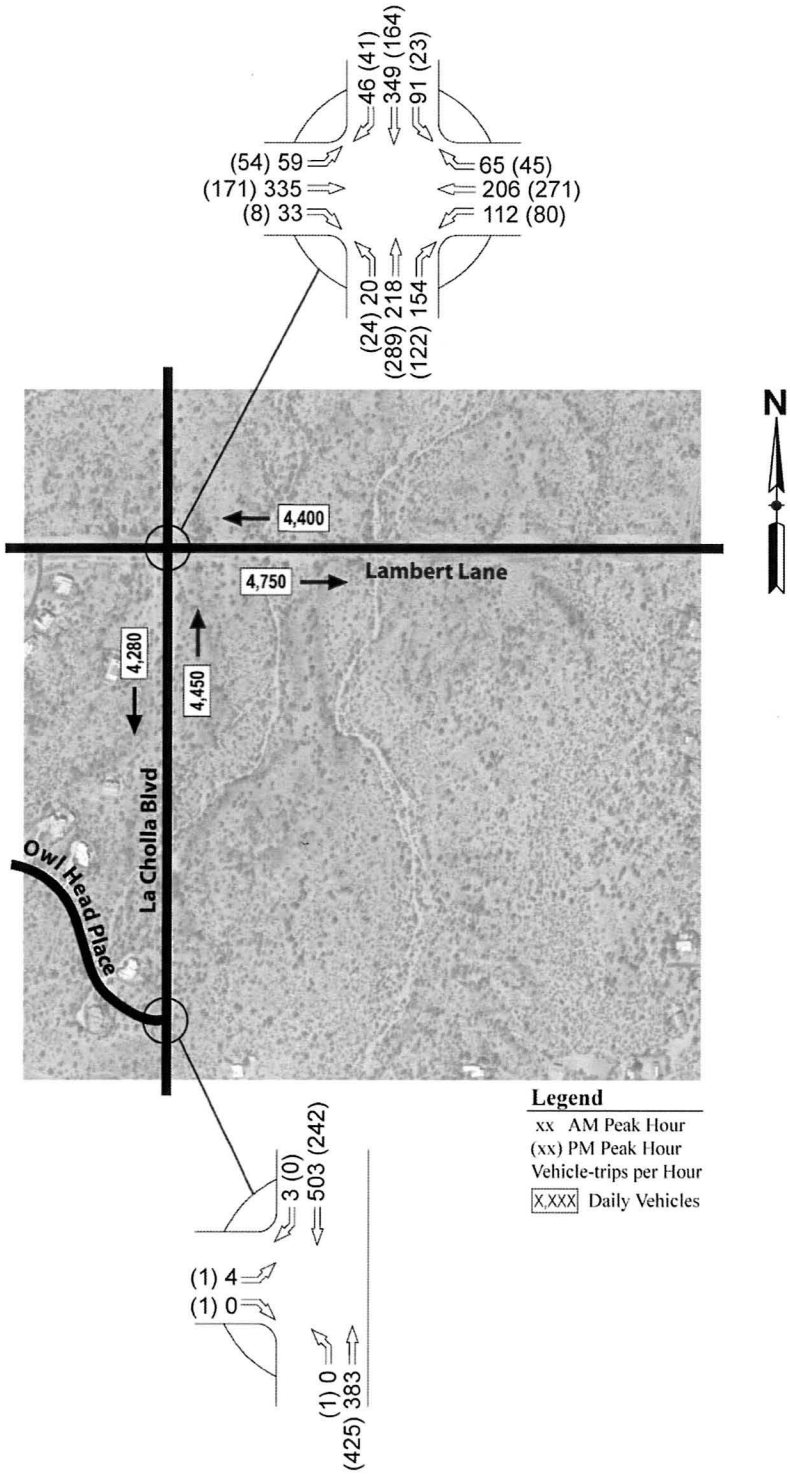


Figure 4 – Existing Weekday Peak Hour Traffic Volumes



A second access point will become the east leg of the existing intersection of La Cholla Boulevard/Owl Head Place. This new leg of the intersection will provide westbound vehicles with a left turn lane and a shared through/right turn lane. Eastbound and westbound vehicles will be free-flow while northbound and southbound traffic on La Cholla Boulevard will remain free-flow.

Sight distances at the future proposed access points and internal intersections should be verified during the design process.

Trip Generation

Trip generation for the project was developed utilizing nationally agreed upon data contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 9th Edition*, 2012.

So as to provide analysis for the full build-out of the project, trip generation was estimated for the construction of 154 single-family homes based on ITE Land Use Code (LUC) 210, Single-Family Detached Housing.

The result is the expected weekday trip generation for the new project, as shown in **Table 1**. The complete trip generation calculations can be found in the Appendix.

Table 1 – Weekday Project Site Generated Trips

Time Period	Single Family Housing
Average Daily, Inbound (vtpd)	782
Average Daily, Outbound (vtpd)	782
Total Daily	**1,564**
AM Peak Hour, Inbound (vtph)	30
AM Peak Hour, Outbound (vtph)	89
Total AM Peak	**119**
PM Peak Hour, Inbound (vtph)	98
PM Peak Hour, Outbound (vtph)	57
Total PM Peak	**155**

vtpd - vehicle trips per day, vtph - vehicle trips per hour

Trip Distribution & Assignment

Trip distribution for the project was based on existing traffic volumes patterns near the proposed site. **Figure 5** shows the weekday trip distribution for the project as a percentage of net new primary trips.

Figure 6 shows the assignment of the new site generated trips to the project intersections within the study area.

Figure 5 – Weekday Peak Hour Trip Distribution

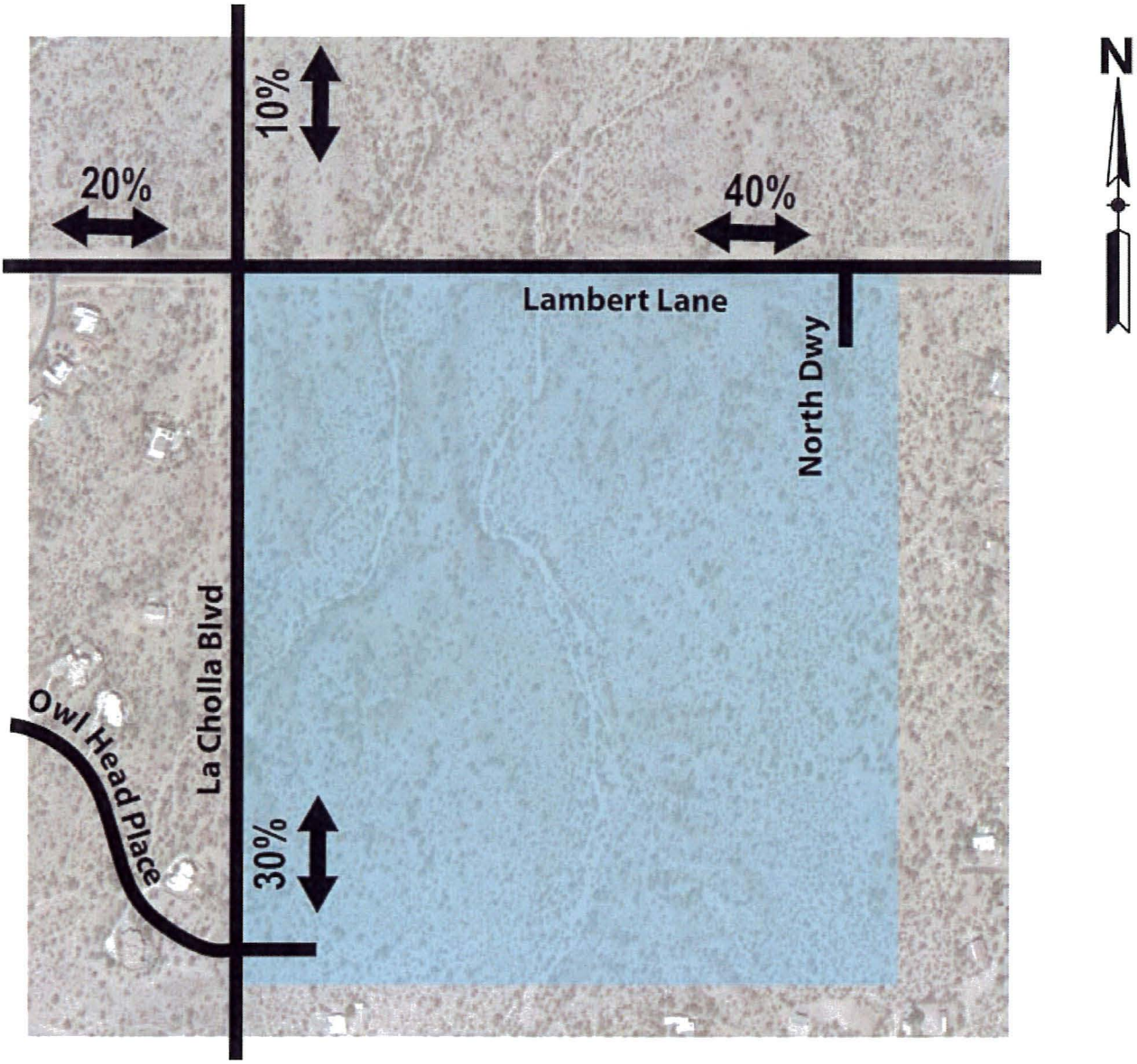
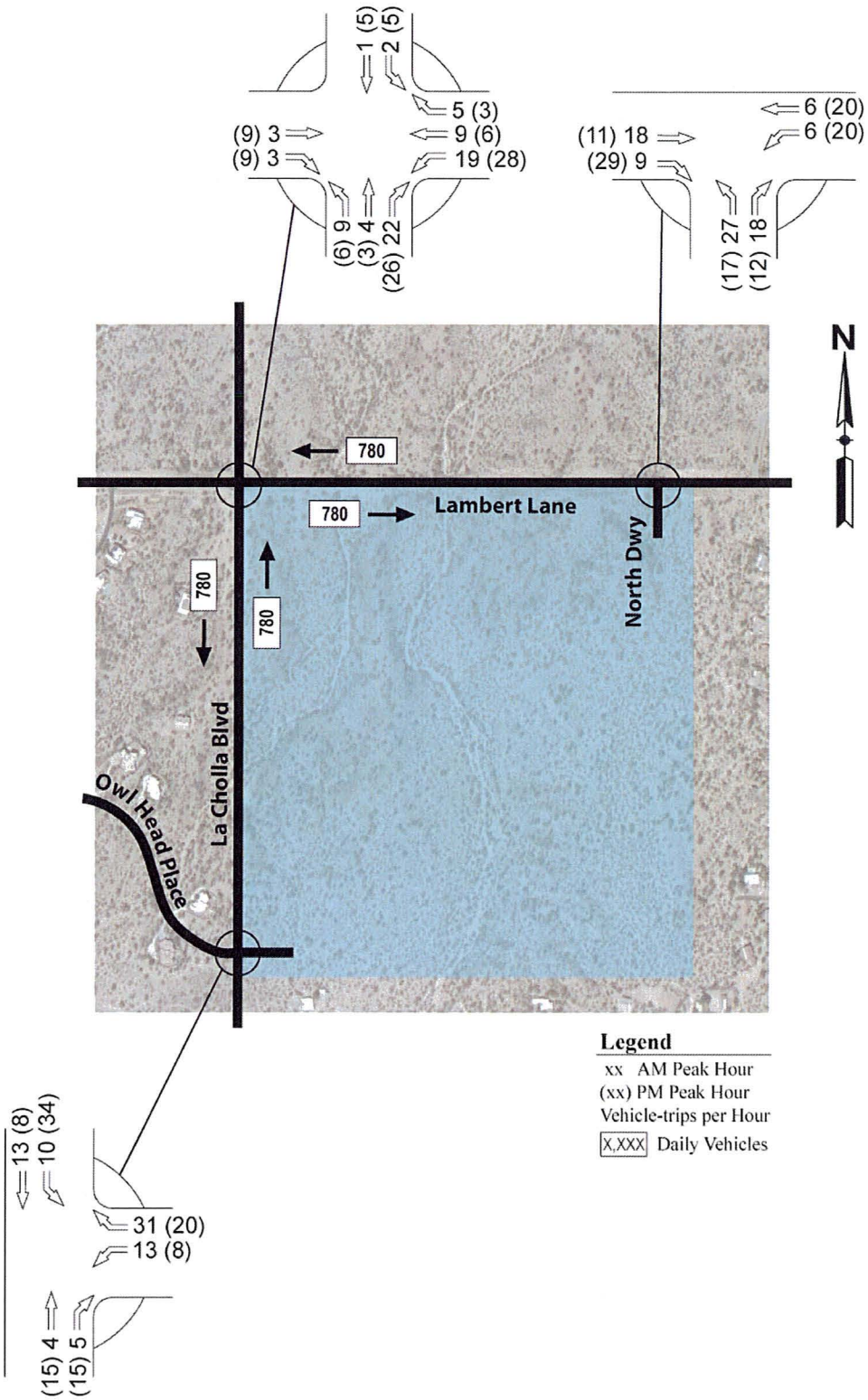


Figure 6 – Weekday Peak Hour Trip Assignment



Existing Traffic Operations

Analysis of current intersection operations was conducted for the weekday AM and PM peak hours using the nationally accepted methodology set forth in the *Highway Capacity Manual,* Transportation Research Board, 2010. The computer software Synchro 8 was utilized to calculate the levels of service for individual movements, approaches, and for the intersections as a whole. The computer software HCS 2010 was used to calculate the levels of service for the project roadway segments.

Level of service (LOS) is a qualitative measure of the traffic operations at an intersection or on a roadway segment. Level of service is ranked from LOS A, which signifies little or no congestion and is the highest rank, to LOS F, which signifies congestion and jam conditions. LOS D is typically considered adequate operation at signalized and un-signalized intersections in developed areas.

At signalized intersections, level of service is calculated for each movement and then is summed in a weighted fashion to yield the LOS for the approach and for the intersection as a whole. The criteria for level of service at signalized intersections are shown in **Table 2.**

Table 2 - Level of Service Criteria – Signalized Intersections

Level-of-Service	Average Total Delay
A	≤ 10.0 seconds
B	> 10.0 and ≤ 20.0 seconds/vehicle
C	> 20.0 and ≤ 35.0 seconds/vehicle
D	> 35.0 and ≤ 55.0 seconds/vehicle
E	> 55.0 and ≤ 80.0 seconds/vehicle
F	> 80.0 seconds per vehicle

In calculating the levels of service, assumed signal phasing and timing data was used. Other assumptions included:

- Cycle length – 90 seconds
- Lane widths – 12 feet
- Approach grade – 0%
- Right turn on red allowed

At un-signalized intersections, level of service is predicted/calculated for those movements which must either stop for or yield to oncoming traffic and is based on average control delay for the particular movement. Control delay is the portion of total delay attributed to traffic control measures such as stop signs and traffic signals. The criteria for level of service at un-signalized intersections are shown below in **Table 3**.

Table 3 – Level of Service Criteria – Un-signalized Intersections

Level-of-Service	Delay
A	≤ 10 seconds
B	> 10 and ≤ 15 seconds/vehicle
C	> 15 and ≤25 seconds/vehicle
D	> 25 and ≤ 35 seconds/vehicle
E	> 35 and ≤ 50 seconds/vehicle
F	> 50 seconds per vehicle

Existing levels of service were calculated for the project intersections within the study area. The results of this analysis are shown in **Table 4**. Complete capacity calculations are included in the Appendix.

Table 4 – Existing Peak Hour Levels of Service

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Signalized Intersections				
Lambert Lane/La Cholla Boulevard				
Overall Intersection	B	12.2	A	9.1
Eastbound Left	B	13.4	B	11.9
Eastbound Through/Right	B	11.6	A	8.3
Westbound Left	B	16.8	A	9.9
Westbound Through/Right	B	10.7	A	9.6
Northbound Left	B	15.0	A	8.3
Northbound Through/Right	B	11.7	A	9.2
Southbound Left	B	16.6	B	11.6
Southbound Through/Right	B	11.7	A	7.3
Un-Signalized Intersections				
La Cholla Boulevard/Owl Head Place				
Eastbound Left/Right	C	18.4	B	12.1
Northbound Left/Through	A	0.0	A	7.8

Delay - seconds per vehicle

As shown in **Table 4**, both of the existing study intersections currently operate at an adequate LOS C or better during the weekday AM and PM peak hours.

In order to verify existing roadway segment LOS on La Cholla Boulevard and Lambert Lane, an analysis was performed using existing traffic counts. The LOS on two-lane Type III highway segments is based on percent of free-flow speed (PFFS) which represents the average percentage of time that vehicles must travel in platoons behind slower vehicles due to their inability to pass. In order to perform a LOS analysis for the roadway segment analysis, the following assumptions were used:

- La Cholla Boulevard and Lambert Lane are classified as Type III Highways
- Free Flow Speed of 45 miles per hour (posted speed limit)
- Hourly factor (K) based on traffic counts

- Directional distribution based on traffic counts
- Rolling terrain

The level of service criteria for two-lane roadways with the above criteria is provided in **Table 5** based on values from Exhibit 15-3 of the *Highway Capacity Manual.*

Table 5 – Level of Service Criteria – Two-Lane Roadways

Level-of-Service	PFFS (%)
A	>91.7
B	>83.3-91.7
C	>75.0-83.3
D	>66.7-75.0
E	≤66.7

Table 6 shows the existing LOS for the roadway segments of La Cholla Boulevard, south of Lambert Lane and Lambert Lane, east of La Cholla Boulevard.

Table 6 – Existing Roadway Segment Levels of Service

Street	Segment	AM Peak		PM Peak	
		LOS	PFFS	LOS	PFFS
Lambert Lane	East of La Cholla Boulevard (Westbound)	C	77.3	C	80.8
	East of La Cholla Boulevard (Eastbound)	C	76.5	C	81.3
La Cholla Boulevard	South of Lambert Lane (Northbbound)	C	78.8	C	81.1
	South of Lambert Lane (Southbound)	C	78.3	C	81.9

As shown in **Table 6**, the existing roadway segments of La Cholla Boulevard and Lambert Lane currently operate at an adequate LOS C.

Future Traffic Operations Without Project

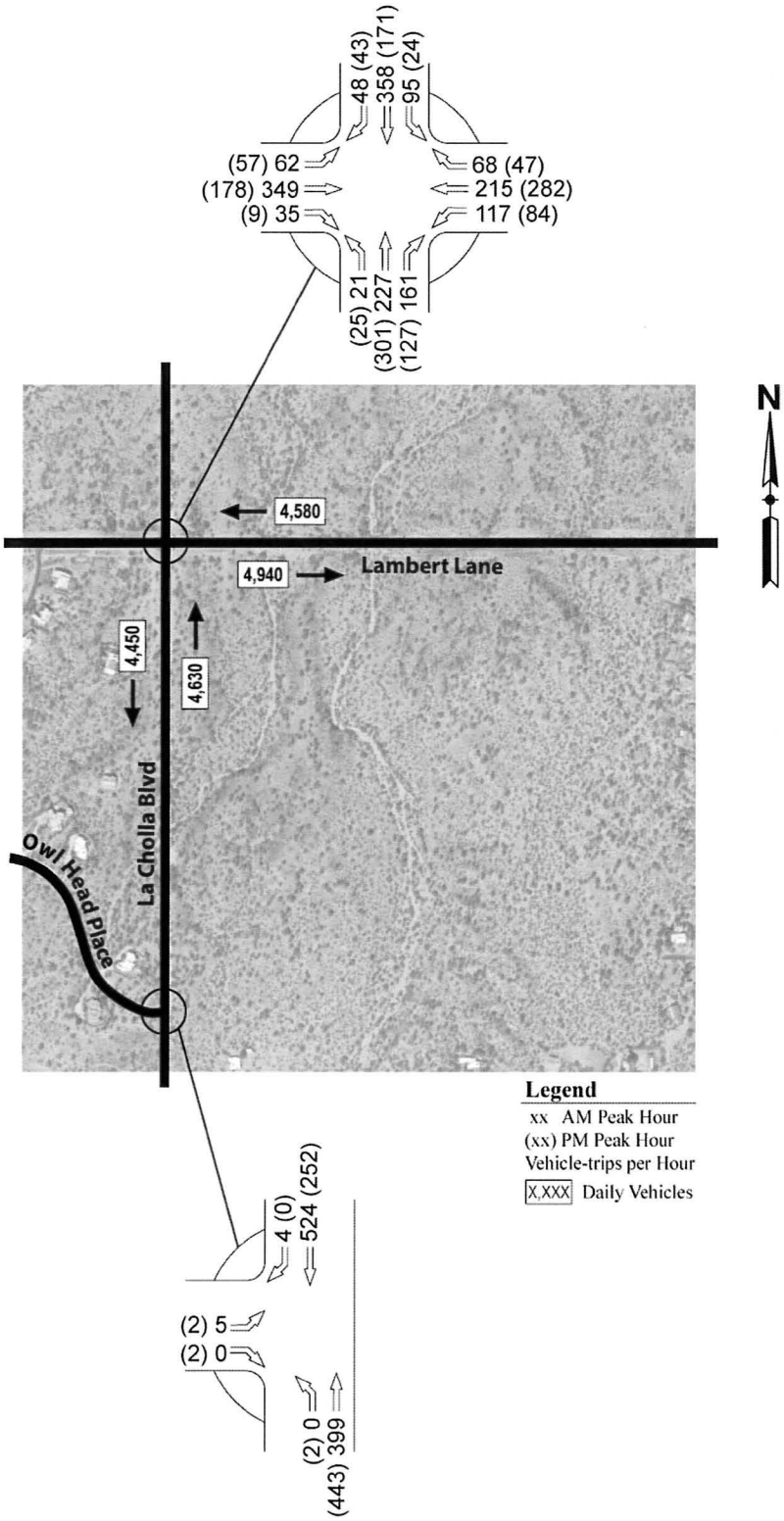
In order to assess the impacts of the project on future traffic operations, traffic projections were made for the year 2016, which is the year the project is expected to open.

A review of historical traffic data along La Cholla Boulevard and Lambert Lane taken from the Pima Association of Governments (PAG) traffic count program showed a pattern of increasing and decreasing traffic volumes on the project roadways from 2010 to 2013. In light of this, a 2% annual traffic growth rate was used.

Using a 2% annual traffic growth rate, 2016 weekday peak hour traffic volumes without the project were estimated as shown in **Figure 7.**

As with the current volumes, levels of service were calculated for each of the intersections and roadway segments in the study area for 2016 without the project.

Figure 7 – 2016 Weekday Peak Hour Traffic Volumes Without Project



Intersection levels of service for 2016 without the project are shown in **Table 7**. Roadway segment levels of service for 2016 without the project are shown in **Table 8**. Complete capacity calculations are included in the Appendix.

Table 7 – 2016 Peak Hour Levels of Service Without Project

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Signalized Intersections				
Lambert Lane/La Cholla Boulevard				
Overall Intersection	B	13.2	A	9.5
Eastbound Left	B	14.5	B	12.6
Eastbound Through/Right	B	12.5	A	8.6
Westbound Left	B	18.5	B	10.4
Westbound Through/Right	B	11.4	B	10.0
Northbound Left	B	16.4	A	8.8
Northbound Through/Right	B	12.7	A	9.7
Southbound Left	B	18.4	B	12.4
Southbound Through/Right	B	12.6	A	7.6
Un-Signalized Intersections				
La Cholla Boulevard/Owl Head Place				
Eastbound Left/Right	C	19.1	B	12.4
Northbound Left/Through	A	0.0	A	7.8

Delay - seconds per vehicle

Table 7 shows that the two existing study intersections are predicted to continue to operate at an adequate LOS C or better during the weekday peak hours of 2016, without traffic from the project.

Table 8 – 2016 Roadway Segment Levels of Service Without Project

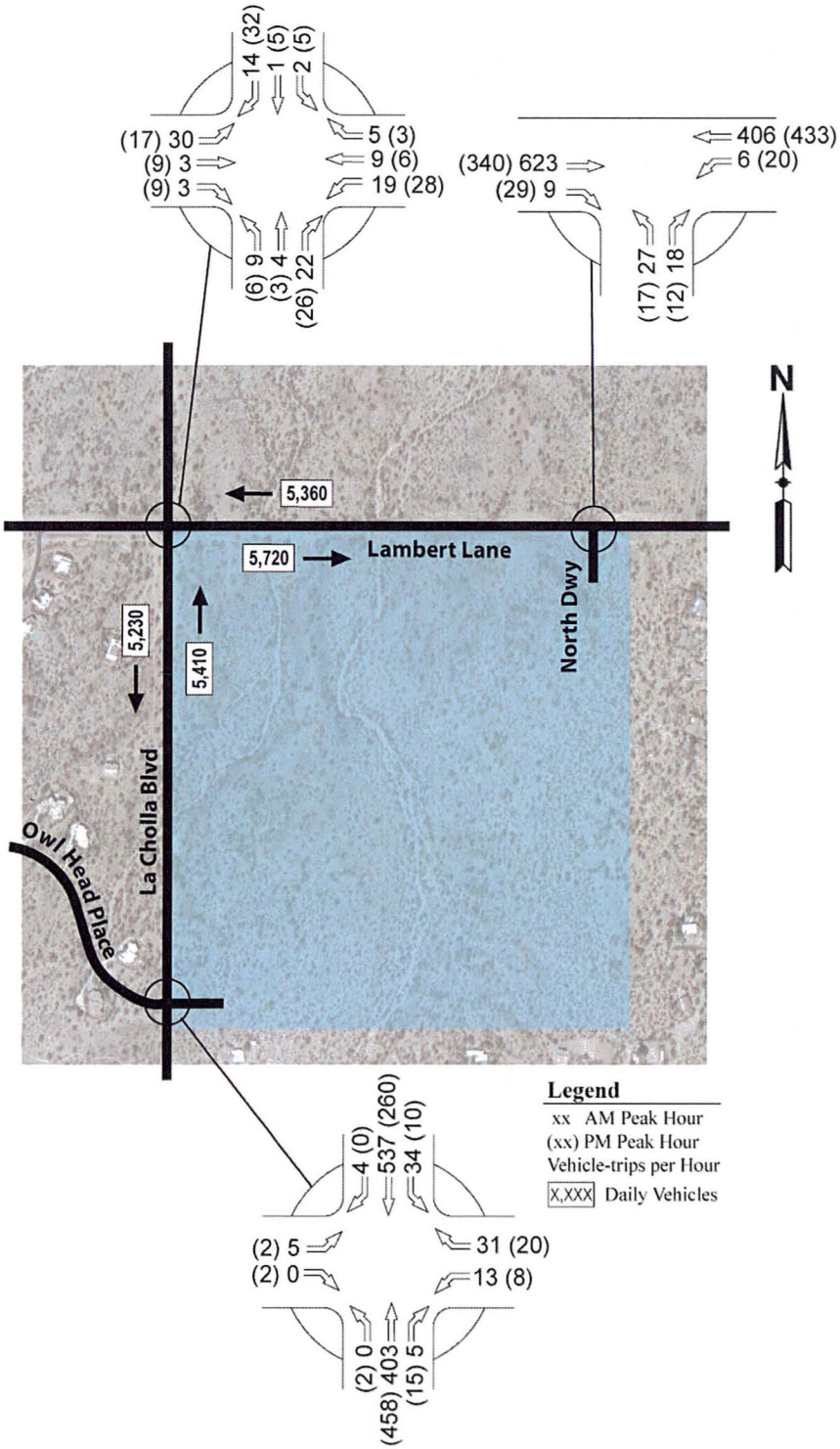
Street	Segment	AM Peak		PM Peak	
		LOS	PFFS	LOS	PFFS
Lambert Lane	East of La Cholla Boulevard (Westbound)	C	76.7	C	80.4
	East of La Cholla Boulevard (Eastbound)	C	76.0	C	80.8
La Cholla Boulevard	South of Lambert Lane (Northbbound)	C	78.2	C	80.6
	South of Lambert Lane (Southbound)	C	77.7	C	81.5

As shown in **Table 8,** all of the study roadway segments are predicted to continue to operate at an adequate LOS C in 2016, without traffic from the project.

Future Traffic Operations With Project

In order to assess the impacts of the project on future traffic operations, levels of service were calculated for each project intersection for 2016, with the project. Weekday peak hour traffic volumes for 2016 without the project were combined with the estimated trips generated by the project to yield weekday peak hour traffic volumes with the project as shown in **Figure 8.**

Figure 8 – 2016 Weekday Peak Hour Traffic Volumes With Project



Weekday intersection levels of service for 2016, with the project were then calculated as shown in **Table 9**. Roadway segment levels of service for 2016 without the project are shown in **Table 10**. Complete capacity calculations are included in the Appendix.

Table 9 – 2016 Peak Hour Levels of Service With Project

Intersection	2016 Without Project				2016 With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized Intersections								
Lambert Lane/La Cholla Boulevard								
Overall Intersection	B	13.2	A	9.5	B	14.7	B	10.3
Eastbound Left	B	14.5	B	12.6	B	16.1	B	13.9
Eastbound Through/Right	B	12.5	A	8.6	B	13.5	A	9.5
Westbound Left	B	18.5	B	10.4	C	20.9	B	12.1
Westbound Through/Right	B	11.4	B	10.0	B	12.5	B	10.9
Northbound Left	B	16.4	A	8.8	B	18.2	A	9.2
Northbound Through/Right	B	12.7	A	9.7	B	14.3	B	10.3
Southbound Left	B	18.4	B	12.4	C	21.3	B	13.7
Southbound Through/Right	B	12.6	A	7.6	B	13.8	A	7.9
Un-Signalized Intersections								
South Driveway (Owl Head Place)/La Cholla Boulevard								
Eastbound Left/Right	C	19.1	B	12.4	N/A		N/A	
Eastbound Left/Through/Right	N/A		N/A		D	25.6	B	14.9
Westbound Left					C	24.8	C	19.6
Westbound Through/Right					B	11.3	B	11.7
Northbound Left/Through	A	0.0	A	7.8	N/A		N/A	
Northbound Left/Through/Right	N/A		N/A		A	0.0	A	7.8
Southbound Left/Through/Right					A	8.3	A	8.6
North Driveway/Lambert Lane								
Westbound Left	N/A		N/A		A	9.1	A	8.2
Northbound Left					B	14.9	B	11.8
Northbound Right					B	13.6	B	10.6

Delay - seconds per vehicle

Table 9 shows that all of the study intersections are anticipated to operate at an adequate LOS during the weekday peak hours of 2016, with traffic from the project.

Table 10 – 2016 Roadway Segment Levels of Service With Project

Street	Segment	2015 Without Project				2015 With Project			
		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS
Lambert Lane	Westbound	C	76.3	C	79.9	C	76.3	C	79.9
	Eastbound	C	75.6	C	80.4	C	75.6	C	80.4
La Cholla Boulevard	Northbound	C	77.3	C	79.3	C	77.3	C	79.3
	Southbound	C	76.9	C	80.3	C	76.9	C	80.3

As shown in **Table 10,** all of the study roadway segments are predicted to continue to operate at an adequate LOS C in 2016, with traffic from the project.

Turn Lane Analysis

A key element of this study is to determine if turn lanes are required at the two proposed project access points.

The latest edition of the *Pima County Subdivision and Development Street Standards* provides warrants for the inclusion of turn lanes at subdivision or development access points. The criteria for determining if turn lanes are needed are based on vehicle speeds, total daily traffic and the turning traffic volume during the peak hour. **Table 11** shows the maximum turn volumes in the peak hour allowed without a right turn lane, and **Table 12** shows the maximum turn volumes in the peak hour allowed without a left turn lane, per the *Pima County Subdivision and Development Street Standards.* When needed, turn lanes remove the slowing turning traffic from the through traffic stream, improving capacity and reducing rear-end accidents. **Table 13** shows the locations that were evaluated for turn lanes.

Table 11 – Maximum Peak Hour Right Turn Volume Without Right Turn Lane

Average Daily Traffic (vpd)	Turning Volume
2,500-5,000	100
5,000-10,000	70
>10,000	40

VPD - Vehicles Per Day

Table 12 – Maximum Peak Hour Left Turn Volume Without Right Turn Lane

	Average Daily Traffic (vpd)			
Posted Speed (mph)	<2,500	2,500-5,000	5,000-10,000	>10,000
< 35	75	50	30	15
40-50	75	40	20	10
> 55	75	30	10	5

VPD - Vehicles Per Day

Table 13 – Turn Lane Warrants

Intersection	Turn Treatments Warranted?	Direction	Turn Treatment Analyzed
South Driveway (Owl Head Place)/La Cholla Boulevard	No	Northbound	Right Turn Lane
North Driveway/Lambert Lane	No	Eastbound	Right Turn Lane
South Driveway (Owl Head Place)/La Cholla Boulevard	Yes	Southbound	Left Turn Lane
North Driveway/Lambert Lane	Yes	Westbound	Left Turn Lane

Based on the 2016 weekday peak hour traffic volumes with the project, **Table 13** shows that a southbound left turn lane is warranted at the intersection of South Driveway/La Cholla Boulevard. A westbound left turn lane is warranted at the intersection of North Driveway/La Cholla Boulevard.

Another key element of this study is to determine the storage length required for the warranted turn lanes.

The queue storage requirements for the area roadways were calculated using the following methods as recommended in *A Policy of Geometric Design of Highways and Streets* (AASHTO, 2011).

For un-signalized intersections, storage for vehicles likely to arrive in an average two-minute period within the peak hour should be provided.

Vehicles per 2 min. period = (vehicles/hour)÷(30 periods/hour)
Storage length = vehicles per 2 min. period x 25 feet

Based on the 2016 weekday peak hour traffic volumes with the project, the storage lengths were found for the warranted left turn lanes. The computed value is typically rounded up to the nearest 25 feet. **Table 14** shows the calculated queue length for the warranted turn lanes. Complete storage length calculations can be found in the Appendix.

Table 14 – Calculated Queue Lengths

Intersection	Left Turn Storage			
	NB	SB	EB	WB
South Driveway (Owl Head Place)/La Cholla Bouelvard				
Turning Volume (vph)		34		
$S_{calculated}$ =		28		
$S_{rounded}$ =		50		
North Driveway/Lambert Lane				
Turning Volume (vph)				20
$S_{calculated}$ =				17
$S_{rounded}$ =				25

S - storage in feet, vph - vehicles per hour

Table 14 shows that a minimum of 50 feet of vehicle storage space was calculated for vehicles making a southbound left into the project site at the South Driveway and a minimum of 25 feet of vehicle storage was calculated for vehicles making a westbound left into the project at the North Driveway.

The *Pima County Pavement Marking Standards* require a minimum turn lane storage length of 150 feet. Therefore, 150 feet is the recommended length for both left turn lanes into the project.

Conclusion

When fully completed, the proposed residential development project is predicted to generate an additional 1,564 vehicle trips per day (vtpd) on weekdays to the adjacent street system from the new project site. Fifty percent of these new trips (782 vehicle trips) will be into the project and fifty percent will be out of the project.

Both of the existing study intersections and study roadway segments currently operate at an adequate level of service (LOS) during the weekday AM and PM peak hours and are predicted to continue doing so in 2016, without traffic from the project.

All of the existing study intersections and study roadway segments are anticipated to continue operating at an adequate LOS during the weekday AM and PM peak hours in 2016, with traffic from the proposed neighborhood project.

The turn lane analysis shows that a southbound left turn lane with 150 feet of storage is warranted at the intersection of South Driveway (Owl Head Place)/La Cholla Boulevard. A westbound left turn lane with 150 of storage is warranted at the intersection of North Driveway/La Cholla Boulevard.

New STOP signs and associated STOP bar pavement markings are recommended for both northbound vehicles exiting the project through the North Driveway and westbound vehicles exiting through the south driveway.

Another improvement which should be considered is removing impediments to driver sight lines. In particular, vegetation near the northwest and southwest corners of the intersection of La Cholla Boulevard/Owl Head Place should be removed to maximize driver visibility. In addition, sight distances at the future proposed access points and internal intersections should be verified during the design process.

Proposed lane configurations and traffic control are shown in **Figure 9**.

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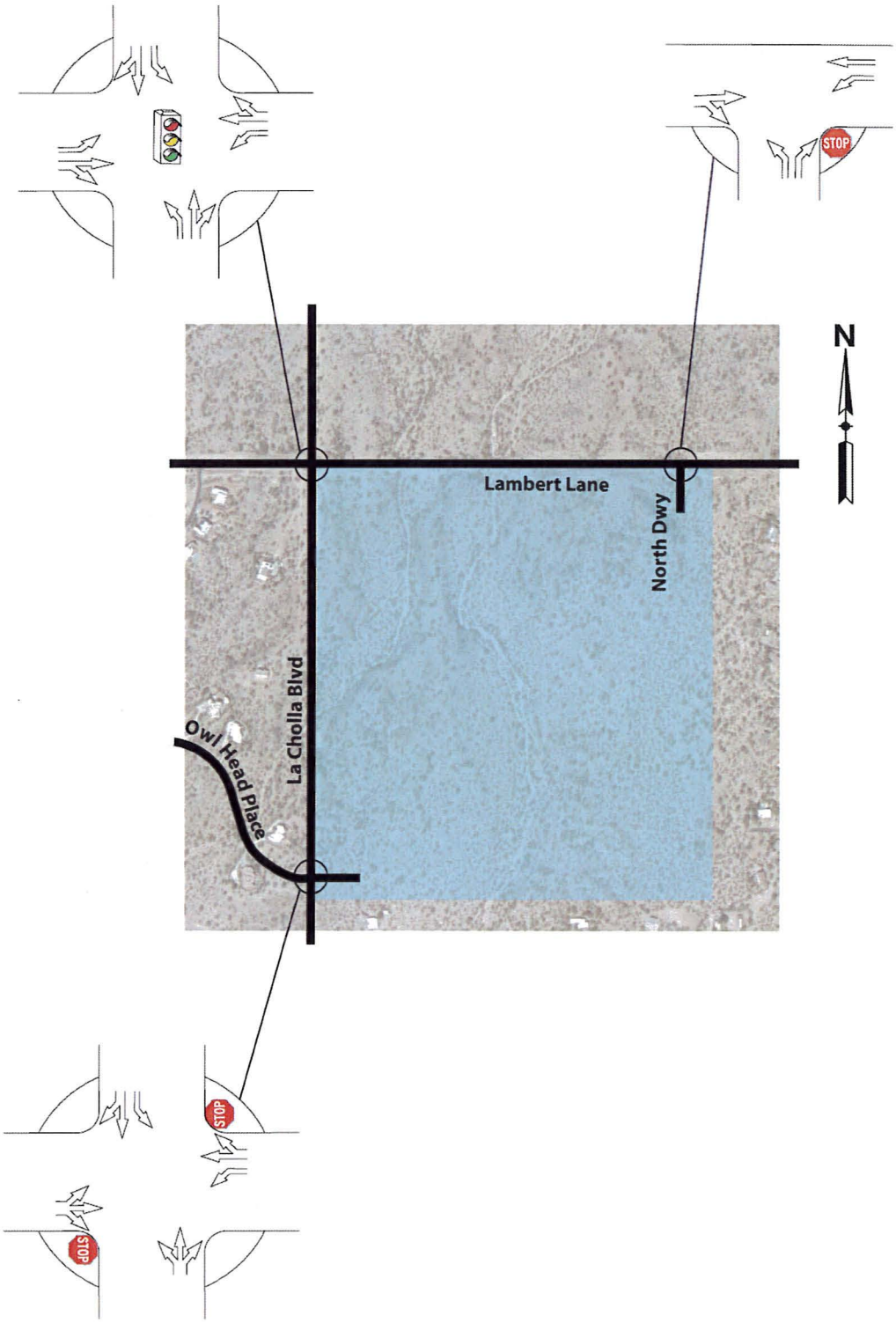
Figure 9 – Proposed Lane Configurations and Traffic Control



TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

APPENDIX

Traffic Counts

Trip Generation Calculations

Capacity Calculations

Turn Lane Analysis

TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

APPENDIX

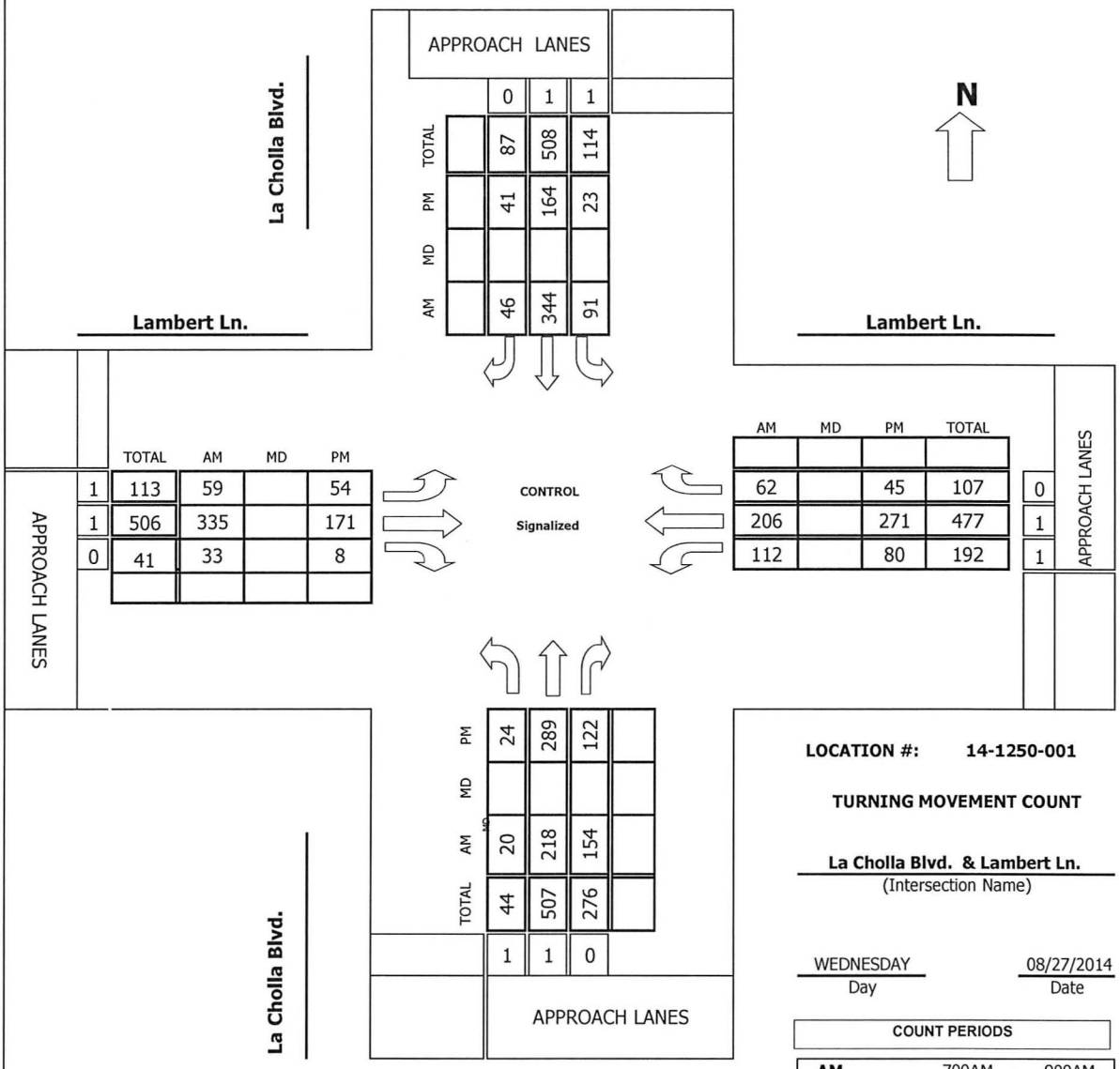
Traffic Counts

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 14-1250-001

TMC SUMMARY OF La Cholla Blvd. & Lambert Ln.



LOCATION #: 14-1250-001

TURNING MOVEMENT COUNT

La Cholla Blvd. & Lambert Ln.
(Intersection Name)

WEDNESDAY — Day
08/27/2014 — Date

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 715 AM

NOON PEAK HOUR:

PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	La Cholla Blvd.	DATE:	08/27/2014	LOCATION:	Oro Valley
E-W STREET:	Lambert Ln.	DAY:	WEDNESDAY	PROJECT#	14-1250-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	0	1	1	0	1	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	35	40	8	82	11	9	73	5	15	46	6	331
7:15 AM	0	56	35	12	60	13	22	116	5	26	44	15	404
7:30 AM	10	60	52	24	90	8	17	77	6	35	69	22	470
7:45 AM	8	67	38	33	109	15	12	64	15	30	56	17	464
8:00 AM	2	35	29	22	85	10	8	78	7	21	37	8	342
8:15 AM	4	26	20	9	67	8	2	57	2	19	28	10	252
8:30 AM	0	31	18	0	70	3	10	49	4	17	47	9	258
8:45 AM	5	31	13	8	52	7	8	32	1	16	22	6	201
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	30	341	245	116	615	75	88	546	45	179	349	93	2722
Approach %	4.87	55.36	39.77	14.39	76.30	9.31	12.96	80.41	6.63	28.82	56.20	14.98	
App/Depart	616	/	522	806	/	839	679	/	907	621	/	454	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	20	218	154	91	344	46	59	335	33	112	206	62	1680
Approach %	5.10	55.61	39.29	18.92	71.52	9.56	13.82	78.45	7.73	29.47	54.21	16.32	
PEAK HR. FACTOR:	0.803			0.766			0.747			0.754			0.894

CONTROL: Signalized
COMMENT 1:
GPS: 32.395309,-111.01293

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	La Cholla Blvd.	DATE:	08/27/2014	LOCATION:	Oro Valley
E-W STREET:	Lambert Ln.	DAY:	WEDNESDAY	PROJECT#	14-1250-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	0	1	1	0	1	1	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	5	36	24	14	43	8	13	46	2	31	87	9	318
4:15 PM	3	57	22	9	44	11	6	28	2	18	57	9	266
4:30 PM	6	62	42	7	46	7	10	42	2	22	61	9	316
4:45 PM	5	80	18	6	29	11	14	50	2	15	65	11	306
5:00 PM	4	68	32	5	48	14	17	42	1	18	69	13	331
5:15 PM	9	79	30	5	41	9	13	37	3	25	76	12	339
5:30 PM	1	61	29	3	21	7	9	48	1	17	58	12	267
5:45 PM	6	74	27	17	31	13	11	39	6	20	37	12	293
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	39	517	224	66	303	80	93	332	19	166	510	87	2436
Approach %	5.00	66.28	28.72	14.70	67.48	17.82	20.95	74.77	4.28	21.76	66.84	11.40	
App/Depart	780	/	697	449	/	488	444	/	622	763	/	629	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	24	289	122	23	164	41	54	171	8	80	271	45	1292
Approach %	5.52	66.44	28.05	10.09	71.93	17.98	23.18	73.39	3.43	20.20	68.43	11.36	
PEAK HR. FACTOR:		0.922			0.851			0.883			0.876		0.953

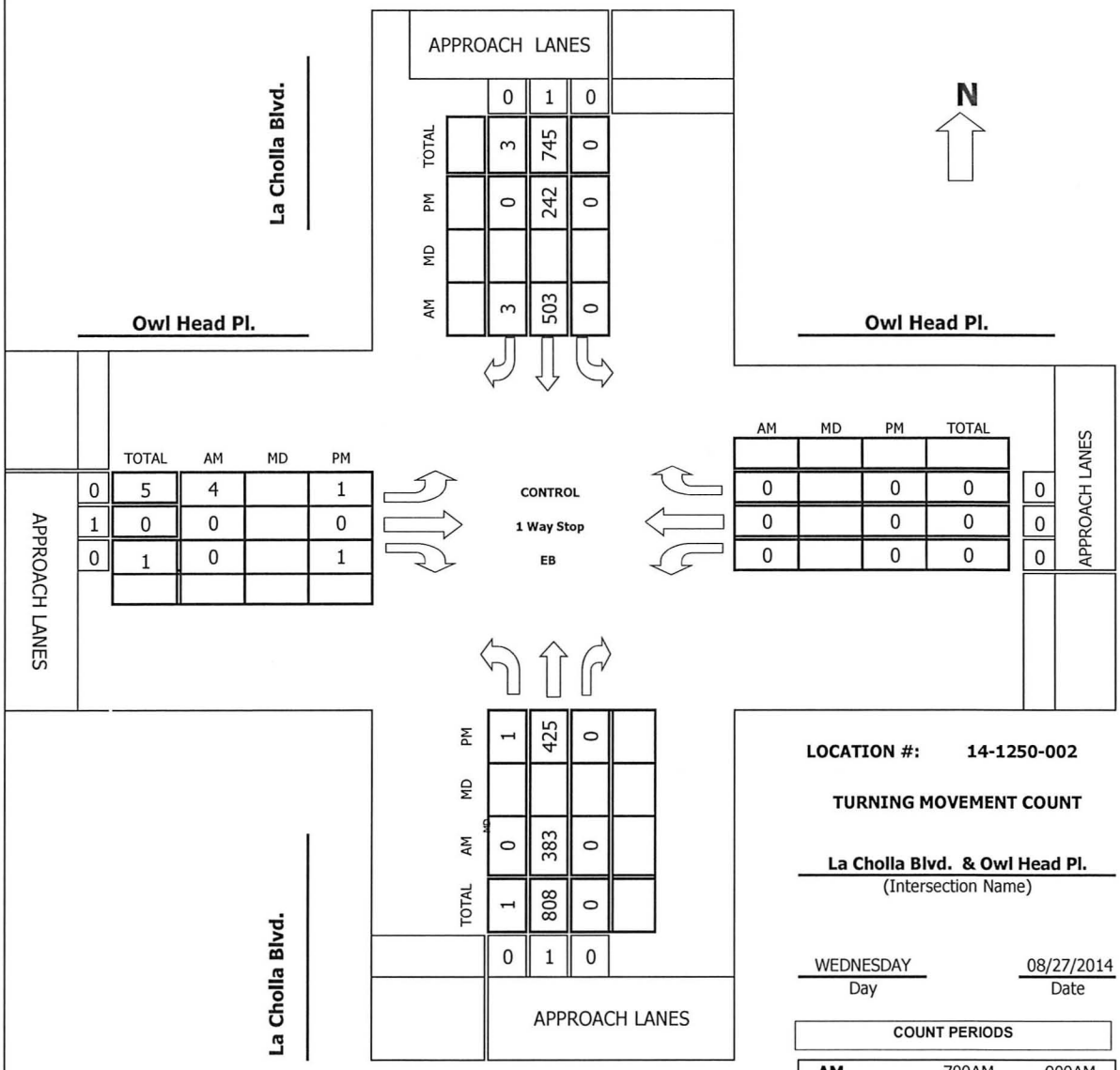
CONTROL:	Signalized
COMMENT 1:	0
GPS:	32.395309,-111.01293

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 14-1250-002

TMC SUMMARY OF La Cholla Blvd. & Owl Head Pl.



LOCATION #: 14-1250-002

TURNING MOVEMENT COUNT

La Cholla Blvd. & Owl Head Pl.
(Intersection Name)

WEDNESDAY — Day
08/27/2014 — Date

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 715 AM

NOON PEAK HOUR:

PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	La Cholla Blvd.	DATE:	08/27/2014	LOCATION:	Oro Valley
E-W STREET:	Owl Head Pl.	DAY:	WEDNESDAY	PROJECT#	14-1250-002

	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	73	0	0	120	0	1	0	0	0	0	0	194
7:15 AM	0	89	0	0	111	1	0	0	0	0	0	0	201
7:30 AM	0	139	0	0	127	0	4	0	0	0	0	0	270
7:45 AM	0	96	0	0	130	0	0	0	0	0	0	0	226
8:00 AM	0	59	0	0	135	2	0	0	0	0	0	0	196
8:15 AM	0	56	0	0	86	0	0	0	0	0	0	0	142
8:30 AM	0	66	0	0	83	0	0	0	1	0	0	0	150
8:45 AM	0	49	0	0	73	0	0	0	0	0	0	0	122
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	627	0	0	865	3	5	0	1	0	0	0	1501
Approach %	0.00	100.00	0.00	0.00	99.65	0.35	83.33	0.00	16.67	####	####	####	
App/Depart	627	/	632	868	/	866	6	/	0	0	/	3	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	0	383	0	0	503	3	4	0	0	0	0	0	893
Approach %	0.00	100.00	0.00	0.00	99.41	0.59	100.00	0.00	0.00	####	####	####	
PEAK HR. FACTOR:	0.689			0.923			0.250			0.000			0.827

CONTROL: 1 Way Stop (EB)
COMMENT 1:
GPS: 32.388623,-111.012865

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	La Cholla Blvd.	DATE:	08/27/2014	LOCATION:	Oro Valley
E-W STREET:	Owl Head Pl.	DAY:	WEDNESDAY	PROJECT#	14-1250-002

	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	65	0	0	83	0	0	0	2	0	0	0	150
4:15 PM	0	84	0	0	60	2	0	0	0	0	0	0	146
4:30 PM	0	109	0	0	65	0	1	0	0	0	0	0	175
4:45 PM	0	102	0	0	44	0	0	0	0	0	0	0	146
5:00 PM	0	113	0	0	68	0	0	0	1	0	0	0	182
5:15 PM	1	101	0	0	65	0	0	0	0	0	0	0	167
5:30 PM	0	92	0	0	34	0	0	0	0	0	0	0	126
5:45 PM	0	105	0	0	54	0	0	0	0	0	0	0	159
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	1	771	0	0	473	2	1	0	3	0	0	0	1251
Approach %	0.13	99.87	0.00	0.00	99.58	0.42	25.00	0.00	75.00	####	####	####	
App/Depart	772	/	772	475	/	476	4	/	0	0	/	3	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	1	425	0	0	242	0	1	0	1	0	0	0	670
Approach %	0.23	99.77	0.00	0.00	100.00	0.00	50.00	0.00	50.00	####	####	####	
PEAK HR. FACTOR:	0.942			0.890			0.500			0.000			0.920

CONTROL: 1 Way Stop (EB)
COMMENT 1: 0
GPS: 32.388623,-111.012865

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

Volumes for: Wednesday, August 27, 2014 City: Oro Valley Project #: 14-1250-002

Location: La Cholla Blvd. south of Lambert Ln.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	3		3					12:00	59		70				
00:15	1		1					12:15	75		109				
00:30	2		0					12:30	91		90				
00:45	2	8	1	5			13	12:45	67	292	71	340			632
01:00	0		1					13:00	73		82				
01:15	2		0					13:15	81		74				
01:30	0		1					13:30	62		90				
01:45	1	3	0	2			5	13:45	68	284	101	347			631
02:00	1		0					14:00	79		66				
02:15	1		1					14:15	82		84				
02:30	4		2					14:30	104		79				
02:45	2	8	2	5			13	14:45	112	377	94	323			700
03:00	1		1					15:00	103		84				
03:15	3		2					15:15	92		79				
03:30	0		0					15:30	87		78				
03:45	0	4	2	5			9	15:45	54	336	84	325			661
04:00	8		5					16:00	83		66				
04:15	15		10					16:15	95		62				
04:30	9		24					16:30	110		56				
04:45	7	39	18	57			96	16:45	97	385	65	249			634
05:00	20		15					17:00	113		71				
05:15	18		33					17:15	95		40				
05:30	34		32					17:30	108		58				
05:45	30	102	38	118			220	17:45	82	398	46	215			613
06:00	42		39					18:00	62		46				
06:15	49		61					18:15	71		32				
06:30	58		73					18:30	60		40				
06:45	56	205	92	265			470	18:45	56	249	26	144			393
07:00	92		122					19:00	37		22				
07:15	110		132					19:15	35		19				
07:30	121		118					19:30	35		11				
07:45	78	401	154	526			927	19:45	37	144	19	71			215
08:00	59		84					20:00	26		24				
08:15	53		103					20:15	25		20				
08:30	61		65					20:30	31		13				
08:45	49	222	71	323			545	20:45	28	110	15	72			182
09:00	52		71					21:00	14		15				
09:15	58		79					21:15	19		15				
09:30	57		62					21:30	18		7				
09:45	49	216	72	284			500	21:45	11	62	12	49			111
10:00	49		64					22:00	10		6				
10:15	68		62					22:15	8		8				
10:30	77		68					22:30	10		8				
10:45	73	267	69	263			530	22:45	8	36	4	26			62
11:00	59		70					23:00	6		2				
11:15	66		76					23:15	4		2				
11:30	80		55					23:30	3		1				
11:45	87	292	55	256			548	23:45	1	14	5	10			24
Total Vol.		1767		2109			**3876**			2687		2171			**4858**

GPS Coordinates:

Daily Totals

NB	SB	EB	WB	Combined
4454	4280			**8734**

	AM			PM		
Split %	45.6%	54.4%	**44.4%**	55.3%	44.7%	**55.6%**
Peak Hour	07:00	07:00	**07:00**	16:15	12:15	**14:30**
Volume	401	526	**927**	415	352	**747**
P.H.F.	0.83	0.85	**0.96**	0.92	0.81	**0.91**

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

Volumes for: Wednesday, August 27, 2014 City: Oro Valley Project #: 14-1250-001

Location: Lambert Ln. east of La Cholla Blvd.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			4		2			12:00			59		60		
00:15			2		0			12:15			75		66		
00:30			3		1			12:30			72		60		
00:45			2	11	2	5	16	12:45			71	277	51	237	514
01:00			1		3			13:00			63		78		
01:15			2		0			13:15			66		82		
01:30			3		0			13:30			76		81		
01:45			0	6	2	5	11	13:45			61	266	94	335	601
02:00			2		2			14:00			70		70		
02:15			0		2			14:15			90		78		
02:30			3		1			14:30			114		88		
02:45			3	8	0	5	13	14:45			113	387	91	327	714
03:00			0		2			15:00			108		110		
03:15			1		0			15:15			91		104		
03:30			2		0			15:30			97		107		
03:45			1	4	1	3	7	15:45			83	379	118	439	818
04:00			11		3			16:00			80		101		
04:15			9		3			16:15			65		93		
04:30			22		14			16:30			85		83		
04:45			11	53	5	25	78	16:45			76	306	109	386	692
05:00			18		6			17:00			82		109		
05:15			34		19			17:15			78		102		
05:30			45		22			17:30			89		81		
05:45			33	130	26	73	203	17:45			71	320	70	362	682
06:00			55		28			18:00			65		76		
06:15			71		30			18:15			59		54		
06:30			93		56			18:30			55		57		
06:45			82	301	54	168	469	18:45			45	224	61	248	472
07:00			145		79			19:00			53		55		
07:15			126		121			19:15			46		33		
07:30			202		133			19:30			39		42		
07:45			152	625	100	433	1058	19:45			29	167	46	176	343
08:00			98		62			20:00			33		51		
08:15			84		43			20:15			25		39		
08:30			78		39			20:30			30		26		
08:45			39	299	55	199	498	20:45			27	115	36	152	267
09:00			69		47			21:00			11		30		
09:15			57		41			21:15			14		39		
09:30			67		50			21:30			21		25		
09:45			60	253	65	203	456	21:45			13	59	14	108	167
10:00			58		66			22:00			10		10		
10:15			62		50			22:15			6		8		
10:30			61		54			22:30			12		10		
10:45			67	248	50	220	468	22:45			11	39	7	35	74
11:00			63		51			23:00			10		11		
11:15			59		51			23:15			2		6		
11:30			72		65			23:30			3		3		
11:45			58	252	62	229	481	23:45			4	19	8	28	47
Total Vol.				2190		1568	**3758**					2558		2833	**5391**

GPS Coordinates:

Daily Totals	NB	SB	EB	WB	Combined
			4748	4401	**9149**

	AM			PM		
Split %	58.3%	41.7%	**41.1%**	47.4%	52.6%	**58.9%**
Peak Hour	07:00	07:00	**07:00**	14:30	15:00	**14:45**
Volume	625	433	**1058**	426	439	**821**
P.H.F.	0.77	0.81	**0.79**	0.93	0.93	**0.94**

TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

APPENDIX

Trip Generation Calculations

Single-Family Detached Housing

LAND USE: 154 Dwelling Units Single-Family Detached Housing

TRIP GENERATION CALCULATIONS ARE BASED ON THE INSTITUTE OF TRANSPORTATION ENGINEERS' TRIP GENERATION, 9TH EDITION. THE ITE LAND USE CODE IS Single-Family Detached Housing (210)

WEEKDAY

Rate Based on Equation: Ln(T) = 0.92Ln(X) + 2.72

Rate = 10.15 Trips per Dwelling Unit (DU)

T = 10.15 Trips x 154 DU

T = 1564 VPD

ENTER: (0.5)*(1564) = **782 VPD**

EXIT: (0.5)*(1564) = **782 VPD**

AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)

Rate Based on Equation: T = 0.70 (X) + 9.74

Rate = 0.76 Trips per Dwelling Unit (DU)

T = 0.76 Trips x 154 DU

T = 119 VPH

ENTER: (0.25)*(119) = **30 VPH**

EXIT: (0.75)*(119) = **89 VPH**

PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)

Rate Based on Equation: Ln(T) = 0.90Ln(X) + 0.51

Rate = 1.01 Trips per Dwelling Unit (DU)

T = 1.01 Trips x 154 DU

T = 155 VPH

ENTER: (0.63)*(155) = **98 VPH**

EXIT: (0.37)*(155) = **57 VPH**

*where, T = trip ends

TRIP GENERATION SUMMARY

WEEKDAY	**1564 VPD**
AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)	**119 VPH**
PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)	**155 VPH**

TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

APPENDIX

Capacity Calculations

HCM 2010 Signalized Intersection Summary
3: La Cholla Boulevard & Lambert Lane

9/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	335	33	112	206	65	20	218	154	91	349	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	66	372	37	124	229	72	22	242	171	101	388	51
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	464	698	69	386	569	179	371	432	305	379	684	90
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1074	1668	166	973	1360	428	946	1017	719	969	1613	212
Grp Volume(v), veh/h	66	0	409	124	0	301	22	0	413	101	0	439
Grp Sat Flow(s),veh/h/ln	1074	0	1833	973	0	1787	946	0	1736	969	0	1825
Q Serve(g_s), s	2.3	0.0	8.5	5.6	0.0	6.0	0.9	0.0	9.1	4.5	0.0	9.3
Cycle Q Clear(g_c), s	8.3	0.0	8.5	14.1	0.0	6.0	10.2	0.0	9.1	13.6	0.0	9.3
Prop In Lane	1.00		0.09	1.00		0.24	1.00		0.41	1.00		0.12
Lane Grp Cap(c), veh/h	464	0	767	386	0	748	371	0	736	379	0	774
V/C Ratio(X)	0.14	0.00	0.53	0.32	0.00	0.40	0.06	0.00	0.56	0.27	0.00	0.57
Avail Cap(c_a), veh/h	902	0	1515	783	0	1477	714	0	1366	730	0	1436
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	11.1	16.3	0.0	10.3	15.0	0.0	11.1	16.2	0.0	11.1
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.5	0.0	0.3	0.1	0.0	0.7	0.4	0.0	0.7
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	0.7	0.0	4.3	1.5	0.0	3.0	0.2	0.0	4.5	1.2	0.0	4.8
LnGrp Delay(d),s/veh	13.4	0.0	11.6	16.8	0.0	10.7	15.0	0.0	11.7	16.6	0.0	11.7
LnGrp LOS	B		B	B		B	B		B	B		B
Approach Vol, veh/h		475			425			435			540	
Approach Delay, s/veh		11.9			12.5			11.9			12.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.6		25.3		25.6		25.3
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		40.0		42.0		40.0		42.0
Max Q Clear Time (g_c+I1), s		12.2		10.5		15.6		16.1
Green Ext Time (p_c), s		6.2		5.4		6.0		5.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	4	0	0	383	503	3
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	0	0	426	559	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	987	561	562	0	-	0
Stage 1	561	-	-	-	-	-
Stage 2	426	-	-	-	-	-
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	274	527	1009	-	-	-
Stage 1	571	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	527	1009	-	-	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	571	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1009	-	274	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	0	-	18.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 Signalized Intersection Summary
3: La Cholla Boulevard & Lambert Lane

9/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	171	8	80	271	45	24	289	122	23	164	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	60	190	9	89	301	50	27	321	136	26	182	46
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	420	644	30	542	568	94	575	510	216	393	590	149
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	1026	1764	84	1179	1558	259	1148	1243	527	931	1436	363
Grp Volume(v), veh/h	60	0	199	89	0	351	27	0	457	26	0	228
Grp Sat Flow(s),veh/h/ln	1026	0	1848	1179	0	1817	1148	0	1770	931	0	1799
Q Serve(g_s), s	1.7	0.0	2.7	2.1	0.0	5.4	0.6	0.0	7.3	0.8	0.0	3.0
Cycle Q Clear(g_c), s	7.2	0.0	2.7	4.8	0.0	5.4	3.6	0.0	7.3	8.1	0.0	3.0
Prop In Lane	1.00		0.05	1.00		0.14	1.00		0.30	1.00		0.20
Lane Grp Cap(c), veh/h	420	0	674	542	0	663	575	0	727	393	0	739
V/C Ratio(X)	0.14	0.00	0.30	0.16	0.00	0.53	0.05	0.00	0.63	0.07	0.00	0.31
Avail Cap(c_a), veh/h	1256	0	2179	1502	0	2143	1393	0	1988	1056	0	2020
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.7	0.0	8.1	9.8	0.0	8.9	8.3	0.0	8.3	11.6	0.0	7.1
Incr Delay (d2), s/veh	0.2	0.0	0.2	0.1	0.0	0.7	0.0	0.0	0.9	0.1	0.0	0.2
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	0.5	0.0	1.4	0.7	0.0	2.8	0.2	0.0	3.6	0.2	0.0	1.5
LnGrp Delay(d),s/veh	11.9	0.0	8.3	9.9	0.0	9.6	8.3	0.0	9.2	11.6	0.0	7.3
LnGrp LOS	B		A	A		A	A		A	B		A
Approach Vol, veh/h		259			440			484			254	
Approach Delay, s/veh		9.1			9.6			9.2			7.8	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		18.6		17.0		18.6		17.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		40.0		42.0		40.0		42.0
Max Q Clear Time (g_c+I1), s		9.3		9.2		10.1		7.4
Green Ext Time (p_c), s		4.5		3.8		4.5		3.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	1	1	425	242	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	1	1	472	269	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	743	269	269	0	-	0
Stage 1	269	-	-	-	-	-
Stage 2	474	-	-	-	-	-
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	383	770	1295	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	383	770	1295	-	-	-
Mov Cap-2 Maneuver	383	-	-	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1295	-	512	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	7.8	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 Signalized Intersection Summary
3: La Cholla Boulevard & Lambert Lane

9/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	62	349	35	117	215	68	21	227	161	95	358	48
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	69	388	39	130	239	76	23	252	179	106	398	53
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	451	710	71	371	578	184	357	436	310	360	692	92
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	1060	1666	167	957	1356	431	936	1015	721	953	1610	214
Grp Volume(v), veh/h	69	0	427	130	0	315	23	0	431	106	0	451
Grp Sat Flow(s),veh/h/ln	1060	0	1833	957	0	1787	936	0	1736	953	0	1825
Q Serve(g_s), s	2.7	0.0	9.7	6.5	0.0	6.8	1.1	0.0	10.4	5.3	0.0	10.4
Cycle Q Clear(g_c), s	9.5	0.0	9.7	16.2	0.0	6.8	11.4	0.0	10.4	15.7	0.0	10.4
Prop In Lane	1.00		0.09	1.00		0.24	1.00		0.42	1.00		0.12
Lane Grp Cap(c), veh/h	451	0	781	371	0	761	357	0	745	360	0	784
V/C Ratio(X)	0.15	0.00	0.55	0.35	0.00	0.41	0.06	0.00	0.58	0.29	0.00	0.58
Avail Cap(c_a), veh/h	804	0	1390	689	0	1355	630	0	1253	639	0	1318
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	0.0	11.9	17.9	0.0	11.1	16.3	0.0	12.0	18.0	0.0	12.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.6	0.0	0.4	0.1	0.0	0.7	0.5	0.0	0.7
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	0.8	0.0	5.0	1.8	0.0	3.4	0.3	0.0	5.1	1.4	0.0	5.3
LnGrp Delay(d),s/veh	14.5	0.0	12.5	18.5	0.0	11.4	16.4	0.0	12.7	18.4	0.0	12.6
LnGrp LOS	B		B	B		B	B		B	B		B
Approach Vol, veh/h		496			445			454			557	
Approach Delay, s/veh		12.8			13.5			12.9			13.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.8		27.6		27.8		27.6
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		40.0		42.0		40.0		42.0
Max Q Clear Time (g_c+I1), s		13.4		11.7		17.7		18.2
Green Ext Time (p_c), s		6.4		5.7		6.1		5.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	5	0	0	399	524	4
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	0	0	443	582	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1027	584	587	0	-	0
Stage 1	584	-	-	-	-	-
Stage 2	443	-	-	-	-	-
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	260	512	988	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	260	512	988	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	647	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	988	-	260	-	-
HCM Lane V/C Ratio	-	-	0.021	-	-
HCM Control Delay (s)	0	-	19.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 2010 Signalized Intersection Summary
3: La Cholla Boulevard & Lambert Lane

9/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	178	9	84	282	47	25	301	127	24	171	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	63	198	10	93	313	52	28	334	141	27	190	48
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	652	33	531	578	96	564	519	219	377	598	151
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1013	1758	89	1169	1558	259	1138	1245	525	915	1436	363
Grp Volume(v), veh/h	63	0	208	93	0	365	28	0	475	27	0	238
Grp Sat Flow(s),veh/h/ln	1013	0	1847	1169	0	1817	1138	0	1770	915	0	1799
Q Serve(g_s), s	2.0	0.0	3.0	2.3	0.0	6.0	0.6	0.0	8.1	0.9	0.0	3.3
Cycle Q Clear(g_c), s	7.9	0.0	3.0	5.3	0.0	6.0	4.0	0.0	8.1	9.0	0.0	3.3
Prop In Lane	1.00		0.05	1.00		0.14	1.00		0.30	1.00		0.20
Lane Grp Cap(c), veh/h	407	0	685	531	0	674	564	0	737	377	0	749
V/C Ratio(X)	0.15	0.00	0.30	0.17	0.00	0.54	0.05	0.00	0.64	0.07	0.00	0.32
Avail Cap(c_a), veh/h	1161	0	2061	1402	0	2027	1299	0	1881	968	0	1911
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.4	0.0	8.4	10.3	0.0	9.3	8.7	0.0	8.8	12.3	0.0	7.4
Incr Delay (d2), s/veh	0.2	0.0	0.2	0.2	0.0	0.7	0.0	0.0	0.9	0.1	0.0	0.2
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	0.6	0.0	1.5	0.7	0.0	3.1	0.2	0.0	4.0	0.2	0.0	1.7
LnGrp Delay(d),s/veh	12.6	0.0	8.6	10.4	0.0	10.0	8.8	0.0	9.7	12.4	0.0	7.6
LnGrp LOS	B		A	B		B	A		A	B		A
Approach Vol, veh/h		271			458			503			265	
Approach Delay, s/veh		9.6			10.1			9.7			8.1	
Approach LOS		A			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		19.7		18.0		19.7		18.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		40.0		42.0		40.0		42.0
Max Q Clear Time (g_c+I1), s		10.1		9.9		11.0		8.0
Green Ext Time (p_c), s		4.7		4.0		4.7		4.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	2	2	2	443	252	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	2	492	280	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	777	280	280	0	-	0
Stage 1	280	-	-	-	-	-
Stage 2	497	-	-	-	-	-
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	365	759	1283	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	364	759	1283	-	-	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	610	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1283	-	492	-	-
HCM Lane V/C Ratio	0.002	-	0.009	-	-
HCM Control Delay (s)	7.8	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 Signalized Intersection Summary
3: La Cholla Boulevard & Lambert Lane

9/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	62	352	38	136	224	73	30	231	183	97	359	48
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	69	391	42	151	249	81	33	257	203	108	399	53
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	437	719	77	364	586	191	350	421	332	331	702	93
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	1046	1654	178	951	1347	438	935	966	763	928	1611	214
Grp Volume(v), veh/h	69	0	433	151	0	330	33	0	460	108	0	452
Grp Sat Flow(s),veh/h/ln	1046	0	1831	951	0	1785	935	0	1728	928	0	1825
Q Serve(g_s), s	3.0	0.0	10.9	8.7	0.0	7.9	1.7	0.0	12.7	6.3	0.0	11.5
Cycle Q Clear(g_c), s	11.0	0.0	10.9	19.5	0.0	7.9	13.2	0.0	12.7	19.0	0.0	11.5
Prop In Lane	1.00		0.10	1.00		0.25	1.00		0.44	1.00		0.12
Lane Grp Cap(c), veh/h	437	0	797	364	0	777	350	0	753	331	0	796
V/C Ratio(X)	0.16	0.00	0.54	0.42	0.00	0.42	0.09	0.00	0.61	0.33	0.00	0.57
Avail Cap(c_a), veh/h	690	0	1240	594	0	1209	545	0	1114	525	0	1177
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	13.0	20.2	0.0	12.1	18.1	0.0	13.4	20.7	0.0	13.1
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.8	0.0	0.4	0.1	0.0	0.8	0.6	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	0.9	0.0	5.5	2.3	0.0	3.9	0.5	0.0	6.2	1.6	0.0	5.9
LnGrp Delay(d),s/veh	16.1	0.0	13.5	20.9	0.0	12.5	18.2	0.0	14.3	21.3	0.0	13.8
LnGrp LOS	B		B	C		B	B		B	C		B
Approach Vol, veh/h		502			481			493			560	
Approach Delay, s/veh		13.9			15.2			14.5			15.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		31.0		31.0		31.0		31.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		40.0		42.0		40.0		42.0
Max Q Clear Time (g_c+I1), s		15.2		13.0		21.0		21.5
Green Ext Time (p_c), s		6.7		6.0		6.1		5.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	5	0	0	13	0	31	0	403	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	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	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	0	14	0	34	0	448	6

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1089	1074	599	1072	1074	451	601	0	0
Stage 1	621	621	-	451	451	-	-	-	-
Stage 2	468	453	-	621	623	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	193	220	502	198	220	608	976	-	-
Stage 1	475	479	-	588	571	-	-	-	-
Stage 2	575	570	-	475	478	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	180	217	502	196	217	608	976	-	-
Mov Cap-2 Maneuver	180	217	-	196	217	-	-	-	-
Stage 1	475	472	-	588	571	-	-	-	-
Stage 2	542	570	-	468	471	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	25.6	15.3	0
HCM LOS	D	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	976	-	-	180	196	608	1108	-	-
HCM Lane V/C Ratio	-	-	-	0.031	0.074	0.057	0.01	-	-
HCM Control Delay (s)	0	-	-	25.6	24.8	11.3	8.3	0	-
HCM Lane LOS	A	-	-	D	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	10	537	4
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	90	90	90
Heavy Vehicles, %	2	2	2
Mvmt Flow	11	597	4

Major/Minor	Major2		
Conflicting Flow All	453	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1108	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1108	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.2
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	623	9	6	6	27	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	692	10	7	7	30	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	702	0	717	697
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	20	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	895	-	396	441
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	1003	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	895	-	393	441
Mov Cap-2 Maneuver	-	-	-	-	393	-
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	995	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.5	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	393	441	-	-	895	-
HCM Lane V/C Ratio	0.076	0.045	-	-	0.007	-
HCM Control Delay (s)	14.9	13.6	-	-	9.1	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

HCM 2010 Signalized Intersection Summary
3: La Cholla Boulevard & Lambert Lane

9/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	187	18	112	288	50	31	304	153	29	176	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	63	208	20	124	320	56	34	338	170	32	196	48
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	385	624	60	501	576	101	564	506	255	354	625	153
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	1003	1673	161	1148	1545	270	1131	1170	589	888	1446	354
Grp Volume(v), veh/h	63	0	228	124	0	376	34	0	508	32	0	244
Grp Sat Flow(s),veh/h/ln	1003	0	1834	1148	0	1815	1131	0	1759	888	0	1800
Q Serve(g_s), s	2.2	0.0	3.7	3.6	0.0	6.7	0.8	0.0	9.5	1.2	0.0	3.7
Cycle Q Clear(g_c), s	8.9	0.0	3.7	7.2	0.0	6.7	4.5	0.0	9.5	10.7	0.0	3.7
Prop In Lane	1.00		0.09	1.00		0.15	1.00		0.33	1.00		0.20
Lane Grp Cap(c), veh/h	385	0	684	501	0	677	564	0	761	354	0	778
V/C Ratio(X)	0.16	0.00	0.33	0.25	0.00	0.56	0.06	0.00	0.67	0.09	0.00	0.31
Avail Cap(c_a), veh/h	1035	0	1874	1246	0	1854	1175	0	1711	834	0	1752
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	9.2	11.8	0.0	10.2	9.1	0.0	9.3	13.6	0.0	7.7
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.3	0.0	0.7	0.0	0.0	1.0	0.1	0.0	0.2
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	0.6	0.0	1.9	1.1	0.0	3.5	0.3	0.0	4.7	0.3	0.0	1.8
LnGrp Delay(d),s/veh	13.9	0.0	9.5	12.1	0.0	10.9	9.2	0.0	10.3	13.7	0.0	7.9
LnGrp LOS	B		A	B		B	A		B	B		A
Approach Vol, veh/h		291			500			542			276	
Approach Delay, s/veh		10.5			11.2			10.3			8.6	
Approach LOS		B			B			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		21.8		19.3		21.8		19.3
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		40.0		42.0		40.0		42.0
Max Q Clear Time (g_c+I1), s		11.5		10.9		12.7		9.2
Green Ext Time (p_c), s		5.1		4.4		5.1		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	2	0	2	8	0	20	2	458	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	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	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	2	9	0	22	2	509	17

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	897	894	289	888	886	517	289	0	0
Stage 1	364	364	-	522	522	-	-	-	-
Stage 2	533	530	-	366	364	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	261	280	750	264	284	558	1273	-	-
Stage 1	655	624	-	538	531	-	-	-	-
Stage 2	531	527	-	653	624	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	242	267	750	254	271	558	1273	-	-
Mov Cap-2 Maneuver	242	267	-	254	271	-	-	-	-
Stage 1	654	597	-	537	530	-	-	-	-
Stage 2	509	526	-	623	597	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	15	14	0
HCM LOS	C	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1273	-	-	366	254	558	1041	-	-
HCM Lane V/C Ratio	0.002	-	-	0.012	0.035	0.04	0.036	-	-
HCM Control Delay (s)	7.8	0	-	15	19.7	11.7	8.6	0	-
HCM Lane LOS	A	A	-	C	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	0.1	-	-

Intersection			
Int Delay, s/veh			

Movement	SBL	SBT	SBR
Vol, veh/h	34	260	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	90	90	90
Heavy Vehicles, %	2	2	2
Mvmt Flow	38	289	0

Major/Minor	Major2		
Conflicting Flow All	526	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1041	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1041	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	340	29	20	20	17	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	378	32	22	22	19	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	410	0	461	394
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	67	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1149	-	559	655
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	956	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1149	-	548	655
Mov Cap-2 Maneuver	-	-	-	-	548	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	938	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.1	11.3
HCM LOS			B

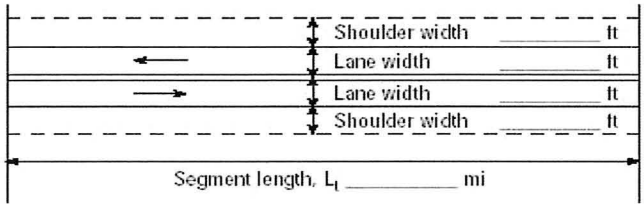
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	548	655	-	-	1149	-
HCM Lane V/C Ratio	0.034	0.02	-	-	0.019	-
HCM Control Delay (s)	11.8	10.6	-	-	8.2	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1	-

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (westbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - existing

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *383*veh/h

Opposing direction vol., V_o *580*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.956*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.91*	*0.97*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*495*	*695*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.6 mi/h*
		Percent free flow speed, PFFS	*77.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.92*	*0.98*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*474*	*658*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*56.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.29*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1603*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1666*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*77.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*425.6*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.45*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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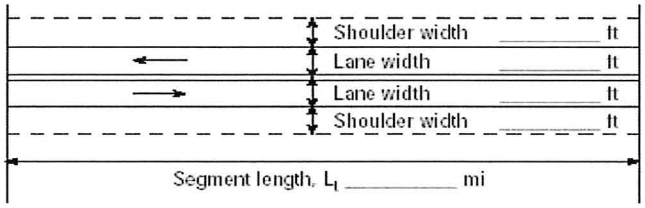
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (westbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - existing

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *396*veh/h

Opposing direction vol., V_o *316*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.940*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.92*	*0.87*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*506*	*429*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*34.1 mi/h*
		Percent free flow speed, PFFS	*80.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*0.965*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.92*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*490*	*413*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*57.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.30*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1454*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1511*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*440.0*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.47*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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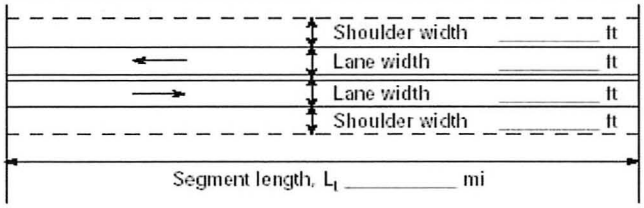
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Gutknecht*	Highway / Direction of Travel	*Lambert Lane (westbound)*
Agency or Company	*SWTE*	From/To	
Date Performed	*9/12/2014*	Jurisdiction	
Analysis Time Period		Analysis Year	*AM Peak Hour - 2016 without*

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *400*veh/h

Opposing direction vol., V_o *605*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.962*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.92*	*0.98*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*511*	*713*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.3 mi/h*
		Percent free flow speed, PFFS	*76.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.93*	*0.98*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*489*	*686*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*52.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*58.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.30*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1603*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1683*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*76.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*444.4*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.48*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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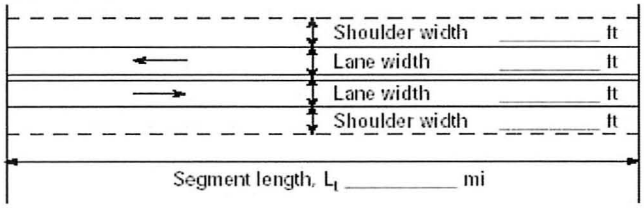
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (westbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 without

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *413*veh/h

Opposing direction vol., V_o *329*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.940*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.93*	*0.88*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*522*	*442*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*33.9 mi/h*
		Percent free flow speed, PFFS	*80.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*0.965*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.94*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*500*	*430*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*50.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*58.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.31*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1462*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1527*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*458.9*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.49*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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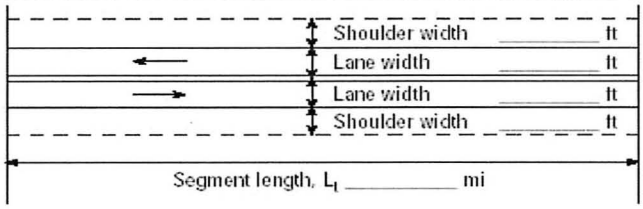
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (westbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - 2016 with

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *406*veh/h

Opposing direction vol., V_o *623*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.962*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.93*	*0.98*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*513*	*734*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.1 mi/h*
		Percent free flow speed, PFFS	*76.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.93*	*0.99*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*497*	*699*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*59.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.30*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1603*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1683*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*76.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*451.1*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.48*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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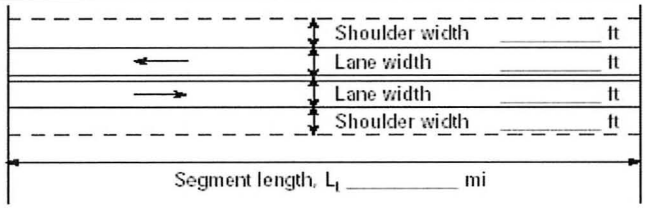
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (westbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 with

Project Description: Lambert Lane East of La Cholla

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.90

No-passing zone 0%

% Trucks and Buses , P_T 6 %

% Recreational vehicles, P_R 4%

Access points mi 1/mi

Analysis direction vol., V_d 433veh/h

Opposing direction vol., V_o 340veh/h

Shoulder width ft 2.0

Lane Width ft 12.0

Segment Length mi 0.5

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.8	2.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.951	0.940
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.94	0.88
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	538	457

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	45.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.8 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	42.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	33.7 mi/h
		Percent free flow speed, PFFS	79.9 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.4	1.6
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.977	0.965
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.95	0.89
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	519	440
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	51.3	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	13.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	58.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.32

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1478*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1527*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*481.1*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.52*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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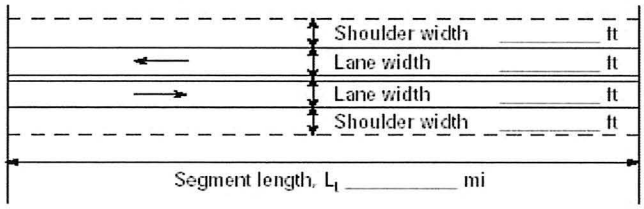
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (eastbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - existing

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.90

No-passing zone 0%

% Trucks and Buses , P_T 6 %

% Recreational vehicles, P_R 4%

Access points *mi* 1/mi

Analysis direction vol., V_d 580veh/h

Opposing direction vol., V_o 383veh/h

Shoulder width ft 2.0

Lane Width ft 12.0

Segment Length mi 0.5

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.7	1.9
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.956	0.945
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.97	0.91
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	695	495

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	45.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.7 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	42.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	32.3 mi/h
		Percent free flow speed, PFFS	76.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.4
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	0.977
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.98	0.92
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	658	474
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	59.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	12.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	67.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.41

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1510*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1561*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*76.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*644.4*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.66*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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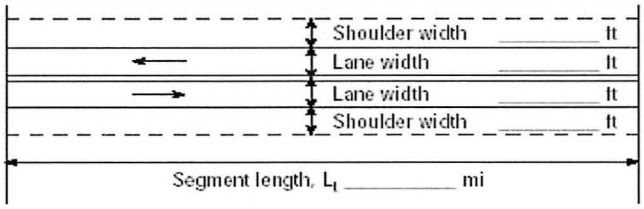
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (eastbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - existing

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *316*veh/h

Opposing direction vol., V_o *396*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	2.0	1.9
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.940	0.945
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.87	0.92
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	429	506

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	45.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.6 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	42.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	34.3 mi/h
		Percent free flow speed, PFFS	81.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.6	1.4
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.965	0.977
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.88	0.92
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	413	490
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	45.5	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	14.2	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	52.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.25

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1520*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1577*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*351.1*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.36*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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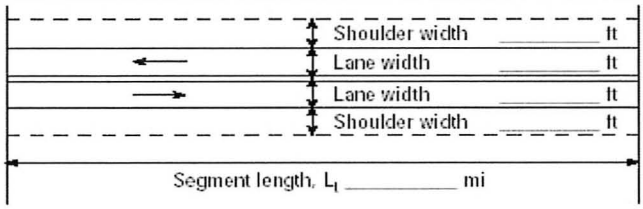
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (eastbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - 2016 without

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *605*veh/h

Opposing direction vol., V_o *400*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.6*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.962*	*0.945*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.98*	*0.92*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	*713*	*511*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.0 mi/h*
		Percent free flow speed, PFFS	*76.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.98*	*0.93*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*686*	*489*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*61.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*68.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.42*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1520*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1577*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*76.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*672.2*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.69*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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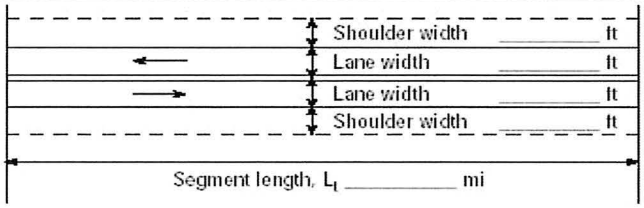
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (eastbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 without

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *329*veh/h

Opposing direction vol., V_o *413*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.940*	*0.945*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.88*	*0.93*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*442*	*522*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*34.1 mi/h*
		Percent free flow speed, PFFS	*80.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.965*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.94*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*430*	*500*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*52.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1536*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1594*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*365.6*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.38*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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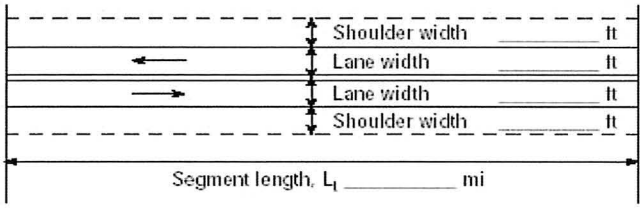
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (eastbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - 2016 with

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *623*veh/h

Opposing direction vol., V_o *406*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.6*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.962*	*0.945*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.98*	*0.93*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	*734*	*513*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*31.9 mi/h*
		Percent free flow speed, PFFS	*75.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.99*	*0.93*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*699*	*497*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*61.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*68.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.43*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1536*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1594*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*75.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*692.2*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.70*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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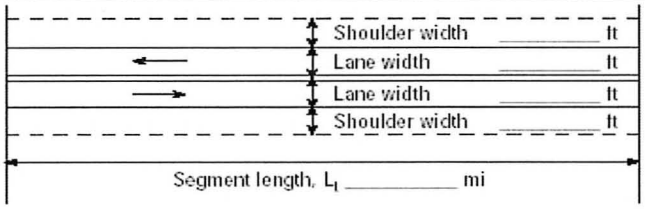
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	Lambert Lane (eastbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 with

Project Description: *Lambert Lane East of La Cholla*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *340*veh/h

Opposing direction vol., V_o *433*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	2.0	1.8
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.940	0.951
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.88	0.94
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	457	538

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	45.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.6 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	42.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	33.9 mi/h
		Percent free flow speed, PFFS	80.4 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.6	1.4
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.965	0.977
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.89	0.95
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	440	519
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	48.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	13.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	54.6	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.27

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1536*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1613*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*377.8*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.39*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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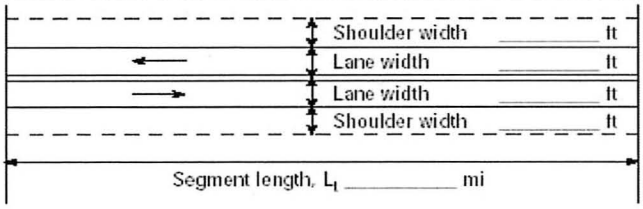
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (northbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - existing

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *392*veh/h

Opposing direction vol., V_o *489*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.951*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.92*	*0.96*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*501*	*595*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*33.2 mi/h*
		Percent free flow speed, PFFS	*78.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*0.988*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.92*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*485*	*573*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*57.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.29*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1560*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1629*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*78.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*435.6*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.47*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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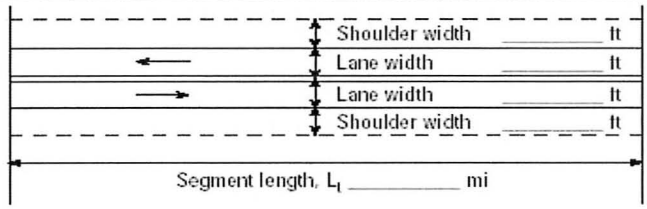
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (northbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - existing

Project Description: *La Cholla East of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *435*veh/h

Opposing direction vol., V_o *252*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.935*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.94*	*0.81*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*541*	*370*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*34.2 mi/h*
		Percent free flow speed, PFFS	*81.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.95*	*0.84*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*521*	*347*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*50.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*57.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1367*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1428*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.3*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.52*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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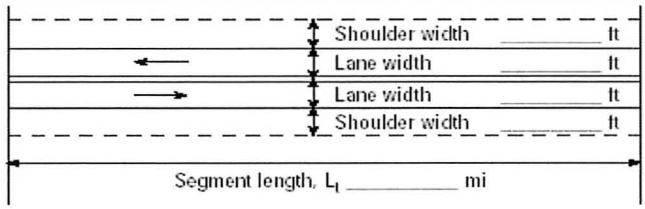
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (northbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - 2016 without

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d	*409*veh/h
Opposing direction vol., V_o	*510*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.956*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.93*	*0.96*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	*517*	*617*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*33.0 mi/h*
		Percent free flow speed, PFFS	*78.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*0.988*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.93*	*0.97*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^* f_{HV,PTSF}^* f_{g,PTSF})$	*500*	*591*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*52.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*58.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.30*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1576*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1629*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*78.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*454.4*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.49*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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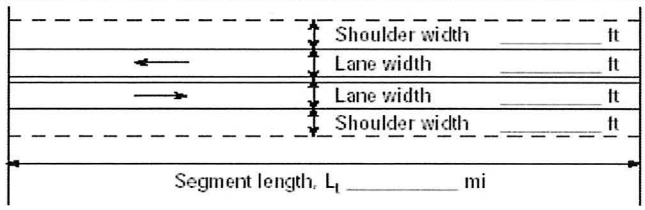
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (northbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 without

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.90

No-passing zone 0%

% Trucks and Buses , P_T 6 %

% Recreational vehicles, P_R 4%

Access points *mi* 1/mi

Analysis direction vol., V_d 453veh/h

Opposing direction vol., V_o 264veh/h

Shoulder width ft 2.0

Lane Width ft 12.0

Segment Length mi 0.5

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.8	2.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.951	0.935
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.95	0.82
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	557	383

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	45.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.9 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	42.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	34.0 mi/h
		Percent free flow speed, PFFS	80.6 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.2	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.988	0.960
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.96	0.85
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	531	360
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	50.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	12.3	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	57.5	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.33

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1390*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1444*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*503.3*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.54*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
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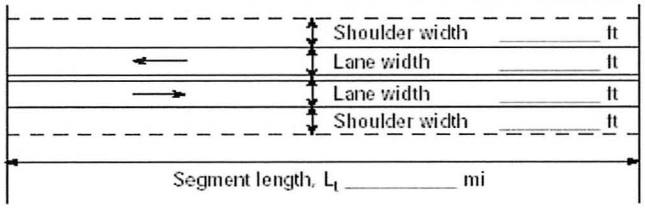
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (northbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - 2016 with

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *444*veh/h

Opposing direction vol., V_o *533*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.956*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.97*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*546*	*639*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.6 mi/h*
		Percent free flow speed, PFFS	*77.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.977*	*0.988*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.97*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*526*	*618*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*54.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*60.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1576*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1649*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*77.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*493.3*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.53*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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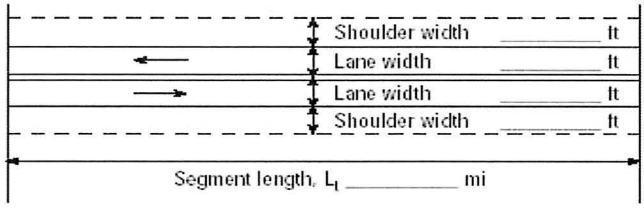
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (northbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 with

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *488*veh/h

Opposing direction vol., V_o *306*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.935*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.96*	*0.86*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	*594*	*423*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*33.4 mi/h*
		Percent free flow speed, PFFS	*79.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.988*	*0.965*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*572*	*405*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*61.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1438*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1494*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*542.2*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.58*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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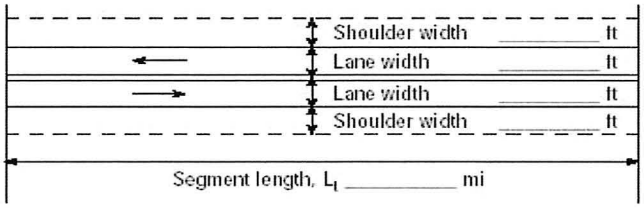
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (southbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - existing

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *489*veh/h

Opposing direction vol., V_o *392*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.945*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.96*	*0.92*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	*595*	*501*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*33.0 mi/h*
		Percent free flow speed, PFFS	*78.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.988*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.92*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*573*	*485*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*55.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*63.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1520*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1577*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*78.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*543.3*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.58*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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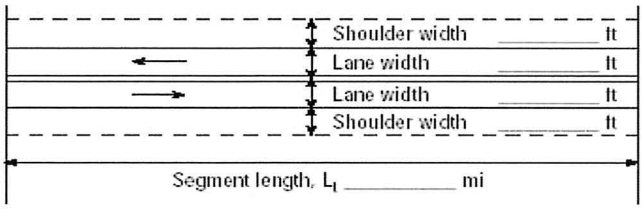
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (southbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - existing

Project Description: *La Cholla East of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *252*veh/h

Opposing direction vol., V_o *435*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.935*	*0.951*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.81*	*0.94*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*370*	*541*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.5 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*34.5 mi/h*
		Percent free flow speed, PFFS	*81.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.84*	*0.95*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*347*	*521*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*41.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*46.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.22*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1536*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1613*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*280.0*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.24*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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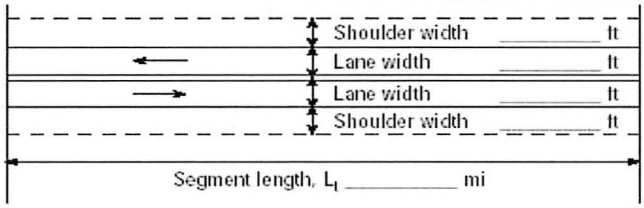
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Gutknecht*	Highway / Direction of Travel	*La Cholla (southbound)*
Agency or Company	*SWTE*	From/To	
Date Performed	*9/12/2014*	Jurisdiction	
Analysis Time Period		Analysis Year	*AM Peak Hour - 2016 without*

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *510*veh/h

Opposing direction vol., V_o *409*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.956*	*0.945*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.96*	*0.93*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*617*	*517*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.7 mi/h*
		Percent free flow speed, PFFS	*77.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.988*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.97*	*0.93*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*591*	*500*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*56.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*63.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1536*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1594*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*77.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*566.7*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.60*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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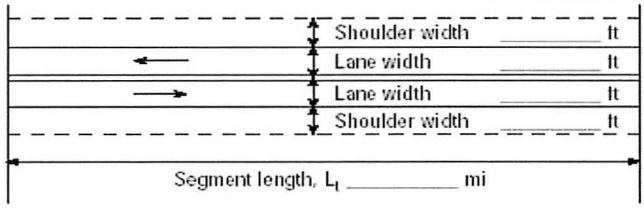
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Gutknecht*	Highway / Direction of Travel	*La Cholla (southbound)*
Agency or Company	*SWTE*	From/To	
Date Performed	*9/12/2014*	Jurisdiction	
Analysis Time Period		Analysis Year	*PM Peak Hour - 2016 without*

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d	*264*veh/h
Opposing direction vol., V_o	*453*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.935*	*0.951*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.82*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS}^* f_{HV,ATS})$	*383*	*557*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.5 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*34.3 mi/h*
		Percent free flow speed, PFFS	*81.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.988*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.85*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*360*	*531*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*41.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*12.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*46.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.23*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1552*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1613*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*293.3*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.26*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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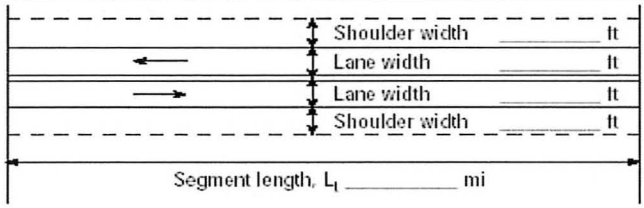
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (southbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	AM Peak Hour - 2016 with

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *533*veh/h

Opposing direction vol., V_o *444*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.956*	*0.951*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.97*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*639*	*546*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*45.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.5 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*42.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*32.4 mi/h*
		Percent free flow speed, PFFS	*76.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.988*	*0.977*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.97*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*618*	*526*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*58.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*65.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.38*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1552*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1613*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*76.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*592.2*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.62*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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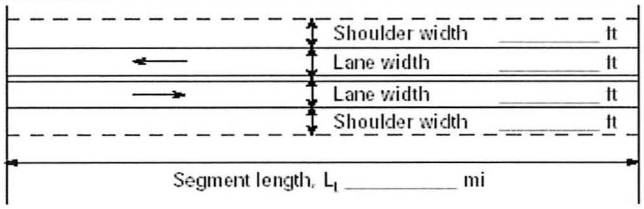
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	Gutknecht	Highway / Direction of Travel	La Cholla (southbound)
Agency or Company	SWTE	From/To	
Date Performed	9/12/2014	Jurisdiction	
Analysis Time Period		Analysis Year	PM Peak Hour - 2016 with

Project Description: *La Cholla south of Lambert*

Input Data



☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *0%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *1*/mi

Analysis direction vol., V_d *306*veh/h

Opposing direction vol., V_o *488*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	2.1	1.8
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.935	0.951
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.86	0.96
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	423	594

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	45.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	42.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	33.8 mi/h
		Percent free flow speed, PFFS	80.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.6	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.965	0.988
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.87	0.96
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	405	572
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	45.1	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	12.6	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	50.3	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.25

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1560*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1629*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*340.0*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.34*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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TRAFFIC IMPACT ANALYSIS
PROPOSED NEIGHBORHOOD
SOUTHEAST OF LA CHOLLA BOULEVARD/LAMBERT LANE

APPENDIX

Turn Lane Analysis

Signalized Intersection (Right Turn Storage)

Location: Lambert Lane/La Cholla Boulevard **2016 With Project**
Approach/Leg: Northbound

V = vehicles per hour Cycle Length = 90 sec

PM Peak Hour
V = 183 vph

Vehicles/cycle = 2 x (vehicles/hour)/cycles/hour
Storage length = vehicles/cycle x 25 feet

$$S\ (ft) = \frac{183\ vph*(2)*(25\ ft/veh)*(90sec/cycle)}{(3600sec/hr)} = 229\ feet$$

Minimum Recommended Storage: 250 feet

Signalized Intersection (Left Turn Storage)

Location: Lambert Lane/La Cholla Boulevard **2016 With Project**
Approach/Leg: Eastbound

V = vehicles per hour Cycle Length = 90 sec

PM Peak Hour
V = 136 vph

Vehicles/cycle = 2 x (vehicles/hour)/cycles/hour
Storage length = vehicles/cycle x 25 feet

$$S\ (ft) = \frac{136\ vph*(2)*(25\ ft/veh)*(90sec/cycle)}{(3600sec/hr)} = 170\ feet$$

Minimum Recommended Storage: 175 feet

Signalized Intersection (Left Turn Storage)

Location: Lambert Lane/La Cholla Boulevard **2016 With Project**
Approach/Leg: Westbound

V = vehicles per hour Cycle Length = 90 sec

PM Peak Hour
V = 62 vph

Vehicles/cycle = 2 x (vehicles/hour)/cycles/hour
Storage length = vehicles/cycle x 25 feet

S (ft) = 62 vph*(2)*(25 ft/veh)*(90sec/cycle) = / (3600sec/hr) = 78 feet

Minimum Recommended Storage: 100 feet

Signalized Intersection (Left Turn Storage)

Location: Lambert Lane/La Cholla Boulevard **2016 With Project**
Approach/Leg: Northbound

V = vehicles per hour Cycle Length = 90 sec

PM Peak Hour
V = 30 vph

Vehicles/cycle = 2 x (vehicles/hour)/cycles/hour
Storage length = vehicles/cycle x 25 feet

S (ft) = 30 vph*(2)*(25 ft/veh)*(90sec/cycle) = / (3600sec/hr) = 38 feet

Minimum Recommended Storage: 50 feet

Signalized Intersection (Left Turn Storage)

Location: Lambert Lane/La Cholla Boulevard **2016 With Project**
Approach/Leg: Southbound

V = vehicles per hour Cycle Length = 90 sec

PM Peak Hour

V = 97 vph

Vehicles/cycle = 2 x (vehicles/hour)/cycles/hour

Storage length = vehicles/cycle x 25 feet

$$S\ (ft) = \frac{97\ vph*(2)*(25\ ft/veh)*(90sec/cycle)}{(3600sec/hr)} = 121\ feet$$

Minimum Recommended Storage: 125 feet

Un-Signalized Intersection (Left Turn Lane)
Location: South Driveway/Owl Head Place **2016 With Project**
Approach/Leg: Southbound

V = vehicles per hour

AM Peak Half Hour
V = 34 vtph

S = Storage = (V *2 min* 25 ft/veh)/60min/hr

$$S\ (ft) = \frac{34\ vph*(2\ min)*(25\ ft/veh)}{(60\ min/halfhr)} = 28\ feet$$

Minimum Recommended Storage: 50 feet

Un-Signalized Intersection (Left Turn Lane)
Location: North Driveway/Lambert Lane **2016 With Project**
Approach/Leg: Westbound

V = vehicles per hour

AM Peak Half Hour
V = 20 vtph

S = Storage = (V *2 min* 25 ft/veh)/60min/hr

$$S\ (ft) = \frac{20\ vph*(2\ min)*(25\ ft/veh)}{(60\ min/halfhr)} = 17\ feet$$

Minimum Recommended Storage: 25 feet

CULTURAL RESOURCE REPORT

Tierra Right of Way™
A LAND SERVICES COMPANY

A Class III Cultural Resources Survey of 61 ha (143 Acres) near the Southeast Corner of La Cholla Boulevard and Lambert Lane, in the Town of Oro Valley, Pima County, Arizona

Prepared by:
Joseph Howell, M.A.

Tierra Archaeological Report No. 2015-012
March 12, 2015

A Class III Cultural Resources Survey of 61 ha (143 Acres) near the Southeast Corner of La Cholla Boulevard and Lambert Lane, in the Town of Oro Valley, Pima County, Arizona

Prepared by:
Joseph Howell, M.A.

Principal Investigator:
Barbara K. Montgomery, Ph.D.

Prepared for:
Peter Fasscas
Future Arizona, Inc.
1555 North Astor Street
Chicago, Illinois 60610

Submitted by:
Tierra Right of Way Services, Ltd.
1575 East River Road, Suite 201
Tucson, Arizona 85718

Tierra Archaeological Report No. 2015-012
March 12, 2015

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INTRODUCTION

At the request of Peter Fasseas of Future Arizona, Inc. (FAI), Tierra Right of Way Services, Ltd. (Tierra), performed a Class III cultural resources survey of approximately 61 ha (143 acres) for a proposed development in the Town of Oro Valley, Pima County, Arizona. The cultural resources survey is part of a rezoning application submitted by FAI to the Town of Oro Valley. To determine if any prehistoric or historic resources that might be adversely affected by the proposed project are present in the subject property, a cultural resources survey was required for the completion of the rezoning application. Barbara K. Montgomery, Ph.D., acted as Tierra's principal investigator and Tom Euler was the project manager. Fieldwork was conducted on March 6, 2015, by Tierra archaeologists Chance Copperstone, M.A. (field director), Joseph Howell, M.A. (field technician), and Tom Robinson (field technician). The Arizona State Historic Preservation Office (SHPO) Survey Report Summary Form is included in Appendix C.

THE PROJECT AREA

The project area is located in the Town of Oro Valley in Pima County, Arizona (Figures 1 and 2; Photo 1). It is located in the northwest quarter of Section 15, Township 12 South, Range 13 East, Gila and Salt River Baseline Meridian (G&SRB&M), on the Ruelas Canyon, Arizona (1992), U.S. Geological Survey 7.5-minute topographic quadrangle. The subject parcel consists of undeveloped private land southeast of the intersection of La Cholla Boulevard and Lambert Lane. The parcel consists of undulating land cut by three large, unnamed main ephemeral drainages that are tributaries of Cañada del Oro and numerous smaller gullies and rills. It is located on the M1 piedmont deposits, which are isolated from fluvial processes except for the deeply cut channels (McKittrick 1988:3).

The project area lies within the Arizona Upland Subdivision of the Sonoran Desertscrub biotic community (Turner and Brown 1994), at a mean elevation of 774 m (2,540 feet) above mean sea level (AMSL). Dominant plant species within this subdivision include triangle-leaf bursage *(Ambrosia deltoidea)*, creosotebush *(Larrea tridentata)*, mesquite (*Prosopis* spp.), catclaw acacia *(Acacia greggii)*, whitethorn acacia *(Acacia constricta)*, palo verde *(Parkinsonia microphylla)*, and various species of cacti, prickly pear (*Opuntia* spp.) and several types of cholla (*Cylindropuntia* spp.) being the most prevalent. Old, large saguaros *(Carnegiea gigantea)* are also prominent in the project area.

CULTURE HISTORY

Paleoindian and Early Archaic Periods (11,000–6000 B.C.)

The first known inhabitants of southern Arizona are referred to by archaeologists as Paleoindians. These groups were migratory peoples who entered North America during the Pleistocene epoch. Two classic characteristics of Paleoindian sites are the presence of fluted, lanceolate projectile points (i.e., Clovis points; see below) and the fossil remains of now-extinct species, particularly Pleistocene megafauna such as mammoth (*Mammuthus* spp.) and ancient bison *(Bison antiquus)* (Reid and Whittlesey 1997:30–37). The Paleoindians were originally conceptualized purely as big-game hunters, but it is now understood that these people actually exploited a spectrum of biological resources, a subsistence strategy not unlike those practiced by later Archaic period peoples (Mabry 1998:105–107).

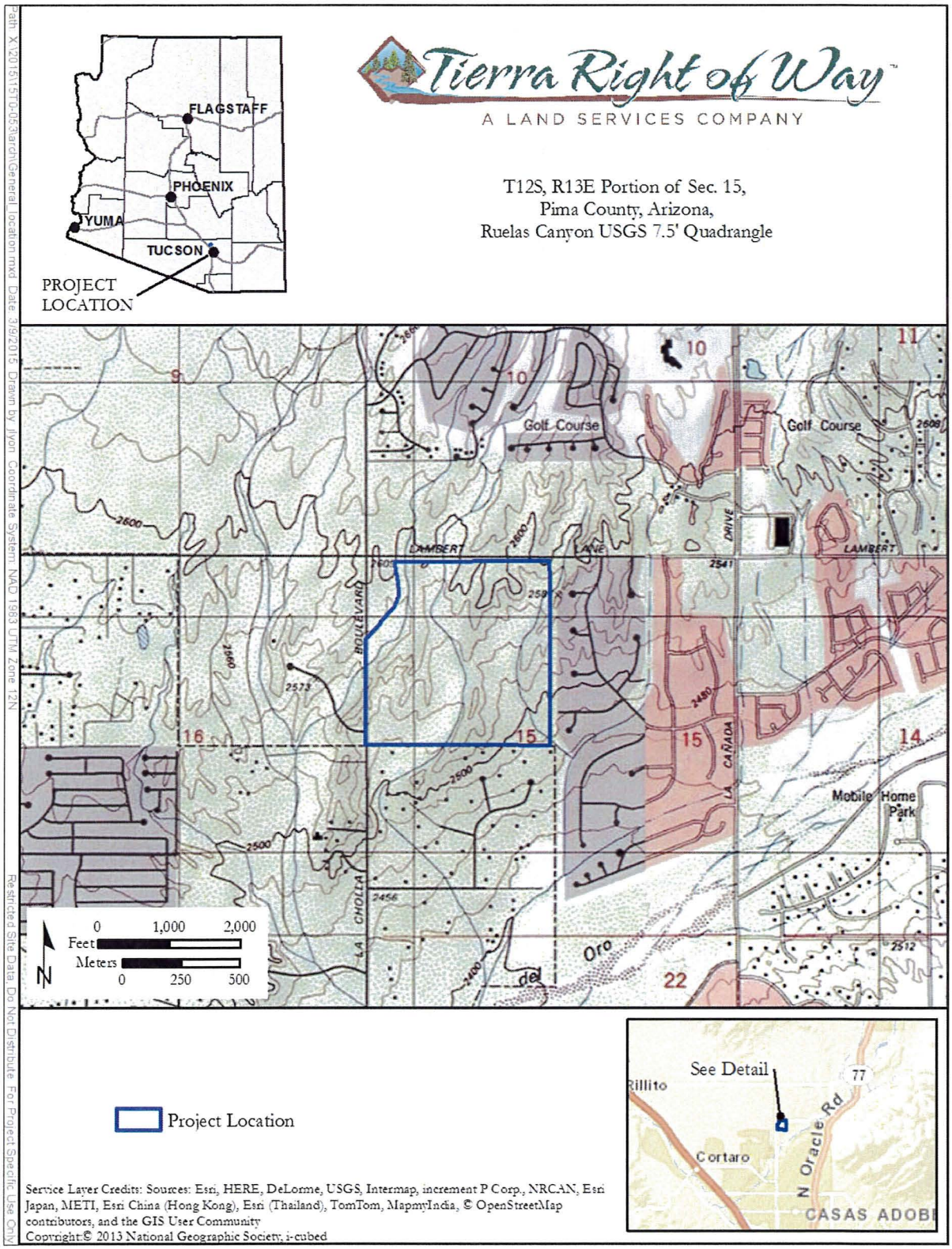

Figure 1. Project location.

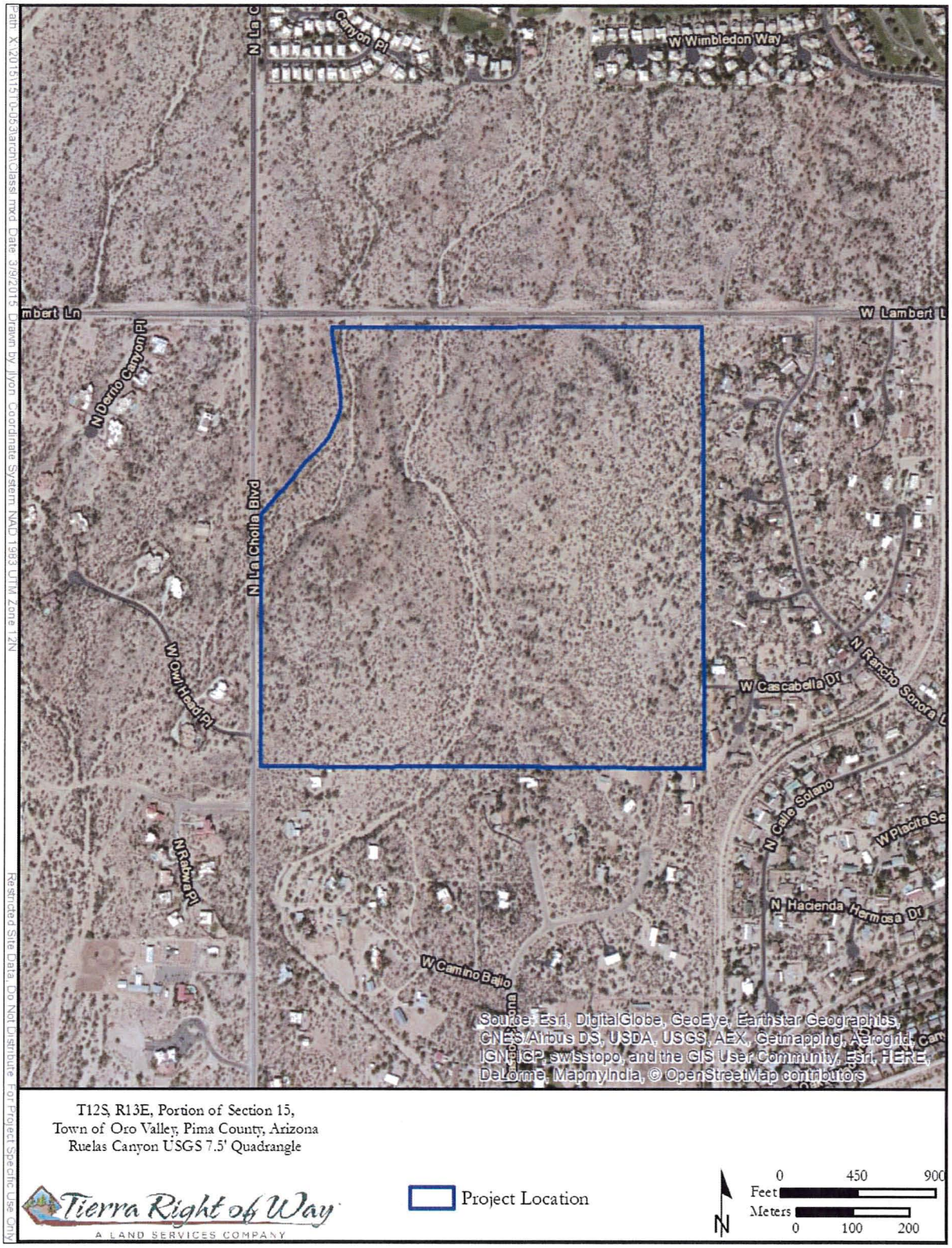

Figure 2. Detailed project location.

Photo 1. Overview of the project area. View is to the northwest.

The earliest definitively dated archaeological sites in the Southwest are Clovis occupations, typified by Clovis points. These points display concave bases, basal fluting, and lateral and marginal grinding (Slaughter 1992:72). Several important Clovis sites, including Naco, Lehner, Escapule, and Murray Springs, are located in the upper San Pedro valley of southeastern Arizona (Faught and Freeman 1998:41). At the Murray Springs site, two Clovis points were found in association with an unbutchered mammoth. Apart from these sites, much of the evidence for a Clovis presence in Arizona is reflected in isolated occurrences of Clovis points (either whole or fragments). Clovis points are known from the St. Johns and Winslow areas for example (Neily 1985:10) and from the San Pedro valley near Kartchner Caverns (Faught and Freeman 1998:44). In Tucson, a Clovis point was discovered in a disturbed context at the Valencia site (Doelle 1985:181). The Clovis complex was succeeded by the Folsom complex, which, like the Clovis, is typified by its distinctive projectile points. Folsom points, unlike Clovis points, have flutes that extend all the way from their proximal to distal ends and have pressure-flaked marginal edges. In Arizona, the only known Folsom points have been found in surface contexts on the Colorado Plateau and the mountain transition zone to the south of the Mogollon Rim (Faught and Freeman 1998:45).

The Early Archaic period (ca. 8500–6000 B.C.) is known in southern Arizona as the Sulphur Spring phase. This phase was originally defined by Sayles and Antevs in 1941 in the Sulphur Springs Valley in southeastern Arizona (Sayles and Antevs 1941). Problems with dating (a result of the work having taken place prior to the development of carbon-dating techniques) originally led Sayles to conclude that a Paleoindian tradition typified by the exploitation of megafauna coexisted here with a hunting-and-gathering tradition that exploited smaller game and various plant resources, as reflected in an artifact assemblage composed of flat milling stones, unifacial scrapers, and other lithic implements. This assessment turned out to be incorrect; however, a reexamination of the material from the

Sulphur Springs Valley did establish a reliable beginning date for the Sulphur Spring phase. Even though they have now been dated with certainty, the sites investigated by Sayles did not include any artifacts that were stylistically distinctive (e.g., projectile points) and therefore temporally diagnostic. In southern Arizona, there has been an overall lack of diagnostic projectile points recovered from Early Archaic sites that can be directly correlated in time with the Sulphur Spring phase. It is therefore difficult to date sites to this phase when other, more-direct methods of dating, such as radiocarbon dating, cannot be used (Huckell 1996:329). One exception to this lack of diagnostic artifacts at Sulphur Spring phase sites is Ventana Cave, where 17 stemmed Ventana-Amargosa points were recovered by Haury (1950) under the Red Sand deposit. The stratigraphic location of these points suggested they were manufactured and deposited sometime after 6700 B.C. Similar points have been reported from Archaic contexts in the northern Santa Rita Mountains, but, again, no associated datable material was found in the same context as the points (Huckell 1996:330–331).

Middle Archaic Period (6000–2100 B.C.)

The Middle Archaic period, also known as the Chiricahua phase of the Cochise culture in the tripartite stage designation schema of Sayles and Antevs (1941) and Sayles (1945), is part of the broader cultural entity that archaeologists have conceptualized as the Archaic period. In terms of material culture, the Middle Archaic period is typified by the addition of shallow basin metates, mortars and pestles, various bifacial tools, and distinctive side-notched projectile points to the overall tool assemblage of the preceding Early Archaic period. Generally, the Middle Archaic period is viewed as a time when regional variations in this material culture across the Southwest became less pronounced. In particular, notched projectile points take on a general similarity of design over large geographic regions. Chiricahua points, for example, are similar in style and manufacturing technique to Pinto and San Jose points, which are found in other areas of Arizona (Slaughter 1992:70). It is thought that this uniformity of technology is related to the high degree of mobility that was presumably characteristic of populations living during this period. Similarly, concave-base Cortaro points, often associated with the succeeding Late Archaic–Early Agricultural period but also present in Middle Archaic contexts, are widely distributed across southern Arizona and have possible equivalents in southern New Mexico and California (Justice 2002:181–182).

In the Tucson Basin, surface Middle Archaic period sites are known from montane and bajada contexts, with the typical artifacts mentioned above in addition to fire-cracked rock and occasional rock cairn burials (Huckell 1995:3). Subsurface Middle Archaic remains are known from two sites in the Santa Cruz River valley—the Los Pozos (Gregory 1999) and Rillito Fan sites (Wallace 1996).

Late Archaic–Early Agricultural Period (2100 B.C.–A.D. 150)

As the name implies, the Late Archaic–Early Agricultural period in the Southwest is marked by the widespread adaptation of cultivated food resources. In this region, this period is also marked by the appearance of permanent or semipermanent domestic architecture, canal irrigation, and the first Mesoamerican cultivars, which arrived as early as the beginning of the second millennium B.C. (Huckell 1996:343)—though maize may have arrived somewhat earlier. At the same time, the period is generally thought to be a time during which people continued a lifeway that remained relatively mobile with the objective of exploiting wild food resources; sites that reflect these activities continue to be categorized under the designation of Late Archaic (Huckell 1995). This period is thought to be one in which groups of people practicing a relatively mobile lifeway began to incorporate, over a long span of time, agricultural products as significant elements of their subsistence.

Work in the Southwest during the past two decades, particularly in the Santa Cruz River valley, has resulted in the discovery of numerous Late Archaic–Early Agricultural period sites and the establishment of a phase sequence for the period. The earliest phase (dated 2100–1500 B.C.) is presently unnamed and is defined by the first appearance of maize *(Zea mays)*, pepo squash *(Cucurbita pepo)*, storage pits, and large, circular pit structures. Fired sherds, perhaps from incipient vessels, and figurine fragments that date to about 2100 B.C. have been recovered in the Tucson Basin (Mabry 2007:7).

The San Pedro phase (1500–800 B.C.) continued to include these attributes, with the addition of corner-notched San Pedro dart points—a hallmark of the phase—and, in the San Pedro core area, Empire points (Mabry 2007:Figure 1.3). Cultivars added to the crop complex included cotton (*Gossypium* sp.) and possibly the common bean *(Phaseolus vulgaris)*. Also appearing during the San Pedro phase were specialized storage structures with large, interior bell-shaped pits; oval and round house-in-pit type structures; a wider variety of functional extramural pits; flexed inhumations, often in cemeteries; stone and bone pipes; distinctive ceramic figurines; canid burials; refinements in ground stone technology; and, in the Santa Cruz River valley, canal-irrigated farming (Mabry 2007:7–9,15–18). Large communal ritual pit structures, perhaps descendents of even larger pre–San Pedro types), were present during the San Pedro phase. The bow and arrow may also have appeared in the Southwest during this time.

The Cienega phase completes the Late Archaic–Early Agricultural period phase sequence. The Cienega phase was initially proposed by Huckell (1995) and is marked by the appearance of Cienega points, which are distinguished morphologically by deep, oblique corner notching and flaring stems and were used as dart and possibly arrow points (Lorentzen 1998:150). The Cienega phase was also characterized by an emphasis on large, circular pit structures that often had cylindrical and, less frequently, bell-shaped subfloor pits (Huckell 1995); a more diverse ground stone artifact assemblage that included stone disks and well-made stone trays; and large, communal houses that may have developed from San Pedro phase predecessors.

Early Ceramic Period (A.D. 150–650)

In both the Tucson and Phoenix Basins, the Early Ceramic period appears to have developed out of the cultural matrix of the Late Archaic–Early Agricultural period; work in the Tucson area in particular has, over the past several years, yielded a large amount of data supporting this idea. Sites in the Tucson region where the Early Ceramic period has been studied extensively include the Houghton Road site (Ciolek-Torrello 1998) and several sites along the Santa Cruz River.

Two Early Ceramic phases have been proposed for the Tucson Basin: the Agua Caliente phase and the Tortolita phase. The Agua Caliente phase (A.D. 150–450) is marked by the appearance of plain, smudged, and incipient red ware vessels produced by hand-molding, scraping and paddling; it represents the ceramic Plain Ware horizon in the Tucson Basin (Ciolek-Torrello 1998:261). Vessel forms across the Southwest at this time consisted predominately of neckless seed jars, which were well-suited for storage purposes, and small hemispherical bowls. This phase was also characterized by an assemblage of milling stones, an expedient flaked stone industry accompanied by a remnant Archaic period bifacial tool technology, and domestic and communal pit houses (Whittlesey and Heckman 2000a:6). Flexed inhumations and small grinding equipment typical of the Late Archaic–Early Agricultural period continued into this phase (Ciolek-Torrello 1995:542). Architecture became more formal in design, with houses incorporating formal plastered hearths and clearly defined entryways.

House shapes are generally rectangular, or in some cases kidney-bean shaped, with plastered pillars or post supports on either side of the house entryways. The communal structures are larger but share morphological attributes of the smaller houses and are strikingly similar to Mogollon communal structures, which eventually evolved into Great Kivas (Reid and Whittlesey 1997:143).

The Tortolita phase (A.D. 450–650) represents the Red Ware horizon in the Tucson Basin and corresponds approximately with the beginning of the Vahki phase (characterized by Vahki Red Ware) in the Phoenix Basin. Tortolita Red is hard-slipped, usually (but not always) on both vessel surfaces, and is typically sand-tempered (Bernard-Shaw 1990; Heidke 2003:148). An additional important change in ceramic manufacture during the Tortolita phase is the expansion of vessel forms from the Agua Caliente–type seed jar to a variety of vessel forms, including flared-rim forms, intended for cooking and serving (Heidke 2003:148). Tortolita phase settlements are larger with more formal patterning than previous Agua Caliente phase settlements, were increasingly dependent on maize, and placed greater emphasis on sedentism. In the Santa Cruz River valley, Tortolita phase sites or sites with a Tortolita component have become relatively well-documented and are currently better known than Agua Caliente sites.

The Hohokam (A.D. 650–1450)

Pioneer Period (A.D. 650–750)

The Pioneer period in the Tucson Basin is not currently well-understood. As mentioned earlier, the first phase of the Pioneer period—the Vahki phase of the Salt-Gila Basin—is equivalent to the Tortolita phase Red Ware horizon in the Tucson Basin. The remaining phases of the Salt-Gila sequence—Estrella, Sweetwater, and Snaketown—are marked by the appearance of decorated pottery. The Estrella phase pottery (Estrella Red-on-gray) is distinguished by painted broadline designs in quartered layouts, typically on bowl interiors. It has been suggested that the appearance of this pottery tradition marks a broadline ceramic horizon, similar to the earlier Plain and Red Ware horizons (Whittlesey and Heckman 2000a:8). Incised pottery also appeared during the Estrella phase (Whittlesey and Heckman 2000b:98).

In the Tucson Basin, red ware ceramics continued to be produced into the Cañada del Oro phase (Wallace et al. 1995:596), and the beginning of the Broadline horizon appears to be more reflective of the addition of broadline decorated pottery to the existing plain and red ware ceramic complex. Broadline ceramics are not common in the Tucson Basin, and they appear to have been restricted to a relatively short span of time. Similar remarks apply to Sweetwater Red-on-gray and Snaketown Red-on-buff ceramics, which display fine-lined and increasingly elaborate designs.

It is during the Snaketown phase, the final phase of the Pioneer period, that distinctly Hohokam traits in material culture become evident in the Tucson Basin, in ceramic design and other technologies. The Snaketown phase, when true red-on-buff ceramics began to be produced, has been viewed by some archaeologists as being the actual beginning of what can be reliably defined as Hohokam, although others believe that Hohokam culture cannot be defined until the Colonial period, when hallmark traits such as ballcourts and a distinctive mortuary complex appeared (Wallace et al. 1995:576, 606).

The Pioneer period in the Tucson Basin, if accepted as being truly present at all, lasted approximately a century. It was characterized by the temporally limited appearance of the Broadline

horizon in the form of Estrella and Sweetwater Red-on-gray ceramics, with the similarly brief appearance of the Snaketown phase (at least in terms of ceramic tradition) as a precursor to the Cañada del Oro phase.

Colonial Period (A.D. 750–950)

The Tucson Basin Colonial period comprises two phases: the Cañada del Oro phase (A.D. 750–850) and the Rillito phase (A.D. 850–950). Several distinguishing cultural traits mark the advent of the Colonial period.

Canal irrigation had been widespread in the Salt-Gila Basin during the Snaketown phase and continued to expand there during the Colonial period. Ballcourts were spaced at an average of 5.5 km (3.4 miles) along the Phoenix canals, suggesting that ballcourts served to identify their villages as the centers of "irrigation communities" (Wilcox and Sternberg 1983). During the Colonial period, the Santa Cruz River was recovering from a period of entrenchment that had begun in about 50 B.C. This resulted in an environment that was increasingly conducive to floodwater farming (Waters 1992:175). Settlement expanded in the Tucson Basin, with ballcourt villages being constructed in the Santa Cruz River valley at several sites. Ballcourts, primary indicators of Mesoamerican influence in the Southwest at this time (Wilcox and Sternberg 1983), likely served as focal points for regional socioeconomic interaction. The large communal houses that had been constructed at many sites from the Late Archaic–Early Agricultural period onward disappeared during the Colonial period. Village settlement was patterned on individual houses organized into house clusters (also termed courtyard groups) that were oriented around a central plaza, a pattern that was already evident during the Pioneer period. Ceramic design began incorporating zoomorphic and anthropomorphic imagery and micaceous temper, which has been interpreted as a result of cultural influence originating in the Salt-Gila Basin (Wallace et al. 1995:601, 605–607).

Cremation burial had virtually replaced inhumation burial by the middle of the Colonial period (Wilcox 1991:270). Even though this trait is a defining characteristic of the Colonial period, it had precedents in the Pioneer period (Crown 1991:145–146). Hohokam cremation burials typically included palettes, worked shell, and stone censors as mortuary offerings. The cremations were placed in discrete cemeteries that became components of the typical Hohokam village and are frequently associated with plazas and house groups and their accompanying trash mounds. Such cemeteries were apparently associated with the suprahouseholds represented by the house cluster/plaza/trash mound complexes (Wilcox 1991:256).

Sedentary Period (A.D. 950–1150)

The Sedentary period in the Tucson Basin is divided into three subphases: the Early, Middle, and Late Rincon. In the Salt-Gila Basin, it is composed of a single phase, the Sacaton. During the Early Rincon subphase (A.D. 950–1000), the settlements that had been established along major drainages during the Colonial period increased in size, and new settlements expanded along secondary drainages and into bajada environments, allowing for a diversification of agricultural strategies (Crown 1991:149; Wellman and Lascaux 1999:24). Major habitation sites were established at regular intervals along waterways. Villages continued to resemble their Colonial predecessors with their ballcourts and plaza-oriented clusters of dwellings, but smaller settlement types, such as farmsteads, started to appear around the peripheries of larger villages. The construction of ballcourts and the intricate trade network associated with them reached its maximum extent during the Sedentary period (Doyel 1991b:247), although their construction decreased in the Tucson Basin.

Ceramic design motifs took on increasingly geometric forms during this period. Sedentary motifs were less carefully executed than the fine-line work of Colonial period ceramics. The distinctive Gila shoulder, which was formed by the sides of a vessel sloping downward sharply from the neck to create a low shoulder near the base, became a diagnostic marker of the Sedentary period. The production of red ware, which had ceased around the end of the Cañada del Oro phase in Tucson, also began again. Cremation continued as the most common form of burial, but inhumations became more frequent after having been very uncommon or nonexistent during the Colonial period (Crown 1991:149–150). Copper bells, imported from western Mexico, first appeared during the Sedentary period, and shell etching was another innovation in material culture (Haury 1976:319).

Around A.D. 1000, at the beginning of the Middle Rincon subphase (A.D. 1000–1100), the Santa Cruz River again became entrenched. One result of this was a shift in settlement to the north and to the eastern region of the valley (Waters 1992:175–177). This in turn resulted in increasingly scattered settlements as villages became less riverine-oriented, at least in this area of the Tucson Basin. In the eastern Tucson region, established villages continued to expand. By the Late Rincon subphase, the continued adaptation of farming strategies such as ak-chin farming and runoff diversion to secondary drainages and bajadas had become widespread, with some of these niches being farmed for the first time. Environmental uncertainty may have served as the stimulus for non-floodwater farming. For example, there was an increased emphasis on the cultivation of agave on bajadas (Doyel 1991b:246; Whittlesey 2004:26–27).

During the final years of the Rincon phase, the ballcourt system began to decline, although ballcourts continued to be constructed into the Soho phase in the Phoenix region (Crown 1991: 151–152). Formally constructed platform mounds—in contrast to caliche-capped trash mounds, which are known from the Snaketown phase—began to be constructed and eventually eclipsed ballcourts as the primary form of public architecture by about A.D. 1200 (Doyel 2000:308). This has been interpreted as a change in overall polity as the Hohokam regional system and its accompanying trade relationships collapsed or were at least reorganized (Crown and Judge 1991:297). This change may likewise be reflected in the construction of single-room structures (possibly associated with rituals) on the mound summits and the incorporation of surrounding palisades and, later, adobe-walled compounds (Doyel 2000:305–307).

Classic Period (A.D. 1150–1450)

Southern Arizona societies experienced drastic changes during the Classic period—settlement patterns shifted, and public and domestic architecture changed. In the Tucson Basin, these changes occurred in two broad phases, the Tanque Verde phase (A.D. 1150–1300) and the Tucson phase (A.D. 1300–1450). During the Tanque Verde phase, Tanque Verde Red-on-brown became common across southern Arizona, while in Phoenix the production of red-on-buff ceramics declined (Reid and Whittlesey 1997). Some researchers have suggested that the widespread appearance of Tanque Verde Red-on-brown reflects an increasing complexity in the configuration of Hohokam economic and social relationships (Slaughter and Roberts 1996:14). Although pit house architecture continued, aboveground adobe and stone masonry structures, which were constructed within surrounding compound walls, became common. These structures were frequently freestanding, unlike multi-room pueblos commonly constructed elsewhere in the Southwest (Rice 2003:10).

In the Phoenix Basin, the platform mounds that appeared during the Soho phase were generally constructed at sites with extant ballcourts and were spaced along canals at 5.0 km (3.1 miles). The

location of the mounds in relation to the canal system could suggest that the mounds marked the centers of irrigation communities during this period, much like the ballcourts did in the Colonial period (Crown 1991). In the Tucson Basin, ballcourt construction had ceased by the Classic period, but the Marana community flourished (Fish et al. 1992). The Marana community extended across the northern circumference of the Tucson Basin and consisted of numerous types of sites centered around a platform mound—the Marana Mound site—that had replaced the regional ballcourts as the focal point of social integration. The community also had extensive agricultural fields that were irrigated by both dry-farming techniques and canals. Agave was the principal crop grown in these fields, presumably expanding from agave cultivation within the bajada environments that began during the Rincon phase (Fish et al. 1992:21–24). Agave is more resistant to drought than many of the other Hohokam cultivars, which would have made it a reliable food source during the drier climatic conditions that prevailed during the early Classic period (Masse 1991).

A serious drought, sometimes called the Great Drought, occurred between A.D. 1276 and 1299 (Reid and Whittlesey 1999:17). The Great Drought had the effect of forcing people who lived in regions north of the Mogollon Rim to travel southward across and off the Colorado Plateau in search of food sources; local agriculture had failed and could not support the population base. This resulted in an intercultural exchange between several groups, including the Mogollon, Hohokam, Salado, and Paquimé. Some Anasazi migrants from the Kayenta region arrived in southeastern Arizona as well, as reflected at Reeve Ruin in the San Pedro River valley (Whittlesey and Heckman 2000a:14).

During the Tucson phase, the cultural interaction that resulted from the drought became the impetus for further widespread social changes. Following the abandonment of many of the Tanque Verde phase sites, settlements aggregated into fewer, but larger, sites. This has been interpreted as a defensive tactic in the face of an increasing threat of warfare (Doelle and Wallace 1991:331). Freestanding adobe structures declined, and contiguous (sometimes multistoried) room blocks and stronger, more substantial walls became common (Doyel 1991a:253). Great houses, notably at Casa Grande and Pueblo Grande, appear at this time. The great houses at both sites were constructed on platform mounds. Village settlements frequently consisted of multiple compounds, occasionally concentrically arranged around a central compound mound (such as at Casa Grande and Los Muertos), similar to the older village plan of house clusters arranged around a central plaza, such as at Snaketown (Doyel 1991a:254–256).

After the beginning of the Tucson phase, evidence for the Salado culture appears in southeastern Arizona in the form of Roosevelt Red Ware ceramics, and it has been thought that the Salado superseded the Hohokam in the lower San Pedro River valley (in the region north of Benson) at about this time (Phillips et al. 1993). The culture known by archaeologists as "Salado" was initially formulated in the 1920s to describe and explain sites in the Tonto Basin and the upper Salt River that had a strong resemblance to Mogollon sites but also possessed Hohokam traits, such as platform mounds—although these sites, perhaps significantly, did not have ballcourts. Initially, it was thought that the Salado were pueblo-dwelling people migrating from the north and expanding into the Tonto Basin whose lifeways were imposed upon or adopted by the Hohokam people already living there (Reid and Whittlesey 1997:238–239). Archaeologists Florence Hawley and Harold Gladwin hypothesized that this migration originated from two areas: the upper Gila River region and, later, the Little Colorado River area. Finally, Emil Haury presented a somewhat modified version of the migration model, concluding that the Salado peoples did not "invade" the Hohokam so much as coexist in the same geographical region. Eventually, the migration hypothesis fell into disfavor, and by the 1980s, most Southwestern archaeologists had come to believe that the Salado

had developed "in place" from extant Hohokam populations, the result of increased "social complexity" rather than an influx of new people. Recent speculation that the presence of the Salado resulted from the intense demographic movements during the Classic period has led to a reconsideration of the migration model (Elson et al. 2000:175).

Protohistoric Period (A.D. 1450–1540)

The Protohistoric period—the era between the end of the Classic period and the arrival of the Spanish missionaries—is an obscure period in the prehistory of the Southwest. Comparatively little archaeological evidence belonging to this period has come to light, and much must be inferred from the accounts recorded by Spanish explorers of the state of the Southwest toward the end of the Protohistoric period.

One fundamental question pertains to this era: Who were the Piman-speaking peoples, such as the Sobaipuri of the San Pedro Valley, encountered by the Spanish in southern Arizona? There are two potential answers to this question. One is that the Piman-speaking people living in southern Arizona were simply direct descendants of the Hohokam populations who had faced the social and economic changes that marked the end of the Classic period. The other is that, after the decline of the Hohokam and Salado cultures, the Pimans moved into the area as a new cultural entity, although oral tradition suggests that they may have integrated with people who were already present (Teague 1993:444).

The possibility that Piman speakers were direct descendants of the Hohokam is suggested by the descriptive accounts of the Spanish as they moved northwest from central Mexico into what is now Sonora and Arizona. They found that the majority of people across this region practiced agriculture as a subsistence base. This subsistence strategy differed from those of the people in the surrounding regions of California and the Great Basin and the Athabaskan speakers in the northeast, where hunting and foraging prevailed. Second, little or no political unity was noted by the Spanish beyond the level of individual and autonomous *rancherías*—a system of organization unlike that encountered by the Spanish in Aztec-dominated central Mexico. Finally, trade across the region, although sporadic and not regularized, was widespread and generally did not involve food and tools, but emphasized luxury and ceremonial items instead (Spicer 1962:8–15). All of these traits might be expected to have been present at the time of European contact. Agriculture and trade had long been the norm, and the *rancherías* were perhaps the result of the social reorganization that occurred at the end of the Classic period.

In contrast, Teague (1993) suggests that both linguistics and Piman oral traditions support the idea that the Piman speakers the Spanish encountered had migrated into the region from elsewhere. Linguistically, there is continuity between west-central Mexico and southern Arizona that likely existed prehistorically and was paralleled by some aspects of material culture, notably ballcourts (Kelley 1991). This continuity exists among people speaking variants of the Tepiman language group. The languages spoken by some of the people in Sonora and southern Arizona belong to the Piman people, who were one of the members of the Tepiman group.

The oral traditions of the Piman people in southern Arizona are consistent with both the archaeological record and the linguistic model described above. These traditions focus on the conflict between Elder Brother, or I'itoi, the cultural hero of the Tohono O'odham (and who is known as Siuuhu among the Akimel O'odham) and the (Hohokam) Sivanyi or Siwani. In one

version of the story, Siwani is a personal name (Saxton and Saxton 1973:147–168), but the word Sivanyi also refers to a Hohokam priesthood and may be related linguistically to Shiwanni, the Zuni directional rain priesthoods (Teague 1993:439). The traditions state that warfare erupted between Siwani (or the Sivanyi) and I'itoi and his followers, whom (depending on the account) he gathered together from among the O'odham people of northern Sonora or who emerged from beneath the earth at a point south of Baboquivari. There are rather detailed accounts of the progression of the war against the Sivanyi and the eventual victory of I'itoi's warriors. Following the conflict and the disposal of the Sivanyi priesthood, the warriors dispersed. Some returned south to the Lower Piman homeland, and some went north to the pueblos, but some remained in the Gila Valley and intermarried into the local (Hohokam) population, eventually becoming the Pimas Gileños (Teague 1993:444). From the foregoing, it appears plausible that these traditions telling of a rebellion against a priestly hegemony at the end of the Classic period echo events that also are reflected in the archaeological record.

The Spanish, therefore, likely entered a world that had undergone traumatic social and environmental changes just before their arrival. It was also during this time (around A.D. 1600) that groups of Athabaskan-speaking people (Apaches) began to migrate to the area from the north and east.

Historic Period (A.D. 1540–1950)

Spanish exploration of the Southwest began as early as 1539 with the preliminary scouting expedition of Fray Marcos de Niza, who had been sent to the region by Mexican viceroy Antonio de Mendoza in response to the accounts of Alvar Núñez Cabeza de Vaca and an African named Esteban—the first person of Old World descent known to have passed through southeastern Arizona—who had wandered to Sonora after being shipwrecked in the Gulf of Mexico in 1528. Esteban was sent back out in 1539 as a guide on an expedition traveling from Sonora to the Pueblo country of northern New Mexico. When other members of his party fell ill, Esteban is believed to have traveled alone across the eastern edge of present-day Arizona to Zuni, where he was killed (Weber 1992). The nominal leader of the expedition, Fray Marcos de Níza, may or may not have eventually followed along. After de Niza's return, Viceroy Mendoza proposed a larger follow-up expedition and selected Vásquez de Coronado as its leader. Coronado's party departed in 1540 in search of the fabled Seven Cities of Cibola. The route of the expedition probably took Coronado through what is now eastern Arizona, although at one time it was speculated that one stop on the journey, Chichilticale or Red House, was in fact the Hohokam adobe house at Casa Grande (Wilson 1999:25–26).

Jesuit missionary Padre Eusebio Kino arrived in Sonora in 1681. After a poorly documented visit to the Casa Grande area in 1694, Kino made a second *entrada* into the area in 1697 (Wilson 1999:24). Setting out from the Nuestra Señora de Dolores mission, Kino traveled north along the San Pedro River and then followed the Gila River to the west, arriving again at Casa Grande on November 18. He was accompanied, in addition to some 20 soldiers and native guides, by Captain Juan Mateo Manje. Manje, unlike Kino, kept well-written journals of his travels. The chronicle of this expedition makes note of small groups of people living along the San Pedro who were identified as the Sobaipuri (Doelle and Wallace 1990). By 1700, Kino and his fellow Jesuits had established a chain of missions extending from present-day Sonora northward into what is now Arizona.

Owing to the efforts of Padre Kino, the missionizing of the people of the Pimería Alta continued into the early eighteenth century. However, after Kino's death in 1711, the mission system in Sonora began to deteriorate, partly as a result of neglect while Spain was distracted by the War of Spanish Succession (Walker and Bufkin 1979:14). After the Pima revolted in 1751, the presidio at Tubac was established. It was later relocated to Tucson near the end of 1775. The presidio was intended not only to provide stability for the Pima mission system but also to stem incursions by the Apache. The Apache had been raiding Piman settlements since shortly prior to the time of Kino's initial contact (Spicer 1962:234), and the escalation of raiding over time resulted in increasing resettlement of the Piman-speaking populace into defensible locations.

From the late 1780s, the implementation of a policy of "carrot-and-stick" diplomacy, by which Apaches and other nomadic tribes were supplied with gifts of food and other items in exchange for halting their raids on settlements, allowed for an expansion of ranching and stock raising all along Mexico's northern frontier. This time of relative peace ended with the independence of Mexico from Spain in 1821. With Spanish support no longer available, the Mexican government dropped their policy of purchasing a state of relative peace with stipends; raiding resumed, and ranching once again ceased to be viable (Morrisey 1950:151).

In the period between Mexico's independence and 1846 (the year the Mexican-American War began), Euroamericans first began to establish a substantial presence in the middle Gila River region. During the war, the "Army of the West," under the command of Colonel Stephen Watts Kearny, was assembled for the conquest of the Southwest, or more precisely, California (Sheridan 1995:50–51). The expedition, led by Kearny and guided by Kit Carson, passed along the Gila River and made the first accurate cartographic record of the region, which would later establish the route for Americans crossing Arizona on their way to California during the Gold Rush of 1849.

The Treaty of Guadalupe-Hidalgo, signed in 1848 following the conclusion of the Mexican-American War, ceded the portion of what is now Arizona lying north of the Gila River to the United States. The entire region stretching from the western border of Texas to the California coast became the Territory of New Mexico in 1850 and continued as such until 1863, when the Territory of Arizona was created by President Lincoln.

In 1854, the Gadsden Purchase expanded the New Mexico Territory from the Gila River south to the present-day Mexican border (Walker and Bufkin 1979:22). The Territory of Arizona was split off from the Territory of New Mexico in 1863. The first railroad, the Southern Pacific, reached Arizona from the west in 1877, but it did not reach Tucson until 1880 (Myrick 1975). Conflict between the Apache and the Euroamerican settlers continued until 1886, when Geronimo surrendered and a cessation of hostilities was negotiated (Collins et al. 1993:32). With the end of open hostilities, settlers resumed their migration to the area with the aid of the railroad. Mining and cattle ranching, which had already become fairly well-established in Arizona prior to the Civil War, became the Territory's main industries.

Arizona attained Statehood in 1912. From the end of the Civil War, ranching, homesteading, and increased urban development brought by the railroads had proliferated in the West, including in Arizona. Mining also played a vital role in Arizona's economy. In the 1930s, the Great Depression limited economic growth, and the mining industry was particularly affected. However, recovery from the Great Depression was extremely rapid in the Tucson Basin, as evidenced by a large population

increase. Ranching, mining, and farming continued to account for a large portion of the economic activity of the Tucson area even into comparatively recent times.

PREVIOUS RESEARCH

Prior to fieldwork, a Class I records check was performed using the AZSITE online database, which contains records pertaining to all surveys and sites registered with the Arizona State Museum (ASM). The Class I search found that 33 surveys had been conducted within a 1.6-km (1.0-mile) buffer zone surrounding the project area prior to the current project (Table 1; see Appendix A, Figure A.1); 4 previously recorded sites are also located within the buffer zone (Table 2; see Figure A.1). The project area has not been previously surveyed.

Table 1. Previous Surveys within a 1.6-km (1-Mile) Radius of the Project Area

ASM Project No.	Project Name/Description	Performing Institution	Report Reference
1976-1.ASM	Canada del Oro Sewer	Arizona State Museum	Brew and Rogge 1976
1979-35.ASM	Rancho Feliz	Arizona State Museum	Urban 1981a
1979-39.ASM	TG & E Northern Tucson Transmission Line Survey	Arizona State Museum	Rozen 1979
1980-150.ASM	Linda Vista Terrace	Arizona State Museum	Clearinghouse Project 80-85-0186, 0187
1981-50.ASM	Saddle Valley	Arizona State Museum	Urban 1981b
1981-174.ASM	The Northern Tucson Basin Survey: Phase I	Arizona State Museum	Madsen et al. 1993
1984-19.ASM	Broadmoor Project Archaeological Exploration	Center for Archaeological Field Training	Stephen 1984
1994-279.ASM	Oracle-Tucson 115-kV Transmission	Western Cultural Resource Management	Brown and Rohman 1994
1996-22.ASM	Overton Road Survey	Tierra Right of Way Services, Ltd.	Carpenter 1996
1996-433.ASM	Owl Head Survey	Tierra Right of Way Services, Ltd.	Tompkins 1996
1997-102.ASM	La Cholla/Lambert	Professional Archaeological Services & Technologies	Stephen 1997
1998-114.ASM	Casa Adobes Wash Survey	SWCA Environmental Consultants, Inc.	Information not available
2000-24.ASM	Naranja Sewer Survey	Tierra Right of Way Services, Ltd.	Hayes 2000
2001-136.ASM	La Cholla and Overton Survey	Tierra Right of Way Services, Ltd.	Olsson and Klune 2001
2001-552.ASM	Well Sites	Professional Archaeological Services and Technologies	Stephen 2001
2001-583.ASM	Qwest Shannon	Engineering & Environmental Consultants	Fuller 2001
2002-330.ASM	La Canada/Lambert SEC	Professional Archaeological Services and Technologies	Stephen 2002

ASM Project No.	Project Name/Description	Performing Institution	Report Reference
2002-360.ASM	Oro Valley 40 Acre	Entranco, Inc.	Davis 2002
2003-7.ASM	Canada del Oro Wash Cultural Resource Survey	SWCA Environmental Consultants, Inc.	I. Hesse 2003
2003-22.ASM	Linda Vista Transmission Main Survey	SWCA Environmental Consultants, Inc.	J. Hesse 2003
2003-1378.ASM	Two-Parcel, ca. 7-Acre Cultural Resources Survey	Old Pueblo Archaeology Center	Jerla 2003
2004-18.ASM	Overton and La Cholla Survey	Tierra Right of Way Services, Ltd.	Moses 2004
2004-559.ASM	Canada del Oro Wash Trail Survey	SWCA Environmental Consultants, Inc.	Tucker 2004
2005-781.ASM	Shangri La Archaeological Survey	WestLand Resources, Inc.	Cook 2004
2005-1238.ASM	Alive Survey	Tierra Right of Way Services, Ltd.	Klimas 2005
2007-20.ASM	Oro Valley Phase 2 Reclaimed Water Project	SWCA Environmental Consultants, Inc.	Fahrni 2007
2008-295.ASM	Lambert Lane Survey	Harris Environmental Group	Harris Environmental Group, Inc. 2008
2008-538.ASM	Camino Del Sur Survey	Tierra Right of Way Services, Ltd.	Jones 2009
2009-324.ASM	Lomas del Oro Wash Repair and Stabilization	URS Corp.	Albush 2009
2010-29.ASM	La Cholla Blvd.	URS Corp.	Cox et al. 2010
2011-128.ASM	Atlas 0378	Aztlan Archaeology, Inc.	Slawson 2010
2011-440.ASM	Atlas 375 Survey	Tierra Right of Way Services, Ltd.	Doak 2011
2012-93.ASM	Atlas 663	Aztlan Archaeology, Inc.	Slawson 2012

Table 2. Previously Recorded Archaeological Sites within a 1.6-km (1-Mile) Radius of the Project Area

Site Number	Site Name/Description	Temporal Placement	NRHP Status
AZ AA:12:817(ASM)	three rock clusters	Ceramic (A.D. 200–500)	considered eligible by recorder
AZ AA:12:1092(ASM)	unknown	unknown	unknown
AZ AA:12:1093(ASM)	house ruins	Historic (A.D. 1500–1950)	not considered eligible by recorder
AZ BB:5:123(ASM)	Oracle-Tucson transmission line	Historic (A.D. 1500–1950)	determined not eligible by SHPO

Key: NRHP = National Register of Historic Places.

General Land Office (GLO) Map No. 1957 for Township 12 South, Range 13 East, G&SRB&M, filed November 23, 1915, was also examined for indications of historic properties within the 1.6-km (1.0-mile) buffer zone surrounding the project area (Figure 3). The map indicates no historic properties in the project area. Within the 1.6-km (1.0-mile) buffer, the map indicates an unnamed road to the west of the project area and the "Matt Lockas House" to the south. Both properties are located well outside the project area.

Please note that due to requirements by the ASM and AZSITE, the mapped locations of the previous projects and sites listed in Tables 1 and 2 are presented in Appendix A, which is detachable, in order to keep their locations confidential. The client copy of this report will have Appendix A removed, but all agency and ASM curation copies will retain Appendix A.

SURVEY EXPECTATIONS

It was expected that new sites could be found within the subject parcel, particularly given the project area's proximity to Cañada del Oro. Because site density in the vicinity is known to be relatively low, the probability of finding new sites was considered to be below average.

SURVEY METHODS

The survey was conducted by Tierra archaeologists Chance Copperstone, M.A. (field director), Joseph Howell (field technician), and Tom Robinson (field technician), on March 6, 2015. The survey was conducted in accordance with standards established by the ASM for pedestrian surveys on lands administered by the State of Arizona and its subdivisions. According to these standards, 100 percent coverage of an area can be claimed if the entire area is surveyed by crews walking transects spaced no more than 20 m (66 feet) apart across the entire project area. The project area was intensively inspected by walking transects spaced at 20 m (66 feet) or less within the designated project boundaries and inspecting the ground surface. Whenever potential cultural materials were located, the immediate surrounding area was carefully searched to determine the nature and size of the find. Subsequently, the find was designated as a site, an isolated occurrence, or disregarded as non-archaeological. The survey area was photographed, and methods and any findings were noted on standardized forms where applicable. Ground visibility was excellent.

Cultural properties identified during any survey are evaluated in accordance with standards established by the ASM for State-administered lands. These standards require a property to be at least 50 years old. For a property of sufficient age to be recorded as an archaeological *site*, it must consist of one of the following:

1. At least 30 artifacts of a single type (e.g., ceramics or lithics), representing the remains of more than a single episode of activity (e.g., the dropping of a single pot or the reduction of a single core into lithic artifacts);

2. At least 20 artifacts, of two or more types of artifact;

3. A single fixed feature, with any number of artifacts in association; or

4. More than one fixed feature, with or without associated artifacts.

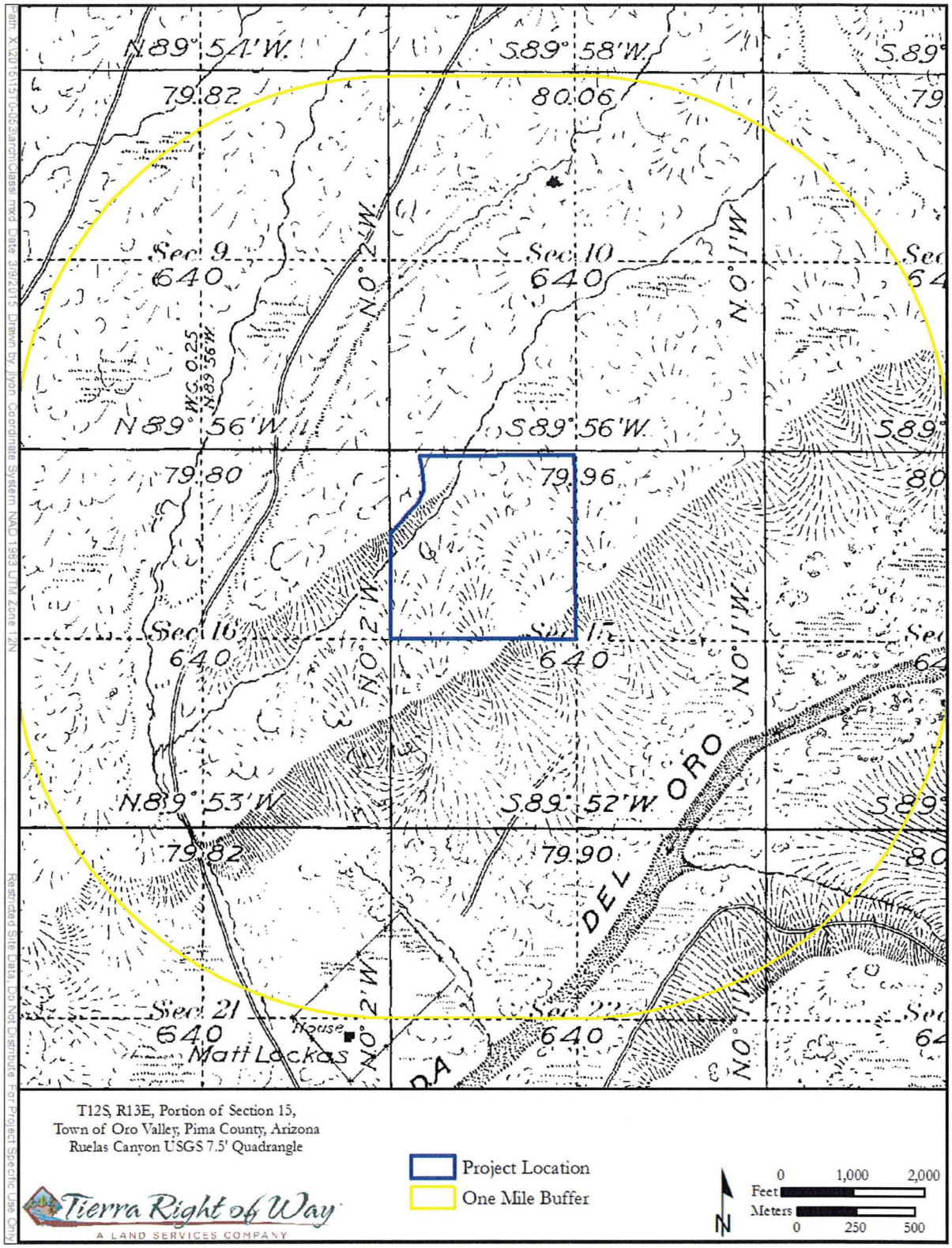

Figure 3. Copy of parts of General Land Office Map No. 1957 (Township 12 South, Range 13 East) showing the current project area and 1.6-km (1-mile) buffer.

A property of sufficient age that does not meet any of these criteria may be recorded as an *isolated occurrence*. However, if such a property is considered to be of particular interest for some other reason, it may also be recorded as a site at the discretion of the recorder. Examples of such isolated occurrences would include rare types of projectile points or significant historic features.

Cultural properties are further evaluated with regard to significance, which is assessed largely in terms of a property's eligibility for inclusion on the National Register of Historic Places (NRHP). As defined by Code of Federal Regulations Title 36, Part 60.2 (36 CFR 60.2), the NRHP is "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). Pursuant to 36 CFR 60.4, these are the criteria by which properties are evaluated:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> **A.** That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> **B.** That are associated with the lives of persons significant in our past; or
>
> **C.** That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> **D.** That have yielded or may be likely to yield, information important in prehistory or history (National Park Service 2004).

SURVEY RESULTS

No new or previously recorded sites were encountered during the survey. Two isolated occurrences were recorded (Figure B.1) and are described below and in Table 3.

IO 1 consists of a single plain ware sherd. The sherd is unpolished with sand and mica temper. It was observed in a small rill and may have washed down from the top of a low ridge. However, no additional sherds or other artifacts are located on the ridge.

Table 3. Isolated Occurrences

IO #	Cultural/Temporal Affiliation	Description	Location (UTM)
1	Hohokam (ca. A.D. 600–1450)	plain ware sherd	499281 E 3583381 N
2	prehistoric (ca. 12,000 B.C.–A.D. 1450)	quartzite core reduction flake	499369 E 3583699 N

IO 2 consists of a single quartzite core reduction flake with a cortical platform. The flake is located in the bottom of a wide, sandy ephemeral wash. No additional flakes were observed.

SUMMARY AND RECOMMENDATIONS

The project area was surveyed on March 6, 2015, by Tierra archaeologists. The primary purpose of this archeological survey was to discover and document prehistoric and/or historic properties that might be affected by the proposed development. Only two isolated occurrences were recorded. None of the isolated occurrences meet the criteria of significance for inclusion on the NRHP. Therefore, Tierra recommends that the proposed undertaking will have no impact and that the project be allowed to proceed without further archaeological work required.

The client and all subcontractors are also reminded that, in accordance with Section 41-865 of the Arizona Revised Statutes, if human remains are encountered anywhere in the survey area during any subsequent ground-disturbing activities, these activities shall cease in the area of the discovery and the Director of the ASM shall be immediately notified. All ground-disturbing activities in the immediate vicinity of the discovery shall cease until a qualified archaeologist assesses the remains. Work in and around the area shall not resume until so directed by ASM personnel.

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APPENDIX A

Class I Research

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resources Survey of 61 ha (143 Acres) near the Southeast Corner of La Cholla Boulevard and Lambert Lane, in the Town of Oro Valley, Pima County, Arizona

Public disclosure is prohibited by ARS §39-125.

APPENDIX B

Survey Results

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resources Survey of 61 ha (143 Acres) near the Southeast Corner of La Cholla Boulevard and Lambert Lane, in the Town of Oro Valley, Pima County, Arizona

Public disclosure is prohibited by ARS §39-125.

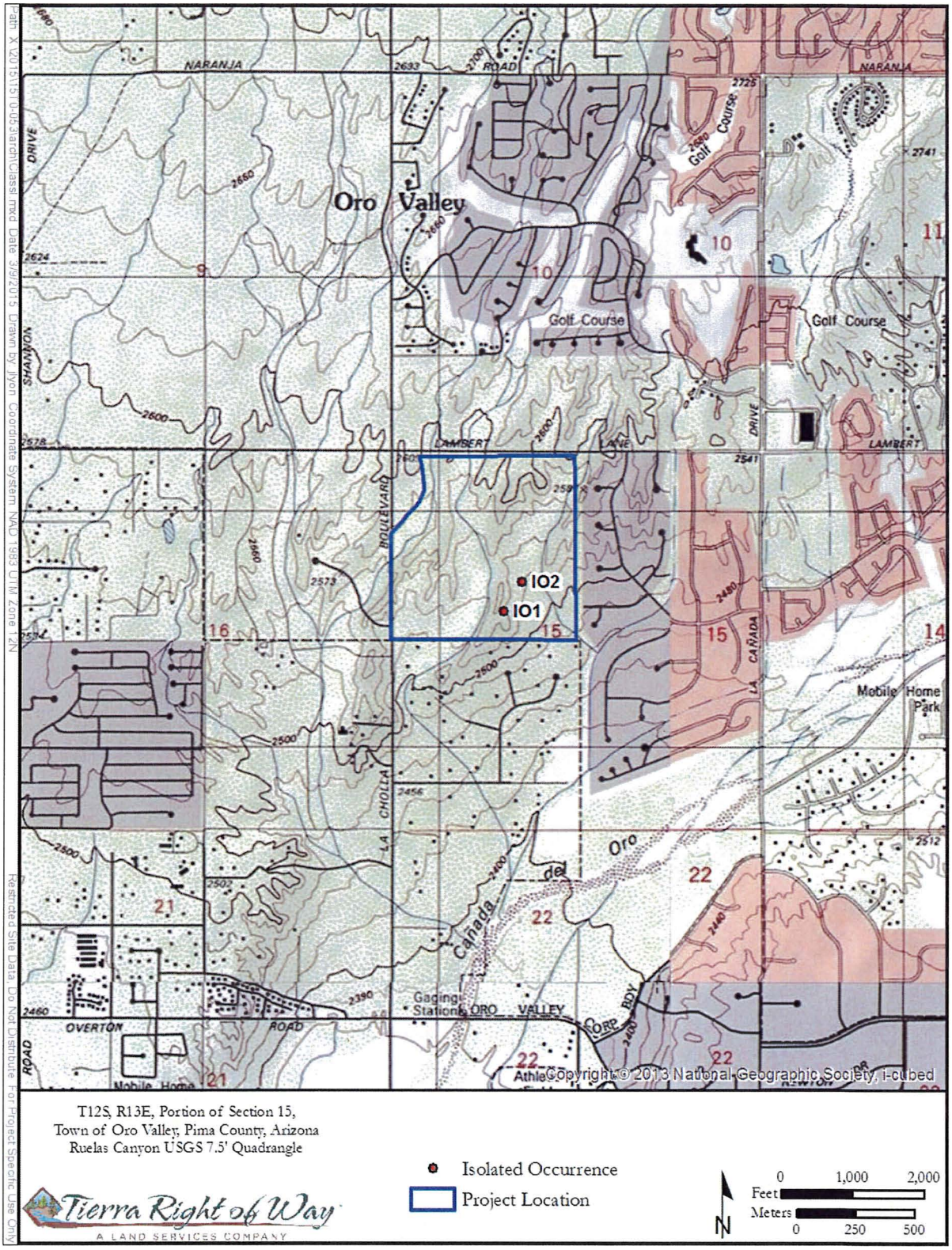


Figure B.1. Project area with locations of isolated occurrences.

APPENDIX C. SURVEY REPORT SUMMARY FORM

STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM
(SURVEY REPORT ABSTRACT)

For detailed instructions on using this form see *SHPO Guidance for Use and Submittal of the Survey Report Summary Form (SHPO Guidance Point No. 10).*

I. REPORT TITLE (whether technical report or SRSF only submitted)

Report Title: A Class III Cultural Resources Survey of 61 ha (143 Acres) near the Southeast Corner of La Cholla Boulevard and Lambert Lane, in the Town of Oro Valley, Pima County, Arizona

Report Author(s): Joseph Howell

Date: March 13, 2015 **Report No.:** 2015-012 ☐ **Check if this submittal is SRSF for Negative Survey**

II. AZSITE & SHPO INFORMATION

ASM Accession Number: none **AAA Permit No.:** 2015-25bl **SHPO**-20__-_____ (if known)

Project Locator UTMs: 499201 **mE** 3583843 **mN** **Zone:** 12 **NAD 83**

USGS 7.5' Quadrangle Name: Ruelas Canyon, Arizona (1992)

III. CONSULTING FIRM INFORMATION

Organization/Consulting Firm: Tierra Right of Way Services, Ltd.

Internal Project Number: 15T0-023

Contact Name (Responsible Person*): Tom Euler/Barbara Montgomery

Address: 1575 East River Road, Suite 201, Tucson, AZ 85718

Phone: (520) 319-2106 **Email:** teuler@tierra-row.com/bmontgomery@tierra-row.com

*Responsible person – Preferably cultural resources manager/project director or principal investigator.

IV. AGENCY/PROJECT INFORMATION

Lead Agency/Project Number: Town of Oro Valley

Agency Project Name/Number: /

Route, Mileposts Limits (ADOT projects): /

Nearest City/Town & County: Oro Valley

Address (if appropriate, *e.g.,* cell tower projects):

Project Sponsor: Future Arizona, Inc.

Funding Source(s): Private **(Federal, State, and/or Private)**

STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM
(SURVEY REPORT ABSTRACT)

Other Permitting/Land Agencies & Permit Numbers: Pima County

ASLD Lease Application No.:

V. PROJECT DESCRIPTION (What does the project entail? If known, describe the proposed ground-disturbing activities (both surface and subsurface), as well as the purpose of the survey): Housing development. The parcel was surveyed in anticipation of the development to determine if any cultural resources were present that may be adversely affected by the project.

VI. AREA OF POTENTIAL EFFECTS (APE)/PROJECT AREA DESCRIPTION (provide dimensions, right-of-way or easement, etc. For FCC projects, describe both the physical footprint and the visual APE): The project area consists of 61 ha (143 acres) at the southeast corner of La Cholla Boulevard and Lambert Lane.

VII. PROJECT AREA INFORMATION

Total Acres: 143 **NAD 83; Zone:** 12; **Meridian:** Gila and Salt River Baseline and Meridian

Justification for areas not surveyed (identify land jurisdiction):

Project Location (expand as necessary).

Land Jurisdiction	Legal Description (T, R, Q, S)	Acres Surveyed	Acres Not Surveyed
Private	T12S, R13E, NW ¼ Sec. 15	143	0

VIII. INVENTORY CLASS COMPLETED

Note: Previous survey within APE must meet current standards or new survey is required; see SHPO Guidance Point No. 5 for assistance in evaluating whether a survey older than 10 years needs is still adequate.

☐ **Class I Inventory only** ☒ **Class III Intensive Field Survey**

☐ **Other: Identify and provide justification:**

IX. CLASS III SURVEY PERSONNEL AND METHODS

Field Personnel (Include Years of Archaeology Experience in Arizona; not necessary to repeat this in technical report)

STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM
(SURVEY REPORT ABSTRACT)

Project Principal Investigator: Barbara Montgomery (30 years)

Project Director/Field Supervisor: Chance Copperstone (10 years)

Crew: Tom Robinson (8 years), Joseph Howell (24 years)

Date(s) of Fieldwork: March 6, 2015

Methods & Area Surveyed: Must meet minimal land management standards and adjust for field conditions.

Linear Miles; transect intervals m apart Coverage (%):

143 **Acres Block Survey; transect intervals** 20 **m apart Coverage (%):** 100

Site recording criteria used [e.g., ASM, other (identify)]: Arizona State Museum

Ground Surface Visibility: Adequate

Integrity of Survey Area Current condition; include disturbances, erosion, flooding, dense vegetation, etc.: Nearly pristine desert; only major erosion in deep-cut washes; vegetation healthy but not overly dense.

X. CULTURAL RESOURCES

☐ **No cultural resources identified**

☒ **Isolated occurrences only** **Number of IOs recorded:** 2

☐ **Archaeological sites present; site summary table attached**

Number of Previously Recorded Sites:

Number of Newly Recorded Sites:

Number of Sites Not Re-located:

☐ **Historic period buildings/structures etc. documented/evaluated; historic property inventory forms attached**

Note: Historic property (non-archaeological site) evaluations must be completed by qualified personnel (historian, architectural historian); please identify and include years of relevant experience:

RECOMMENDATIONS

Discuss impacts to historic properties and proposed recommendations for avoidance and/or treatment. For FCC projects, separately discuss impacts to historic properties within the visual APE: Only two isolated occurrences were recorded. None of the isolated occurrences meet the criteria of significance for inclusion on the NRHP. Therefore, Tierra recommends that the proposed undertaking will have no impact and the project be allowed to proceed without further archaeological work.

STATE HISTORIC PRESERVATION OFFICE
SURVEY REPORT SUMMARY FORM
(SURVEY REPORT ABSTRACT)

Recommended Finding of Project Effect

☒ **No Historic Properties Affected**

☐ **No Adverse Effect**

☐ **Adverse Effect**

***Final Draft Report Reviewed By (Consultant):**

Reviewer's Name	Title	Years Experience
Barbara K. Montgomery	Senior Principal Investigator	30

***Not necessary to repeat this information in the technical report.**

CONSULTANT CERTIFICATION (Signature of Responsible Party, All Technical Report/SRSF submittals)

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

Barbara K. Montgomery

Signature

Date: March 12, 2015

Senior Principal Investigator

Title

Rezoning southeast corner of Lambert/La Cholla
Planning and Zoning Commission Staff Report

PROJECT: Rezoning southeast corner Lambert Lane/La Cholla Boulevard (Fasseas)

CASE NUMBER: OV914-009

MEETING DATE: February 2, 2016

AGENDA ITEM:

STAFF CONTACT: Michael Spaeth, Senior Planner
mspaeth@orovalleyaz.gov (520) 229-4812

Applicant: The WLB Group Inc., Paul Oland

Request: Rezoning of an approximately 142-acre property from R1-144 to R1-43 and use of the minimum lot size, building height and modified review process Flexible Design Options.

Location: Southeast corner of Lambert Lane and La Cholla Boulevard

Recommendation: Recommend approval subject to the conditions in Attachment 1.

SUMMARY:

The applicant proposes a rezoning from R1-144 to R1-43 for an approximately 142-acre property located on the southeast corner of Lambert Lane and La Cholla Boulevard. The Tentative Development Plan, included in Attachment 2, proposes:

- Ninety-one (91) single-family homes with a minimum lot size of 10,000 square feet.
- Preservation of over 75% of the site as open space, including an approximately 425 foot setback along the eastern property line and a 150 foot setback along the southern property line to serve as buffers between the subject property and neighboring residential development.
- Pedestrian and Equestrian trails and trailheads throughout the site.
- Two points of ingress/egress with access to Lambert Lane and La Cholla Boulevard.

The character of the La Cholla Corridor will be different in the future as a result of two key changes, a summary of which is provided below:

1) The widening of La Cholla Boulevard

- Roadway is currently in the design phase and is anticipated to be completed in June 2019
- Upon completion, traffic volumes are expected to increase 200%
- One of only two north-south Major Arterial roadways in Oro Valley

2) Town Council approval of the La Cholla/Naranja Major General Plan Amendments
    - Increased residential densities along La Cholla Boulevard with lot sizes similar to those of the existing residential north toward Tangerine Road
    - Concentrated commercial at the intersection of Lambert and La Cholla

Though the roadway widening is anticipated to be completed in the summer of 2019, many of the land use changes won't occur in the near future, but rather in five or ten years. Any development proposals within the corridor need to account for these future land use and transportation changes.

The public participation process has been extensive. In addition to five neighborhood meetings, Town staff and the applicant have held numerous informal meetings with concerned neighbors regarding the applicant's proposal. Staff has received legal protest letters from several property owners adjacent to the proposed rezoning. In accordance with State Law and the Zoning Code, sufficient protest has been received to require a super-majority (6-1) vote of Town Council for approval.

BACKGROUND:

Land Use Context

The Location Map, General Plan Land Use Map and Zoning Map for the property and the surrounding area is depicted in Attachments 3, 4 and 5 respectively.

Approvals to Date

- R1-144 zoning was established upon annexation of the property in 2002.
- There have been no approvals to date on the subject property

Regional Transportation and Land Use Changes

The character of the La Cholla Corridor is changing. Several transportation and land use changes will occur that will fundamentally impact the area. Many of these changes will not occur in the short term, but rather in the long term over the next five or ten years. The appropriateness of the applicant's proposal takes into consideration the nature and anticipated timeframes of these changes. A discussion is provided below of the key changes:

La Cholla Boulevard

The Regional Transit Authority (RTA) is currently in the design phase to improve La Cholla Boulevard to four-lanes from Overton Road (south of the subject property) north to Tangerine

Road with an anticipated completion date of June 2019. The significance of the roadway expansion is summarized in the details provided below:

- The roadway is currently one of only two north-south roadways designated as Major Arterials in Oro Valley, the other being Oracle Road. La Cholla Boulevard has always been considered the alternative north-south route as traffic congestion on Oracle Road continues to increase.
- The traffic volume on La Cholla Boulevard is expected to rise approximately 200% by 2040 according to the RTA. The road will function not only as an alternative to Oracle Road, but as the primary roadway for many Oro Valley residents, surpassing even La Cañada Drive.
- La Cholla Boulevard will highly resemble La Canada Drive with four-lanes separated by a landscaped median with pedestrian improvements.

Ultimately, the widening of La Cholla Boulevard is expected to impact land use patterns throughout the area. Typically, an intensification of land uses follows transportation changes such as the widening of a roadway, as an increase in traffic volume supports the land use change.

<u>La Cholla Corridor Land Use</u>

In May 2015, Town Council approved a Major General Plan Amendment for an area encompassing approximately 190 acres northwest of the subject property (see Attachment 6). The scope of the Amendment included:

- Increased residential densities for many of the properties adjacent to La Cholla Boulevard with lot sizes similar to those of the existing residential north toward Tangerine Road which are as small as 7,000 sq. ft. (see Attachment 7).
- Concentration of commercial near the Lambert Lane and La Cholla Boulevard intersection. Currently, two corners of the intersection (northeast and northwest) have neighborhood or regional commercial land use designations and a third (southeast) is expected to be commercial in the future as well.

In sum, the widening of La Cholla Boulevard and the concentration of commercial near the intersection supports an increase in density for the subject property based on the anticipated changes of the character of this area. The applicant's proposed Tentative Development Plan (TDP) represents an increase in residential density that will make more efficient use of the planned infrastructure expansion and help support the future commercial.

DISCUSSION/ANALYSIS:

The applicant proposes to rezone approximately 142 acres from R1-144 to R1-43 to develop a 91-lot residential subdivision. The Tentative Development Plan (TDP) includes:

- Ninety-one (91) single-family homes with a minimum lot size of 10,000 square feet. Many of the most visible homes to neighbors have been restricted to single-story to reduce any potential visual impacts.
- Preservation of over 75% of the site as open space, including an approximately 425 foot setback along the eastern property line and a 150 foot setback along the southern property line to serve as buffers between the subject property and neighboring residential development.
- Pedestrian and Equestrian trails and trailheads throughout the site.
- Two points of ingress/egress providing access to both Lambert Lane and La Cholla Boulevard.
- Regional drainage improvements.

Rezoning applications are reviewed for conformance with the General Plan, including the Land Use Map, and the Vision, Goals and Policies and the Town of Oro Valley Zoning Code.

General Plan Conformance Analysis

The applicant's request has been reviewed for conformance with the General Plan Land Use Map, Vision, Goals and Policies.

The subject property is designated as Low Density Residential (0.4 – 1.2 homes per acre) on the General Plan Future Land Use Map. As detailed above, the applicant is proposing 91-lots on approximately 142 acres, representing a density of approximately 0.64 homes per acre. The proposed Tentative Development Plan is consistent with the General Plan Land Use Map.

The applicant's proposal is consistent with the Vision and Goals and Policies of the General Plan, specifically those related to:

- Environment
- Community Design
- Transportation
- Infrastructure

A detailed analysis is provided in Attachment 8.

Zoning Code Analysis

The application has also been reviewed for conformance with the Town of Oro Valley Zoning Code and the specific development standards of the R1-43 zoning district. In summary, the applicant's proposal is consistent with the proposed zoning district and a detailed analysis of the applications conformance is provided in Attachment 9. A discussion of several key Zoning Code issues is provided below.

Drainage

Drainage has been one of the foremost concerns for neighbors throughout the process. Generally, Town standards require an applicant to design a drainage concept that results in

post-development runoff being equal to pre-development runoff. In other words, not increasing or decreasing the existing amount of runoff to downstream property owners. Presently, the existing drainage patterns in the area, without the applicant's proposed development, have been problematic for downstream property owners and improvements are needed.

The applicant has developed a drainage concept that will result in a significant decrease in the amount of runoff from the site to help alleviate some of the existing drainage issues within the area. A condition has been included in Attachment 1 that requires the applicant to reduce the post-development outflow to a level which has the effect of making the downstream property owners eligible for removal from the existing FEMA floodplain. Town staff will continue to work with the applicant to address the existing drainage issues in the area.

Environmentally Sensitive Lands (ESL)

Rezoning applications are required to comply with the requirements of the Environmentally Sensitive Lands (ESL) section of the Zoning Code. One of the primary objectives of the ESL requirements is the preservation of Environmentally Sensitive Open Space (ESOS) and other natural corridors. The subject property is characterized by several unique environmental constraints that limit the developable area, including:

- Significant hillsides and slopes. Approximately 29% of the site has regulated slopes in excess of 15% (see Exhibit E-2 in Attachment 2).
- Three washes, each designated as mapped FEMA floodplains (see Exhibit G in Attachment 2).

As a result of the environmental constraints of the site, the applicant's proposal uses a conservation subdivision design to protect environmental resources. The proposed subdivision represents a true conservation subdivision design by clustering the proposed homes away from neighboring properties and preserving approximately 75% of the site as contiguous open space. The amount of preserved open space is substantially more than the minimum required amount of Environmentally Sensitive Open Space as required in Table 27.10-2 (see Exhibit S in Attachment 2).

A condition has been added to Attachment 1 requiring the proposed roadway crossing over the Lomas de Oro wash to be constructed as a wildlife permeable bridge to maintain the integrity of the Critical Resource Area. With the condition, the applicant's proposed rezoning will be in conformance with the Environmentally Sensitive Lands standards.

A detailed analysis of the applications conformance with the Environmentally Sensitive Lands requirements is provided in Attachment 10.

Flexible Design Options

The Environmentally Sensitive Lands section of the Zoning Code enables the use of incentives, or flexible design options, for conservation subdivision designs. Flexible Design Options:

- Encourage the preservation of additional natural open space
- Allow the applicant to develop the same number of lots as permitted under the base zoning district.
- Are available to development when Environmentally Sensitive Open Space (ESOS) is applied to 25% or more of the property. As discussed previously, the applicant's proposal provides approximately 75% ESOS.

To achieve this level of open space preservation the applicant is proposing to use the following Flexible Design Options which require Town Council approval:

- Minimum Lot Size (a reduction from 43,560 sq. ft. to 10,000 sq. ft., 80% of the lots will have a minimum ½-acre) – Reduced lot sizes are necessary as a result of an increased amount of contiguous open space. The additional open space will also serve as a considerable buffer for neighbors, ranging from a minimum 150 feet for neighbors to the south to over 400 feet for neighbors to the east.
- Building Heights (an increase from 18 feet to 20 feet for one-story and 28 feet for two-story) – Increased building heights are often necessary when lot sizes are reduced to account for the reduced building footprint as a result of smaller lots. The increased building heights will not have an impact on existing views as much of the site is lower than neighboring properties. Furthermore, many of the homes are situated between ridgelines that will serve to screen the homes from adjacent properties.
- Modified Review Process – The Modified Review Process allows a rezoning application that has been exhaustively reviewed to proceed directly to the Final Site Plan stage of the review process. The public participation process has been extensive regarding the applicant's proposal. Due to the extent of design and mitigation that has already been accomplished, additional neighborhood meetings or public hearings would not be expected to significantly impact the overall design of the proposed subdivision.

The applicant has also requested the use of additional Flexible Design Options intended to conserve additional open space. These include the following which have been approved administratively, as enabled by the Zoning Code:

- Internal building setbacks – Similar to building heights, when lot sizes are reduced a reduction in building setback is required as a result of the smaller lot.
- Native Vegetation Preservation – The proposed Tentative Development Plan preserves approximately 75% of the site as Environmentally Sensitive Open Space, ensuring these areas will be left as natural open space.
- Recreation Area – The proposed recreation area amenities include trails and trailheads, both of which are consistent with the permitted uses in Environmentally Sensitive Open Space.

A discussion and analysis of the applicant's requested flexible design options is provided in Attachment 11.

Engineering

Drainage

The proposed rezoning request acknowledges the development will be designed so post-developed drainage conditions are consistent with pre-developed conditions in accordance with Town requirements. Three natural washes affect the subject property, flowing in a southerly direction through the development. All three washes have a FEMA Special Flood Hazard Area designation of "Zone A". A detailed drainage analysis was prepared by the applicant to determine the existing 100-year stormwater runoff values flowing through each wash.
The drainage system for the project shall be designed to ensure, among other requirements, that all proposed habitable structures adjacent to a wash will be protected from flooding and erosion. The increase of runoff resulting from constructed impervious surfaces will be mitigated by use of detention basins which discharge into the existing watercourses. The detention basins capture, hold, and release stormwater in a controlled manner to mimic existing conditions.

In addition to ensuring post-developed run-off does not exceed pre-developed levels, the applicant has proposed to control runoff exiting along the southern property line and contain the existing runoff that currently impacts downstream residences. Town staff supports this approach as it provides a benefit to downstream neighbors by alleviating existing flood conditions. A condition has been included in Attachment 1 to address drainage within the area.

Traffic:

The applicant's proposal provides two points of ingress/egress. The first is an access point proposed to connect to La Cholla Boulevard. There are existing sight visibility safety issues related to this location which will be mitigated by the future La Cholla Boulevard widening project. However, if this development moves forward prior to the La Cholla Boulevard widening project, the applicant will be required to construct a controlled access intersection (e.g. right-in/out only) or make other improvements to provide sufficient sight visibility for motorists.

The second access point is proposed to connect to Lambert Lane. Both access points will require off-site left turn-lane improvements to serve the new development. This development will generate an amount of traffic that is similar to other subdivisions located north along La Cholla Boulevard. The existing roadway network has existing capacity to accommodate the small increase in traffic volume, especially once the La Cholla widening project has been completed.

PUBLIC PARTICIPATION:

The public participation process has been extensive and productive. Five neighborhood meetings (3 traditional, 1 open house, 1 site visit) have been held concerning the applicant's proposal. Neighborhood meeting summaries have been provided as Attachment 12.

In addition to neighborhood meetings, the applicant and staff have met with concerned neighbors on several occasions. Through the process, the applicant and some of the neighbors have been able to forge consensus on numerous key issues (see Attachment 13). A discussion of the primary issues throughout the process and how the applicant has addressed them are listed below:

Drainage

As discussed previously, the existing drainage pattern surrounding the subject property has been a primary concern for neighboring property owners. After hearing from residents, the applicant has developed a methodology for not only addressing on-site drainage, but also improving off-site drainage throughout the area. A condition has been included in Attachment 1 to address the existing drainage within the area.

Building Height

Concerns were raised regarding the impact to surrounding property owners from two-story homes. The applicant conducted a site visit with neighbors to view “story” poles representing the proposed building heights for both one and two-story homes.

After receiving feedback from residents, the applicant has restricted many of the most visible lots to single-story and moved a number of homes away from existing residential to provide additional buffer.

Neighborhood Compatibility

Neighborhood residents have consistently voiced concern regarding the compatibility of the smaller lot sizes proposed by the applicant.

To address neighbor concerns, the applicant has substantially reduced the total number of lots (152 to 91) and increased the minimum lot size (minimum 10,000 sq. ft. with 80% minimum ½-acre). Previously, the applicant had moved homes away from existing residential and realigned the roadway accessing Lambert Lane to provide additional buffer for neighbors.

Staff has received additional correspondence concerning the applicant’s proposal which has been provided in Attachment 14.

Staff has also received several formal letters of protest which have been provided in Attachment 15. In accordance with State Law and the Zoning Code, a sufficient number of formal letters of protest have been received that will require a super-majority vote (6-1) of Town Council for approval.

RECOMMENDATION:

Based on the following findings:

- The request is appropriate considering the planned infrastructure expansion of La Cholla Boulevard.
- The request is consistent with the character of future land uses within the immediate area and will support future commercial.
- The request is consistent with the General Plan Vision, Goals and Policies, as well as all applicable sections of the Zoning Code,
- The Tentative Development Plan preserves a majority of the site's open space and wildlife corridors;
- The Tentative Development Plan, with the conditions listed in Attachment 1, improves the existing drainage within the immediate area.
- The public participation process has been extensive and resulted in tangible revisions to address neighbor concerns.

It is recommended that the Planning and Zoning Commission take the following action:

Recommend approval to Town Council of the proposed rezoning (OV914-009) and use of the requested Flexible Design Options including minimum lot size, building height and modified review process, as provided on Attachment 1.

SUGGESTED MOTIONS:

I move to recommend approval of the proposed rezoning from R1-144 to R1-43 and use of the requested Flexible Design Options including minimum lot size, building height and modified review process based on the findings in the staff report, subject to the conditions in Attachment 1.

OR

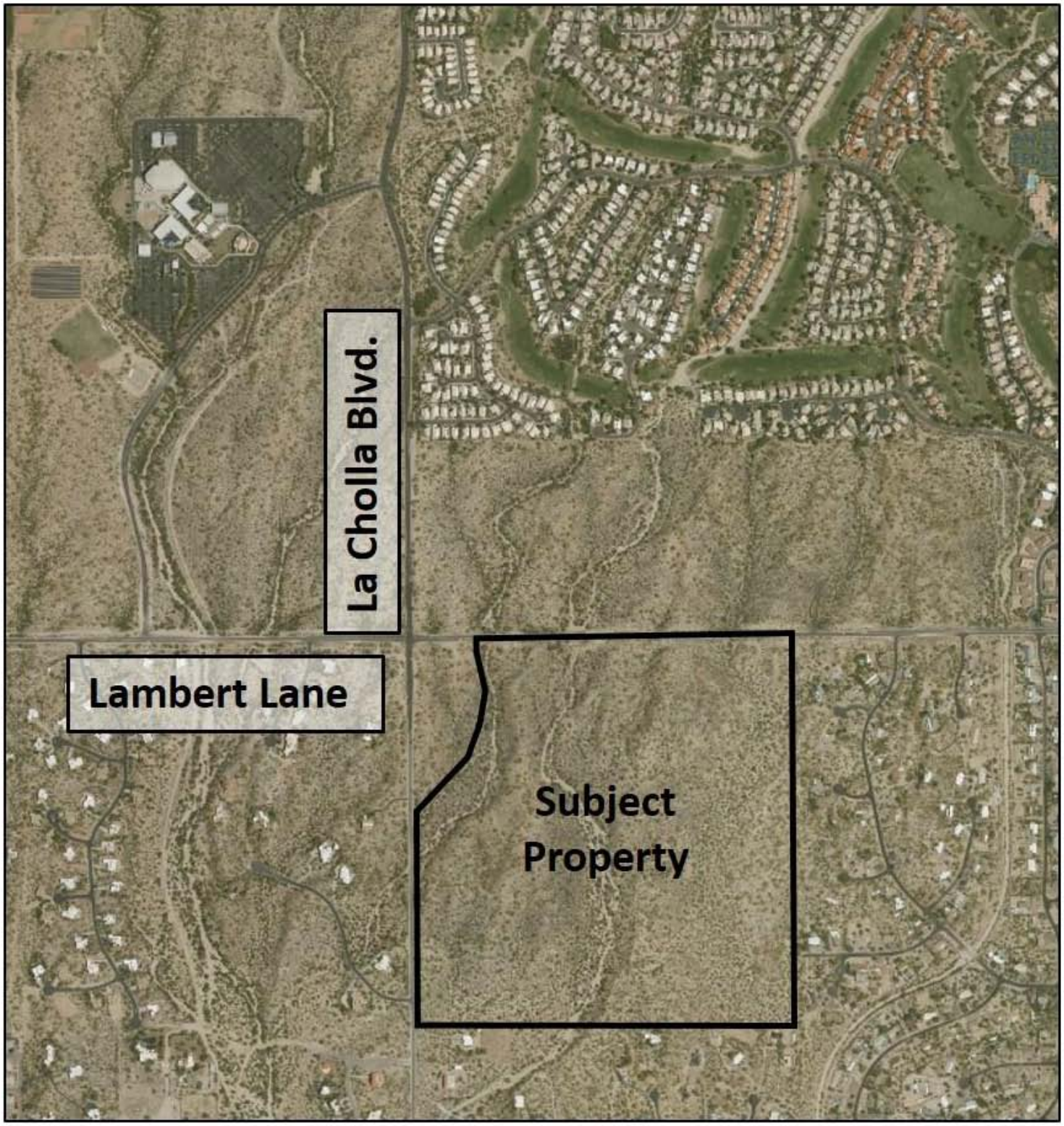
I move to recommend denial of the proposed rezoning from R1-144 to R1-43 and use of the requested Flexible Design Options, based on the findings _____.

ATTACHMENTS:

1. Conditions of Approval
2. Site Analysis and Tentative Development Plan
3. Location Map
4. General Plan Land Use Map
5. Zoning Map
6. La Cholla and Naranja Conceptual Land Use Plan
7. La Cholla Corridor Average Lot Sizes
8. General Plan Conformance Analysis
9. Zoning Analysis

10. Environmentally Sensitive Lands Analysis
11. Flexible Design Options Analysis
12. Neighborhood Meeting Summaries
13. Neighborhood Consensus Summary
14. Resident Correspondence
15. Formal Letters of Protest

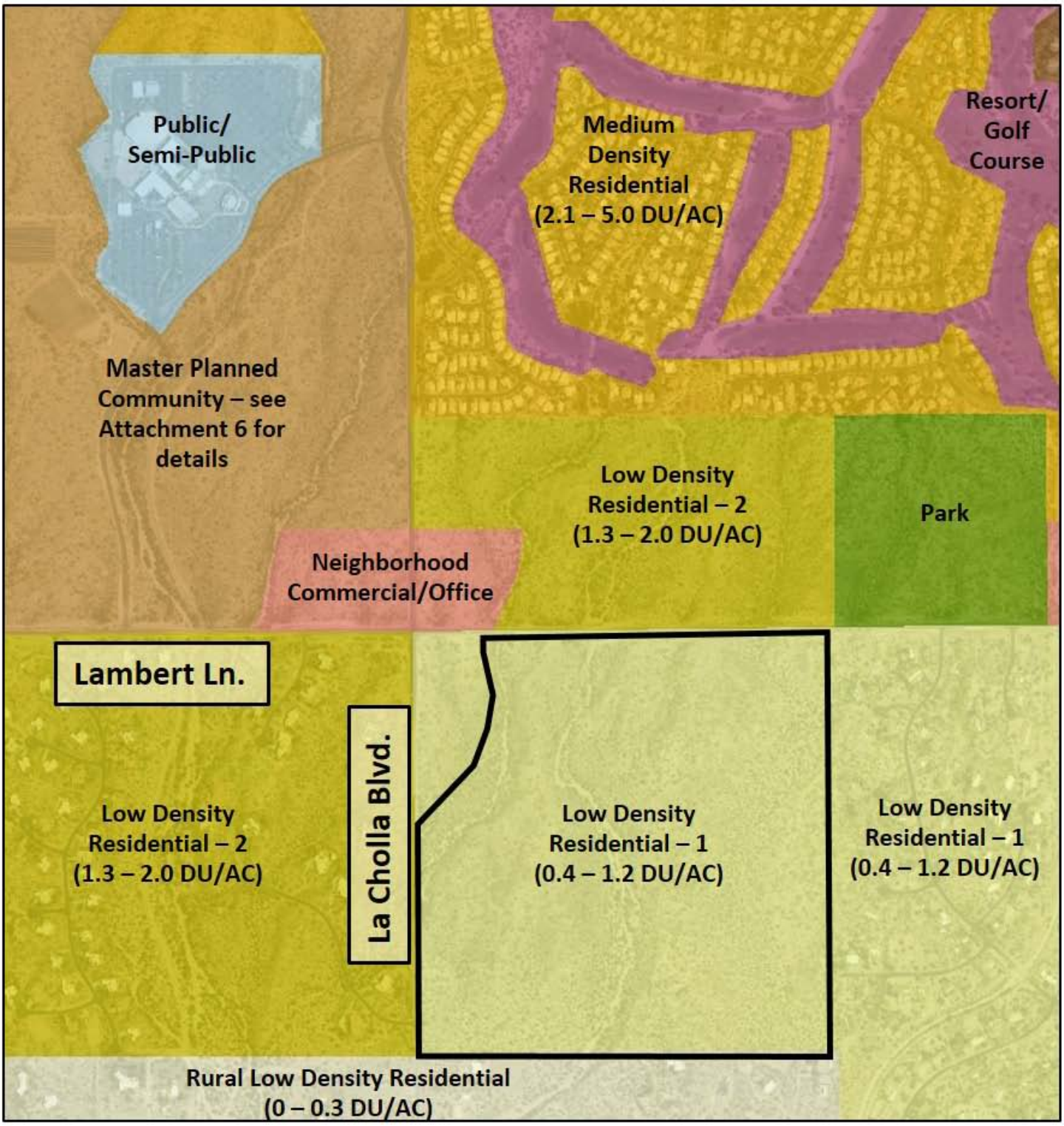
_____
Bayer Vella, Planning Manager



LOCATION MAP

SOUTHEAST CORNER LAMBERT AND LA CHOLLA
(OV914-009)

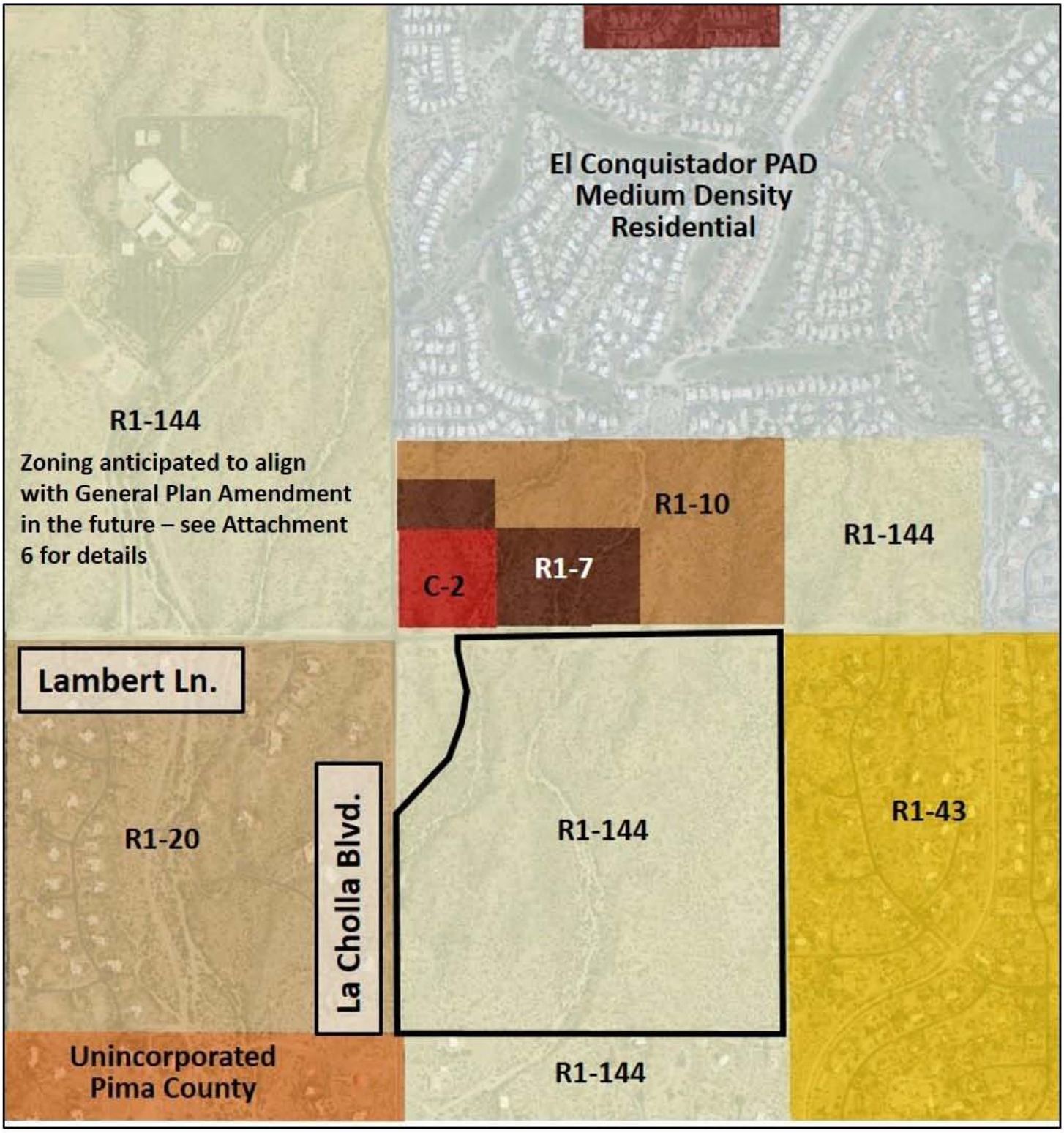
Attachment 3



GENERAL PLAN MAP

SOUTHEAST CORNER LAMBERT AND LA CHOLLA
(OV914-009)

Attachment 4



ZONING MAP

SOUTHEAST CORNER LAMBERT AND LA CHOLLA
(OV914-009)

Attachment 5

Attachment 8
General Plan Conformance Analysis
Southeast corner Lambert Lane and La Cholla Boulevard Rezoning
Planning and Zoning Commission
February 2, 2016

General Plan Conformance Analysis

The subject property is designated as Low Density Residential (0.4 – 1.2 homes per acre) on the General Plan Future Land Use Map.

The Low Density Residential (0.4 – 1.2 homes per acre) General Plan land use designation is defined as:

"Areas where single-family detached residential development is desirable, but only if it is at a density that will permit retention of a rural open character. (0.4 – 1.2 du/ac)"

The applicant proposes an overall density of approximately 0.64 du/ac with approximately 75% open space preservation. This amount of open space preservation provides substantial buffers for neighbors and will permit the retention of a rural open character for the site. The applicant's proposal is consistent with the General Plan land use category.

General Plan Analysis

Rezoning applications are also evaluated for consistency with the Vision, Goals and Policies of the General Plan. The following section provides analysis relative to the consistency of the rezoning request with the General Plan Vision and key General Plan Goals and Policies. Excerpts from the General Plan are shown in italics, followed by staff comment.

General Plan Vision

To be a well planned community that uses its resources to balance the needs of today against the potential impacts to future generations. Oro Valley's lifestyle is defined by the highest standard of environmental integrity, education, infrastructure, services, and public safety. It is a community of people working together to create the Town's future with a government that is responsive to residents and ensures the long-term financial stability of the Town.

The applicant's proposal is consistent with the environmental requirements of the Environmentally Sensitive Lands requirements of the Zoning Code. The Tentative Development Plan preserves approximately 75% of the site as open space protecting the environmental integrity of the natural area of the site.

Additionally, the applicant has held numerous meetings with neighborhood residents and instituted a number of revisions to respond to many of the concerns from the neighborhood. The proposed rezoning is consistent with the General Plan Vision.

General Plan Goals and Policies.

Policy 1.1.1 *The Town shall promote clustering of development to protect environmentally sensitive areas and to preserve significant, passive use, natural open space within residential neighborhoods.*

The applicant's Tentative Development Plan proposes preservation of 75% of the property's natural open space. The subdivision design serves as a true example of a cluster subdivision protecting the environmentally sensitive areas. The applicant's proposal meets this General Plan Policy.

Policy 1.1.3 *The Town shall continue to avoid development encroachment into washes, riparian areas, designated open space and environmentally sensitive lands.*

The applicant's Tentative Development Plan clusters development away from the environmentally sensitive areas of the site, including the washes and riparian areas. The applicant has worked with environmental groups to preserve the wildlife corridors as much as possible. A 300-foot corridor is maintained surrounding the main wash on the property, Lomas del Oro, including a bridge designed to span the wash to limit encroachment. A condition has been added to Attachment 1 requiring the design of the bridge to be wildlife permeable. The applicant's proposal is consistent with this policy.

Policy 1.1.4 *The Town shall commit to preserve, protect, and enhance the visual qualities of Oro Valley and surrounding visually significant areas, such as ridgelines.*

The natural topography of the site ensures the proposed Tentative Development Plan will have a reduced impact on offsite view sheds and view corridors throughout the area. The clustering of the homes respects the ridgelines and areas with significant slopes throughout the property. The applicant's proposal is consistent with this General Plan Policy.

Policy 1.2.1 *The Town shall maintain Oro Valley's predominately low-density character while considering the needs of financial stability and infrastructure efficiency.*

The planned expansion of La Cholla Boulevard to a four lane desert parkway represents a significant public investment in infrastructure to serve this area. The proposed increase in planned intensity will promote the efficient use of this expanded infrastructure.

Policy 2.1.4 *The Town shall require that all development proposals depict an arrangement of and massing of buildings and/or arrangement of lots to minimize impacts on views from adjacent properties…"*

The proposed Tentative Development Plan utilizes a conservation subdivision design, or cluster design, that results in arrangement of lots and homes that will have a negligible impact on existing views and will not be visible to a majority of existing adjacent properties. The applicant's proposal is consistent with this policy.

Policy 5.4.1 *The Town shall maintain a harmonious relationship between urban development and development of the transportation network.*

The proposed Tentative Development Plan will be consistent with the future character of the La Cholla Boulevard corridor. Expansion of the roadway to a four lane parkway justifies a moderate increase in density along this corridor.

Policy 8.2.1 *The Town shall provide appropriate pedestrian, equestrian, and bicycle linkages between various elements of the open space system and between these elements and other community facilities.*

The applicant has worked with neighboring residents to provide pedestrian and equestrian opportunities throughout the site. The proposed Tentative Development Plan includes 5 trails and six trailheads serving those trails. The applicant's proposal is consistent with this Policy.

Policy 11.1.8 *The Town shall use natural open space preservation as one criterion in considering land use rezoning proposals. Developments shall utilize natural open space to comply with requirements for landscaped areas and buffer areas.*

The applicant's proposal meets this policy as follows:

- The applicant's proposal conserves approximately 75% of the site as Environmentally Sensitive Open Space.
- The Tentative Development Plan incorporates significant neighborhood buffers along the eastern (425 feet) and southern (150 feet) portions of the site.
- The level of open space preservation also ensures many of the existing wildlife corridors are maintained throughout the site.

Attachment 9
Zoning Analysis
Southeast corner Lambert Lane and La Cholla Boulevard Rezoning
Planning and Zoning Commission
February 2, 2016

Zoning Analysis

Rezoning applications are also reviewed for conformance with the Town of Oro Valley Zoning Code and the development standards of the R1-43 zoning districts. A discussion of the applications conformance with the proposed zoning districts is provided below.

The Residential (R1-43) zoning district is intended to allow for low density detached single-family residential development.

The applicant is concurrently requesting several Flexible Design Options enabled by the Environmentally Sensitive Lands section of the Zoning Code that may affect several development standards, including building heights, internal building setbacks and minimum lot size. Please refer to Attachment 10 for a discussion and analysis of the applicant's requested Flexible Design Options.

Subsequent submittals, including all conceptual site plans and conceptual architecture, will be required to be consistent with the applicable requirements of the Zoning Code. The following development standards are notable for this proposal:

Neighborhood Compatibility: The applicant's proposal has addressed neighborhood compatibility as follows:

- The proposed R1-43 zoning district is in compliance with the Low Density Residential – 1 Land Use Designation on the General Plan Map.
- Though the Tentative Development Plan proposes smaller lot sizes than the adjacent residential subdivisions, substantial buffers have been incorporated into the design. The applicant's proposal includes a 425 foot buffer from existing residential to the east and a 150 foot buffer from existing residential to the south.
- The proposed residential utilizes a conservation subdivision design that results in an arrangement of lots within the rolling terrain of the site that will not be visible to many adjacent properties. Where the proposed homes will be visible, single-story restrictions have been proposed.

Access/Circulation: The Tentative Development Plan has two points of ingress/egress providing access to both La Cholla Boulevard and Lambert Lane. The proposed driveways meet driveway spacing requirements and have been approved by Engineering.

Furthermore, numerous (5) trails have been provided that traverse the site along with 6 trailheads to foster a more pedestrian and equestrian friendly environment.

Attachment 10
Environmentally Sensitive Lands Analysis
Southeast corner Lambert Lane and La Cholla Boulevard Rezoning
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Conservation Categories (Biologically Based)

The riparian areas traversing the site are designated as Critical Resource Area (CRA) and Resource Management Area Tier 1 on the Town's Environmentally Sensitive Lands Planning Map. The table below outlines the required preservation percentage for both Conservation Categories and the amount provided as part of the Tentative Development Plan:

Conservation Category	Required Preservation	Provided Preservation
Critical Resource Area	95%	95.7%
Resource Management Area	66%	66.9%

The applicant's proposal is consistent with the open space requirements for both conservation categories.

Conservation Categories (Non-biologically Based)

Cultural Resources

The applicant submitted a letter from the Arizona State Museum (ASM) indicating that the subject property has been surveyed for cultural resources and there are no historic sites recorded on the property. A field survey in March 2015, identified two archaeological sites on the subject property, neither of which met the criteria of inclusion on the National Register of Historic Places.

Scenic Resources

The site is characterized by moderate grade changes throughout the property with several significant ridgelines traversing the property. The applicant's proposed homes are arranged in the less visible portions of the property that will not impact view sheds or view corridors of the Catalina Mountains. The applicant has provided a viewshed analysis of the site for the primary view sheds from adjacent areas. For additional information see Section I-F and Exhibits J and K for viewshed analysis.

Hillside Areas

The subject property numerous topographical constraints, including several significant ridges. The Tentative Development Plan does not propose development on ridgelines or any slopes greater than 15%. For additional information see Section I-B and Exhibit E-1 and E-2 for slope area analysis.

Attachment 11
Flexible Design Options Analysis
Southeast corner Lambert Lane and La Cholla Boulevard Rezoning
Planning and Zoning Commission
February 2, 2016

The applicant's requested flexible design options are included on pages 45 and 46 of Attachment 2. A discussion and analysis of each is provided below.

The following flexible design options are subject to Planning and Zoning Administrator approval. These options have been reviewed and approved administratively.

Building Setbacks (Internal)

The Tentative Development Plan depicts a Conservation Subdivision Design utilizing the lot reduction incentive. As a result of the reduced lot sizes, the applicant requested the following building setback reductions:

- Front: 10 feet for side entry garages (existing 30 feet)
- Side: 5 feet (existing 15 feet)
- Rear: 20 feet (existing 40 feet)

The reduced setbacks shall not result in on-lot driveway lengths that are less than twenty (20') feet, per Section 27.10.F.2.c.iii.a.2.

Recreation Area Credit

Environmentally Sensitive Lands Section 27.10.F.2.c.iii.j provides for passive and/or active recreational amenities located within environmentally sensitive open space to be credited toward the applicant's residential recreational area requirements as required by Section 26.5. However, open space connectivity must be maintained. The subject recreation areas do maintain connectivity with the site's ESOS and satisfy the location requirements of Section 26.5, Provision of Recreational Area.

Native Vegetation Preservation

Environmentally Sensitive Lands Section 27.10.F.2.c.iii.k provides for the Native Plant Salvage and Mitigation requirements (Section 27.6.B) to be waived within the development envelope when fifty (50%) percent or more of a site is preserved as environmentally sensitive open space. This modification does not apply to areas of distinct vegetation which are designated as Core Resource Area or native plants that are listed as threatened or endangered by the Endangered Species Act or highly safeguarded by the Arizona Department of Agriculture.

The applicant requested to waive the Native Plant Salvage and Mitigation requirements of Section 27.6B within development envelopes. The Tentative Development Plan provides approximately 75% ESOS, well in excess of the minimum required for this flexible design option.

The following flexible design options are subject to Town Council approval

Minimum Lot Size

The applicant has proposed a Conservation Subdivision Design utilizing the lot reduction incentive. The applicant's request is to reduce the minimum lot size to 10,000 sq. ft. in accordance with Section 27.10.F.2.d.iii.c. The applicant is concurrently proposing reduced lot widths below the minimum lot width of the R1-43 zoning district of 150 feet. A reduction in lot dimensions, including lot width, is necessary concurrent with the applicant's request to reduce the minimum lot size.

Building Height

The applicant is requesting a building height increase from 18 feet to 20 feet for single-story homes and 28 feet for two-story homes. To address neighbor concerns, the Tentative Development Plan restricts many of the most visible lots to one-story (see Attachment 2). The applicant's request does not interfere with view sheds of the Catalina Mountains and will not have a significant impact on view corridors. The proposed homes will also need to be in conformance with the two-story homes restrictions in Zoning Code.

Attachment 12
Neighborhood Meeting Summaries
Southeast corner Lambert Lane and La Cholla Boulevard Rezoning
Planning and Zoning Commission
February 2, 2016

Lambert/La Cholla Rezoning

Neighborhood Meeting

August 6, 2014

Approximately fifty neighbors and interested parties were in attendance, including Councilmember Hornat, Councilmember Snider, Councilmember Waters and several members of the Planning and Zoning Commission.

Principal Planner Chad Daines facilitated the meeting that included a brief presentation by Town staff discussing the Rezoning process, followed by a presentation by the applicant. A question and answer session followed the applicant's presentation, which is outline below.

Issues discussed included

Traffic

Which direction will traffic primarily flow?
Will the development have sidewalks?
What type of temporary road improvements will be put in place while awaiting the Lambert Lane widening project?

Development

What is the proposed density?
Who is the anticipated homebuilder?
What is the maximum building height?
What will be the impact on existing viewsheds?
What are the proposed number of lots?
How many homes are allowed under the current zoning?
Why does the access to Lambert need to be so close to the existing neighborhood to the east?
Why are homes being proposed on the ridges?
Why is the northwest corner of the property not included? What are the plans for that area?
A comment was made indicating a preference for the zoning to remain R1-144 (1 home per 3.3 acres)
Who is going to pay for the infrastructure improvements? School impacts?

What is the economic rationale for developing 154 new homes? Please provide additional details at next meeting.
How are setbacks measured?
What will be the price of the homes?
Will the subdivision be walled?
What would the impacts be if the zoning wasn't changed, compared to what is being proposed?
Will utilities be required to be underground?
Why is the southeast corner of the property not considered Critical Resource Area?
Will the homeowners need to have flood insurance?
Will the developer have to preserve any of the site during development?
What is the proposed lot size?
How big will the homes be?
Why are we discussing the details of the site when the rezoning hasn't been approved?
What is the primary driving force behind the rezoning?
Why is the applicant allowed to reduce the lot size below what is required by the Zoning Code?
Where else can you buy homes on 3.3 acres in Oro Valley?
A comment was made concerning the excessive amount of impact required for infrastructure to reach the "isolated" homes proposed in the northeast corner of the property.

<u>Environment</u>

A comment was made concerning the scarcity of water resources in the region, which needs to be taken into account.
What resources does the Environmentally Sensitive Lands protect?
What can be done to preserve the integrity of the washes and keep people out of them?

<u>Drainage</u>

What will happen to the floodplain and existing drainage after development occurs?
Will you be adjusting the floodplain limits during the process?
What type of detention/retention measures are proposed?

<u>Process</u>

Will there be any future neighborhood meetings?
A comment was made requesting additional elevations and topography maps at future meetings.
Why are there no comprehensive meetings planned for neighbors that include this project along with those proposed up and down La Cholla.
When will the Planning and Zoning Commission hearing occur?
Can we hold a meeting directly with the applicant to discuss specifics?

Principal Planner Chad Daines closed the question and answer session and thanked everyone for their time and comments. This concluded the neighborhood meeting.

Neighborhood Meeting Summary
Southeast Corner Lambert Lane and La Cholla Blvd.
Proposed Rezoning
December 1, 2014
6:00 – 7:30 PM
Casas Adobes Baptist Church, 10801 N La Cholla Boulevard.

1. Introductions and Welcome

Meeting Facilitator Chad Daines, Principal Planner, introduced the Oro Valley staff Michael Spaeth, Senior Planner, as project manager. Approximately 50 residents and interested parties attended the meeting, include Vice Mayor Waters and Councilmember Hornat and Planning and Zoning Commissioner Leedy.

2. Staff Presentation

Michael Spaeth, Senior Planner, provided a presentation that included:

- Overview of the 1st neighborhood meeting
- Applicant's request
- Existing zoning of the property, including development standards
- Review tools
- Environmental Constraints
- Environmentally Sensitive Lands and Conservation Subdivision Design
- Traffic impacts and submittal requirements
- Drainage impacts and submittal requirements
- Water availability
- Cultural Resources preservation requirements
- Impacts on Schools
- Review process
- Public participation opportunities

3. Applicant Presentation

Paul Oland from the planning firm WLB Group Inc., provided a presentation detailing the applicant's proposal, which included:

- Overview of project
- Revisions from 1st neighborhood meeting
- Drainage impacts
- Traffic impacts

4. Public Participation Exercise and Questions & Comments

Meeting facilitator, Chad Daines, introduce the Public Participation Exercise and the goal of reaching resolution on the outstanding concerns from the 1st neighborhood meeting. Project Manager, Michael Spaeth, listed the topics still outstanding from the previous meeting, which included:

- Drainage
- Traffic
- Neighborhood Compatibility
- Building Height
- Lot configuration
- Density
- Viewsheds
- Economic Justification

Mr. Daines asked the audience if they felt any additional topics should be listed. One additional topic was included:

- Utilities

Mr. Daines asked the applicant to address each one of the topics listed. After each topic, Mr. Daines asked if there were additional questions from the audience. Following is a summary of additional questions and comments:

<u>Drainage</u>

- Has anyone on the applicant's team visited the site during a major rain event?
- Why isn't more engineering provided at this point in the process?
- Is the applicant permitted to add landscaping to the Critical Resource Area?
- How long would the water take to drain from the retention/detention basins?
- How will your proposal improve downstream drainage?
- Why is the easternmost wash not identified as a protected riparian area?
- Who is responsible if the retention/detention basins are insufficient?
- Why build in the easternmost wash?
- Where will the retention/detention basins go with such small lots?
- Washes are no longer horse accessible.
- Why can't the Town not allow development in the non-protected washes?
- Why protect the on-site slopes at the expense of the on-site washes?

<u>Traffic</u>

- How expansive will the Traffic Impact Analysis be?
- Did the applicant look into moving the access onto Lambert Lane?
- Access onto La Cholla will be problematic considering future road widening plans.
- How far will the proposed Lambert Lane access be from the existing park entrance on Lambert Lane?

<u>Neighborhood Compatibility</u>

- Has the applicant considered other vacant property within the Town?
- Has the applicant considered using a larger zoning district?
- How are the small lots compatible with the surrounding neighborhoods?
- Larger lot sizes should be required.
- Can the buffer yards just be natural open space? No roads/basins.

Building Height

- Can the applicant provide story poles on-site to represent proposed homes?
- Where will the 2-story homes be located? How many 2-story homes?

Utilities

- Will the utilities be underground?

Miscellaneous

- Why is the northeast component of the site not considered as part of this application?

Mr. Oland addressed some of the questions related to the proposed development and the associated impacts.

Mr. Laws, Town of Oro Valley Permitting Manager, addressed some of the questions related to drainage impacts of the proposed development and invited attendees to further discuss area drainage issues after the meeting.

Mr. Daines closed the meeting, thanked everyone for their attendance and encouraged everyone to contact Mr. Spaeth, the project manager, with any additional thoughts, comments or concerns.

Neighborhood Meeting Summary
Southeast Corner Lambert Lane and La Cholla Blvd.
Proposed Rezoning
February 12, 2015
6:00 – 7:30 PM
Casas Adobes Baptist Church, 10801 N La Cholla Boulevard.

5. **Introductions and Welcome**

Meeting Facilitator Chad Daines, Principal Planner, introduced the Oro Valley staff Michael Spaeth, Senior Planner, as project manager. Approximately 50 residents and interested parties attended the meeting.

6. **Staff Presentation**

Michael Spaeth, Senior Planner, provided a brief presentation that included:

- Overview of the 2nd neighborhood meeting
- Applicant's request
- Existing zoning of the property, including development standards
- Review tools
- Environmentally Sensitive Lands and Conservation Subdivision Design
- Review process
- Public participation opportunities

7. Applicant Presentation

Paul Oland from the planning firm WLB Group Inc., provided a brief presentation detailing the applicant's proposal, which included:

- Overview of project
- Revisions from 2nd neighborhood meeting
- Drainage impacts

8. Open House

Meeting facilitator, Chad Daines, introduce the Open House format and the goal of allowing residents to meet with Town Staff and the applicant one-on-one to ensure questions are fully answered. The open house consisted of four tables/stations including:

- Two engineering tables:
  - Regional Drainage
  - Drainage and Traffic related to the applicant's proposal
- Planning
- Applicant

The open house was well attended with each station fielding numerous questions. A number of regional drainage questions remained and staff committed to addressing those questions with the applicant and holding a fourth neighborhood meeting to provide updated information.

Mr. Daines closed the meeting, thanked everyone for their attendance and encouraged everyone to contact Mr. Spaeth, the project manager, with any additional thoughts, comments or concerns.

Neighborhood Meeting Summary
Southeast Corner Lambert Lane and La Cholla Blvd.
Proposed Rezoning
May 27, 2015
6:00 – 7:30 PM
Town of Oro Valley Council Chambers

1. Introductions and Welcome

Meeting Facilitator Chad Daines, Principal Planner, introduced the Oro Valley staff Michael Spaeth, Senior Planner, as project manager. Approximately 20 residents and interested parties attended the meeting, including Vice Mayor Water, Council Member Hornat and Council Memebr Zinkin, Planning and Zoning Commissioners Hurt and Barrett and Town Manager Greg Caton.

2. Staff Presentation

Michael Spaeth, Senior Planner, provided a brief presentation that included:

- Overview of the issues identified during the 3rd neighborhood meeting
- Purpose of the 4th neighborhood meeting
- Applicant's request
- Review process
- Public participation opportunities

3. Applicant Presentation

Paul Oland from the planning firm WLB Group Inc., provided a brief presentation detailing the applicant's proposal, which included:

- Overview of project
- Revisions from 3rd neighborhood meeting
- Drainage proposal

4. Question and Answer session

Meeting facilitator, Chad Daines, opened the floor to questions specific to the applicant's drainage concept and the anticipated impacts on regional drainage. The following questions or topics were discussed:

Drainage

- General suitability of the site for development
- Responsibility during flooding events
- How are upstream and downstream flows regulated
- Role of FEMA in approval process
- Timing of drainage infrastructure construction
- Culverts on Lambert Lane capacity
- Wash delineation. Different from FEMA.

Other topics

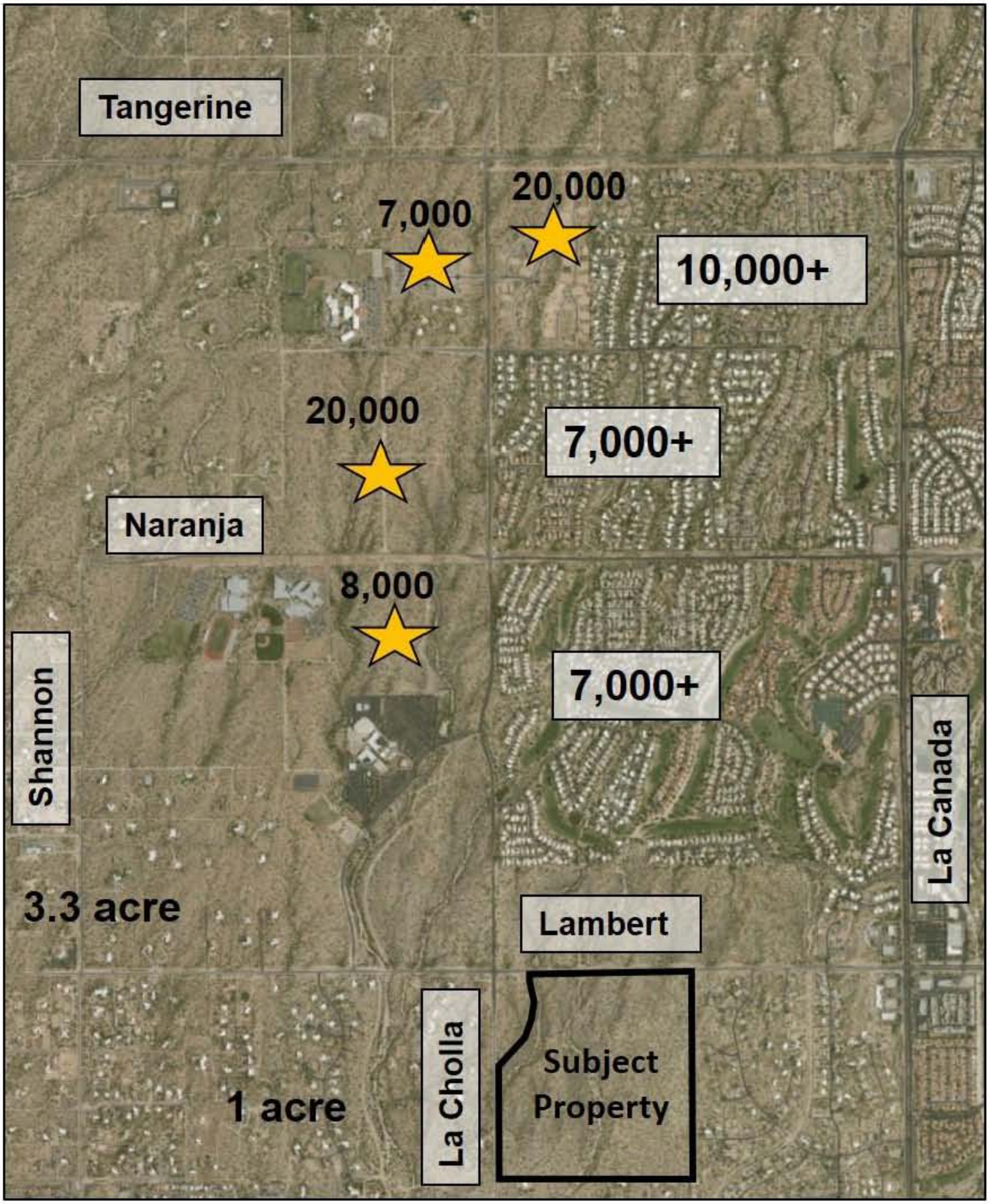
- Homes appear to be proposed in washes
- Compatibility with surrounding development
- Trail access

Mr. Daines closed the meeting, thanked everyone for their attendance and encouraged everyone to contact Mr. Spaeth, the project manager, with any additional thoughts, comments or concerns.

LA CHOLLA COMMONS CONCEPT PLAN

SOUTHEAST CORNER LAMBERT AND LA CHOLLA
(OV914-009)

Attachment 5



LA CHOLLA AREA LOT SIZES

SOUTHEAST CORNER LAMBERT AND LA CHOLLA
(OV914-009)

Attachment 6

The Property Preservation Partnership™

Managing Growth Sustainably, in Oro Valley

January 22, 2016

Mr. Michael Spaeth
Senior Planner
TOWN OF ORO VALLEY
1100 N. La Canada Dr.
Oro Valley, AZ 85737

RE: Lambert/La Cholla Tentative Site Plan 1/12/2016 & Re-Zoning Proposal (R1-44 to R1-43)

ORO VALLEY ZONING CODE CHAPTER 23-2A: DIMENSIONAL REQUIREMENTS (RESIDENTIAL)

APPLICANTS PROPOSED REQUIREMENTS AND NEIGHBORHOOD CONDITIONAL REQUIREMENTS to re-zone to R1-43 of Oro Valley Zoning Code

(A) CURRENT OV ZONING REQUIREMENTS	(B) WLB PROPOSED RE-ZONING REQUEST	(C)) RESIDENT CONDITIONS TO WLB PROPOSED RE-ZONING REQUEST	(D) WLB'S REQUEST FOR VARIANCE TO R1-43	(E) RESIDENT'S POSITION
R1-144	R1-43	R1-43 with conditions to Re-zoning	R1-43 with ESLO Incentives	
LOT SIZE: 144, 000 sq. ft.	43,560 sq. ft	• 18 LOTS @ 10,000 SQ. FT • 73 LOTS @ 21, 780 SQ. FT.	10,000 – 21, 780 sq. ft. PER TENTATIVE DEVELOPMENT PLAN	IN AGREEMENT
LOT WIDTH: 150 feet	150 feet	• 73 LOTS- 86FT x254FT(minimum) • 18 LOTS-80FT X125 FT(minimum)	80-86 feet	IN AGREEMENT
BUILDING HEIGHT: 18 feet	18 feet	20 feet = one story homes 28 feet= two story homes	20 feet = one story homes 28 feet = two story homes	IN AGREEMENT
SETBACK, SIDE YARD: 20 feet	20 feet	7.5 feet	7.5 feet	IN AGREEMENT
MINIMUM BETWEEN HOMES: 40 feet	40	15 feet	15 feet	IN AGREEMENT
Maximum Number of homes 43	141	91	91	IN AGREEMENT

The proposed changes to the current zoning of R1-144 to R1-43 with ESLO are acceptable to the surrounding neighborhoods with the above conditions for this rezoning.
The number of lots, dimensions and limits on lot sizes and configurations are considered "SIGNIFICANT" to the neighbors who surround this property.

THE SURROUNDING PROPERTY OWNERS REQUEST THAT ANY CHANGE IN THE DRAINAGE DESIGN AS DEPICTED ON THE 1/12/2016 TENTATIVE DEVELOPMENT PLAN BE CONSIDERED SIGNIFICANT AND THUS WILL ELIMINATE THE PRIVILIGE OF THE "MODIFIED PROCESS" FOR THIS REZONING.
We request that this letter be included as part of the forthcoming P & Z meeting and be entered into any formal record and /or documents provided to Council as part of the review process.

Sincerely,

Sean Frisby
smfrisby@hotmail.com
520-288-6910

Karen Stratman
kstratorovalley@gmail.com
520-906-8872

Cc: Mike Zinkin Bayer Vela

Spaeth, Michael

From: Greg <grspadinger@live.com>
Sent: Sunday, November 30, 2014 5:39 PM
To: Spaeth, Michael
Subject: OV114-018 - La Cholla and Lambert

Michael:

My wife, Toni, and I own three and a half acres on La Cholla 241' south of the proposed zoning change. Loma del Oro wash transverses the rear portion of our property. While I am certainly not against progress, and I assume that at some point the 155 acres will be developed, I am concerned about the handling of the increase in runoff. And, we know there will be an increase in runoff simply because there will be an increase in hardscape.

We have lived in the area since 2011. I have seen the effects of the runoff we currently are dealing with, and the damage it can cause.

Being lower than La Cholla, we receive a goodly amount of runoff from La Cholla, the streets of the west of side of La Cholla, and also a significant amount from the north. We know at some point La Cholla will be widened (I have a copy of the proposal from the county) which will include an access road beneath the level of La Cholla simply because the significant change in elevation from the west side of the road to the east. I have concerns that the plans call for sufficient drainage from the west to the east, as that runoff too is slated to enter Lomas del Oro, but to the south of my property. However, that's an issue for the county.

On July 4, 2012, we had a significant about of runoff to deal with. The neighbor immediately to the north has a culvert that runs under their driveway. I didn't know that until recently, but that is a rather significant wash that enters my parcel about 250' east of La Cholla. The 5th picture below reflects that runoff entering my property. The second and fourth pictures show a fence running parallel to the wash. That fence, and that large tree, disappeared that day. There is also a video attached which demonstrates the ferocity of the flow.

The issue with the work done on the wash is that the wash, when flowing, is far wider than the gabions that were put in to direct the water. There is a significant bank on the east side of the wash, but nothing on the west. As the video reflects, the water got behind the gabions and washed out a huge trough that had to be repaired. It has been repaired, but there has been nothing done to prevent a recurrence. Lomas del Oro was flowing probably slightly more than twice the space between the gabions. Any increase to the flow will only cause more damage. It should be noted that my neighbor to the south, ended up with 6" to 8" of silt in his driveway which had to be removed; by hand. I know, I helped. Silt is very heavy, by the way.

The next pictures reflect the rainfall total on August 12th. We have collection barrels. They

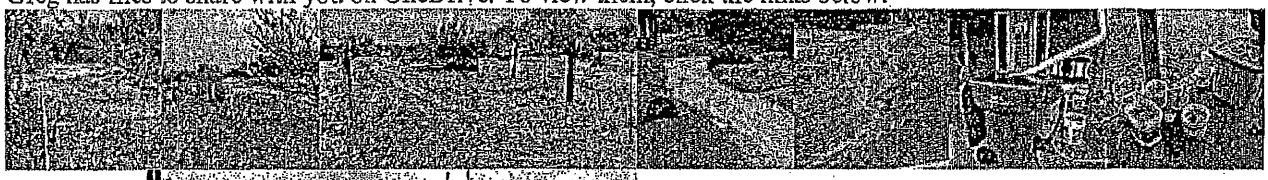
were full. So we filled our 96 gal. trash can also. We had just under an inch of rain that day - my point is it doesn't take a lot of rain to get a lot of runoff. Lastly are the pictures from the devastating rainfall from September 8th. Again, you can see the wash is flowing, and we also had a significant amount of damage to our driveway, and other areas of our property.

So, in closing, I am concerned about the volume of runoff that will be created an increase in the hardscape by the proposed subdivision. Any increase in volume to Lomas del Oro will be problematic. As you can see from the design of the current modifications to the wash, they were clearly inadequate. So, while I realize there will be catch basins incorporated into the proposal, what if they are insufficient? I am currently not in a flood plain. Unlike some of my downstream neighbors. However, the repairs to my driveway, maintenance of the washes that are on my parcel, are costly ventures. If the plans are insufficient, who's responsible? The builder? The Town? I spent a career in liability claims, and I have seen similar issues. Bad planning is never a good thing.

Thank you for your attention.

Greg Spadinger
Toni Dorsey

Greg has files to share with you on OneDrive. To view them, click the links below.



V4. LDR still flowing strong.MOV

Spaeth, Michael

From: Deanna Rex <rex9850@gmail.com>
Sent: Wednesday, February 11, 2015 2:46 PM
To: Spaeth, Michael
Subject: Rezoning SE corner LaCholla and Lambert

I am a resident that has serious concerns about the proposal of rezoning the above property and I would like to have my concerns heard and my questions answered.

Currently there are no 'cluster' developments in Oro Valley south of Lambert and west of LaCanada. Adding this kind of neighborhood will devalue the property of those of us living here currently. Even if we agree to the rezoning request, how can we stipulate that they cannot cluster the homes?

At the neighborhood meeting in December, concerns were expressed about the height of the new homes, so we were promised that poles would be planted reflecting those heights. When we arrived at the February meeting we find that the poles were placed but not at the finished height of the homes. The land will have to be built up before the homes are constructed to be pulled out of the flood plane so we still don't know what the finished height will look like. I was told it would be 3' - 4' higher. How much fill will they be allowed to put in to raise the land out of the flood plane? How can we be assured that it is not more than the 3' - 4' feet?

Where are the catch basins going to be located? I have concerns that if they are placed strictly on the south edge of the land that this is going to have a devastating effect on the amount of water that will be funneled down the wash. There is already a flooding problem in this area. And surely they wouldn't be allowed to place the catch basins in the 150' setback zone, correct?

I want to also want to put it on record that I am very concerned about how any alterations to that land will directly affect downstream properties, mine included. I think we need to have a hydrologist specialist review this plan to determine what the ultimate effect will be.

There are many flaws with the design of this project and I, for one, object to the current proposal.

February 12, 2015

Michael Spaeth and Planning Staff
Town of Oro Valley

RE: OV114-018
Lambert and La Cholla Southeast Corner Rezoning

Dear Mr. Spaeth and Planning Staff,

The proposed rezoning request for the SE corner of Lambert Lane and La Cholla Blvd. impacts neighborhoods on three sides of the proposed plan. Issues regarding the proposed rezoning and future development of this site with respect to the adjacent property owners and existing homes have been brought up in the neighborhood meetings with the Town Staff and Applicant. The list of items that may impact the value of these existing homes and properties, are, but not limited to, the following:

- Lot size, zoning conformance, setbacks between buildings, drainage and traffic concerns.

Please consider the following for this rezoning request in order to protect the quality, value and character of the surrounding neighborhoods and properties as specified in Section 1.4.7 of the General Plan.

1. Proposed lot size is approximately 6,000 sq. ft. equivalent to 1.2 units per acre. The General Plan has a range of 0.4 to 1.2 units per acre allowed. We believe allowing closer to 0.4 units per acre will be more compatible with the surrounding neighborhood. Section 2.1.9 of the General Plan states that new developments need to consider 400' landscape buffers. WLB is proposing 150'.

2. No height variance under R1-43 should be granted. This Code does not allow 2 story homes. This area is specified as a "Scenic Corridor" under Section 11.3.1 of the General Plan. Town needs to protect views in this Scenic Corridor.

3. No setback variance should be granted. Minimum setbacks between homes should be no less than 10 feet. WLB is proposing 5'.

4. Drainage must be addressed. We have incomplete information. Are there properties south of this project have wells? Approximately 25-30 homes are conceptually located in FEMA - Zone A Flood Plain (noted as Wash C on WLB Site Analysis). Note that Section 2.1.2 in the General Plan "prohibits designs that channelize water courses". Section 12.1.1 of the General Plan says with regard to the Floodways-100 Year Flood, that the "Town shall require that natural washes be kept from development". Section 12.1.6 of the General Plan says that the "Town shall continue to enforce storm water controls to prevent the erosion or siltation of washes".

5. Assure that the access points will reduce traffic conflicts with future development from multiple access points as will be required on the north side of Lambert Lane. Assure that there will be adequate Traffic Studies done for egress and ingress.

The General Plan and the State "Growing/ Plus Statutes" have guidelines that the proposal has not adhered to. The Town of Oro Valley should not let developers selectively interpret it.

Respectfully, Lois Roth

Oro Valley Resident

February 12, 2015

Michael Spaeth and Planning Staff
Town of Oro Valley

RE: OV114-018
Lambert and La Cholla Southeast Corner Rezoning

Dear Mr. Spaeth and Planning Staff,

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- Lot size, zoning conformance, setbacks between buildings, drainage and traffic concerns.

Please consider the following for this rezoning request in order to protect the quality, value and character of the surrounding neighborhoods and properties as specified in Section 1.4.7 of the General Plan.

1. Proposed lot size is approximately 6,000 sq. ft. equivalent to 1.2 units per acre. The General Plan has a range of 0.4 to 1.2 units per acre allowed. We believe allowing closer to 0.4 units per acre will be more compatible with the surrounding neighborhood. Section 2.1.9 of the General Plan states that new developments need to consider 400' landscape buffers. WLB is proposing 150'.

2. No height variance under R1-43 should be granted. This Code does not allow 2 story homes. This area is specified as a "Scenic Corridor" under Section 11.3.1 of the General Plan. Town needs to protect views in this Scenic Corridor.

3. No setback variance should be granted. Minimum setbacks between homes should be no less than 10 feet. WLB is proposing 5'.

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5. Assure that the access points will reduce traffic conflicts with future development from multiple access points as will be required on the north side of Lambert Lane. Assure that there will be adequate Traffic Studies done for egress and ingress.

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The Town of Oro Valley should not let developers selectively interpret it.

Respectfully,

Oro Valley Resident Steven Roth

February 12, 2015

Michael Spaeth and Planning Staff
Town of Oro Valley

RE: OV114-018
Lambert and La Cholla Southeast Corner Rezoning

Dear Mr. Spaeth and Planning Staff,

The proposed rezoning request for the SE corner of Lambert Lane and La Cholla Blvd. impacts neighborhoods on three sides of the proposed plan. Issues regarding the proposed rezoning and future development of this site with respect to the adjacent property owners and existing homes have been brought up in the neighborhood meetings with the Town Staff and Applicant. The list of items that may impact the value of these existing homes and properties, are, but not limited to, the following:

- Lot size, zoning conformance, setbacks between buildings, drainage and traffic concerns.

Please consider the following for this rezoning request in order to protect the quality, value and character of the surrounding neighborhoods and properties as specified in Section 1.4.7 of the General Plan.

1. Proposed lot size is approximately 6,000 sq. ft. equivalent to 1.2 units per acre. The General Plan has a range of 0.4 to 1.2 units per acre allowed. We believe allowing closer to 0.4 units per acre will be more compatible with the surrounding neighborhood. Section 2.1.9 of the General Plan states that new developments need to consider 400' landscape buffers. WLB is proposing 150'.

2. No height variance under RI-43 should be granted. This Code does not allow 2 story homes. This area is specified as a "Scenic Corridor" under Section 11.3.1 of the General Plan. Town needs to protect views in this Scenic Corridor.

3. No setback variance should be granted. Minimum setbacks between homes should be no less than 10 feet. WLB is proposing 5'.

4. Drainage must be addressed. We have incomplete information. Are there properties south of this project have wells? Approximately 25-30 homes are conceptually located in FEMA - Zone A Flood Plain (noted as Wash C on WLB Site Analysis). Note that Section 2.1.2 in the General Plan "prohibits designs that channelize water courses". Section 12.1.1 of the General Plan says with regard to the Floodways-100 Year Flood, that the "Town shall require that natural washes be kept from development". Section 12.1.6 of the General Plan says that the "Town shall continue to enforce storm water controls to prevent the erosion or siltation of washes".

5. Assure that the access points will reduce traffic conflicts with future development from multiple access points as will be required on the north side of Lambert Lane. Assure that there will be adequate Traffic Studies done for egress and ingress.

~~The General Plan and the State "Growing Plus Statutes" have guidelines that the proposal has not adhered to.~~
The Town of Oro Valley should not let developers selectively interpret it.

Respectfully,

Oro Valley Resident

Liz Rullo
10300 N. Rancho Sonora
OV 85737

February 12, 2015

Michael Spaeth and Planning Staff
Town of Oro Valley

RE: OV114-018
Lambert and La Cholla Southeast Corner Rezoning

Dear Mr. Spaeth and Planning Staff,

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Please consider the following for this rezoning request in order to protect the quality, value and character of the surrounding neighborhoods and properties as specified in Section 1.4.7 of the General Plan.

1. Proposed lot size is approximately 6,000 sq. ft. equivalent to 1.2 units per acre. The General Plan has a range of 0.4 to 1.2 units per acre allowed. We believe allowing closer to 0.4 units per acre will be more compatible with the surrounding neighborhood. Section 2.1.9 of the General Plan states that new developments need to consider 400' landscape buffers. WLB is proposing 150'.

2. No height variance under R1-43 should be granted. This Code does not allow 2 story homes. This area is specified as a "Scenic Corridor" under Section 11.3.1 of the General Plan. Town needs to protect views in this Scenic Corridor.

3. No setback variance should be granted. Minimum setbacks between homes should be no less than 10 feet. WLB is proposing 5'.

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5. Assure that the access points will reduce traffic conflicts with future development from multiple access points as will be required on the north side of Lambert Lane. Assure that there will be adequate Traffic Studies done for egress and ingress.

~~The General Plan and the State "Growing/Plus Statutes" have guidelines that the proposal has not adhered to.~~
The Town of Oro Valley should not let developers selectively interpret it.

Respectfully, Karen Johnson

Oro Valley Resident
1707 W. Placita Cardal

February 12, 2015

Michael Spaeth and Planning Staff
Town of Oro Valley

RE: OV114-018
Lambert and La Cholla Southeast Corner Rezoning

Dear Mr. Spaeth and Planning Staff,

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Please consider the following for this rezoning request in order to protect the quality, value and character of the surrounding neighborhoods and properties as specified in Section 1.4.7 of the General Plan.

1. Proposed lot size is approximately 6,000 sq. ft. equivalent to 1.2 units per acre. The General Plan has a range of 0.4 to 1.2 units per acre allowed. We believe allowing closer to 0.4 units per acre will be more compatible with the surrounding neighborhood. Section 2.1.9 of the General Plan states that new developments need to consider 400' landscape buffers. WLB is proposing 150'.

2. No height variance under R1-43 should be granted. This Code does not allow 2 story homes. This area is specified as a "Scenic Corridor" under Section 11.3.1 of the General Plan. Town needs to protect views in this Scenic Corridor.

3. No setback variance should be granted. Minimum setbacks between homes should be no less than 10 feet. WLB is proposing 5'.

4. Drainage must be addressed. We have incomplete information. Are there properties south of this project have wells? Approximately 25-30 homes are conceptually located in FEMA - Zone A Flood Plain (noted as Wash C on WLB Site Analysis). Note that Section 2.1.2 in the General Plan "prohibits designs that channelize water courses". Section 12.1.1 of the General Plan says with regard to the Floodways-100 Year Flood, that the "Town shall require that natural washes be kept from development". Section 12.1.6 of the General Plan says that the "Town shall continue to enforce storm water controls to prevent the erosion or siltation of washes".

5. Assure that the access points will reduce traffic conflicts with future development from multiple access points as will be required on the north side of Lambert Lane. Assure that there will be adequate Traffic Studies done for egress and ingress.

~~The General Plan and the State "Growing/ Plus Statutes" have guidelines that the proposal has not adhered to.~~
The Town of Oro Valley should not let developers selectively interpret it.

Respectfully,

Oro Valley Resident

Vicki + Kevin Gontyes
1720 W Mastico Canada

February 12, 2015

Michael Spaeth and Planning Staff
Town of Oro Valley

RE: OV114-018
Lambert and La Cholla Southeast Corner Rezoning

Dear Mr. Spaeth and Planning Staff,

The proposed rezoning request for the SE corner of Lambert Lane and La Cholla Blvd. impacts neighborhoods on three sides of the proposed plan. Issues regarding the proposed rezoning and future development of this site with respect to the adjacent property owners and existing homes have been brought up in the neighborhood meetings with the Town Staff and Applicant. The list of items that may impact the value of these existing homes and properties, are, but not limited to, the following:

- Lot size, zoning conformance, setbacks between buildings, drainage and traffic concerns.

Please consider the following for this rezoning request in order to protect the quality, value and character of the surrounding neighborhoods and properties as specified in Section 1.4.7 of the General Plan.

1. Proposed lot size is approximately 6,000 sq. ft. equivalent to 1.2 units per acre. The General Plan has a range of 0.4 to 1.2 units per acre allowed. We believe allowing closer to 0.4 units per acre will be more compatible with the surrounding neighborhood. Section 2.1.9 of the General Plan states that new developments need to consider 400' landscape buffers. WLB is proposing 150'.

2. No height variance under R1-43 should be granted. This Code does not allow 2 story homes. This area is specified as a "Scenic Corridor" under Section 11.3.1 of the General Plan. Town needs to protect views in this Scenic Corridor.

3. No setback variance should be granted. Minimum setbacks between homes should be no less than 10 feet. WLB is proposing 5'.

4. Drainage must be addressed. We have incomplete information. Are there properties south of this project have wells? Approximately 25-30 homes are conceptually located in FEMA - Zone A Flood Plain (noted as Wash C on WLB Site Analysis). Note that Section 2.1.2 in the General Plan "prohibits designs that channelize water courses". Section 12.1.1 of the General Plan says with regard to the Floodways-100 Year Flood, that the "Town shall require that natural washes be kept from development". Section 12.1.6 of the General Plan says that the "Town shall continue to enforce storm water controls to prevent the erosion or siltation of washes".

5. Assure that the access points will reduce traffic conflicts with future development from multiple access points as will be required on the north side of Lambert Lane. Assure that there will be adequate Traffic Studies done for egress and ingress.

~~The General Plan and the State "Growing Plus Statutes" have guidelines that the proposal has not adhered to.~~
The Town of Oro Valley should not let developers selectively interpret it.

Respectfully,

Oro Valley Resident Richard A. Hicks 1710 W. PLACITA CARACOL

Chuck & Wendy Sweet
10332 N. Placita Lujoso
Oro Valley, Arizona 85737

January 19th 2016

Oro Valley Planning & Zoning Commission
Oro Valley, Arizona

Re: Proposed rezoning of an approximately 143-acre property from R1-144 to R1-43 to develop a single-family detached residential subdivision, located on the southeast corner of La Cholla Boulevard and Lambert Lane, OV914-009

Dear Planning and Zoning Commission Members:

Thank you for the opportunity to provide comments regarding the above referenced rezoning of the property located on the southeast corner of La Cholla Boulevard and Lambert Lane, OV914-009.

We are encouraged by the applicant's reduction in density from 153 lots to 91 lots and the protection of significant open space for the project. We would be supportive of this rezoning with conditions.

The conditions that we would ask you to add to this rezoning have to do with safety improvements both on Lambert Lane and La Cholla Boulevard. Since we have lived in the Rancho Feliz subdivision directly east of the subject property for the past 23 years, we travel both Lambert Lane and La Cholla Boulevard on a daily basis. Even though the Town's upcoming road improvement project on Lambert Lane this summer will help some with traffic congestion, if this residential project moves forward in the coming years safety improvements are critical for those future residents and the existing traveling public.

We request that the following condition be added to the rezoning of the property located on the southeast corner of La Cholla Boulevard and Lambert Lane, OV914-009:

"Future Tentative/Final Plat and Development Plans for rezoning OV914-009 shall include the design and ultimate construction by the landowner/applicant of left turn bays and deceleration lanes on both Lambert Lane and La Cholla Boulevard at the entrance roads for the subject property."

If the P&Z Commission recommends and the Town Council ultimately approves this rezoning as per the latest revision, the land owners and future home builder will receive a significant increase in property value overnight. The inclusion of the above requested condition as a part of rezoning is only right and fair for existing residents and those who would be buying these homes.

Thank you for your consideration of this request.

Sincerely,

Chuck & Wendy Sweet

Chuck & Wendy Sweet

C: Michael Spaeth, AICP Senior Planner, TOV

MAR 14'16AM 9:16 TOV

March 7, 2016

Town of Oro Valley
11000 N. La Canada Drive
Oro Valley, Arizona 85737

Attn: Ms. Julie Bower, Town Clerk
Re: 1/12/2016WLB Flow Mitigation Graphic

Dear Ms. Bower:

At a meeting of residents regarding the property in question, Councilmember Zinkin was present.

At his suggestion I am respectfully requesting that this letter be placed in the "Fasseas Packet", for the March 16, 2016 council agenda.

Thank you for your courtesy,

Ray Bauer

RAY BAUER
9900 North La Cholla Boulevard
Oro Valley, Arizona 85742-9645
email: raybauerir141@live.com

Mike Zinkin
Councilmember
Mayor and Town Council

Phone: (520) 229-4993
Mobile: (520) 471-0321
Fax: (520) 297-0428
E-mail: mzinkin@orovalleyaz.gov

Town of Oro Valley
11000 N. La Cañada Drive
Oro Valley, Arizona 85737
www.orovalleyaz.gov

Town of Oro Valley
11000 N. La Canada Drive
Oro Valley, AZ 85737
Re: 1/12/2016 11"x17", WLB Flow Mitigation Graphic

February 29, 2016

Honorable Mayor and Town Councilmembers:

At a meeting of residents regarding the property in question, **Councilmember Zinkin was present**. At his suggestion, the Town Clerk was requested to include this letter in the Fasseas packet, for the March 16, 2016 council agenda. Mr. Zinkin also viewed a video illustrating the ferocity of an LDO Wash flow that *almost totally filled the **only** exit culvert*.

After discussing the sketch I had been advised to contact the Town Engineer, as a courtesy and also as a record of fact at this juncture. I did so in a similar letter on February 4, 2016, on March 3, 2016, Engineer M. Todnem, P.E., responded.

When a legal action may be imminent, a letter of intent or claim precedes. I have no present plans for any such option, at this time. Nor should this communication be construed as part of such a document. However, negligence is a valid basis for such an action. I believe it shall be evident that, that element is present as indicated, herein.

The present Town Engineer, had none of the faults concerned initiated on his watch. However, as Town Engineer he, as well as the Mayor and Town Council, have been entrusted with a solemn duty and I believe you will find that one must choose to defend the neglect pointed out or be part of the solution and revisions. I believe you will opt for solutions.

Regardless of water mitigation efforts, this and future development, along with the new La Cholla road drainage, will all have **some** impact upon **the only exit, The LDO Wash**. The WLB graphic perfectly illustrates the problem. Rains that may be normally absorbed will now be deflected by development flat surfaces into the narrow, barely visible, gabion lined LDO Channel, lower left, resulting in increasing volumes and velocities.

LDO Wash flows are imagined to be associated only with local rains. Large flows occur for hours at night, with no local rains. The sources are the mountain flows which may occur at any time. With the drought, multiple flows are reduced.

At the initial meeting of the 2009 "LDO Wash Improvement Project", on April 8, 2009, an Oro Valley/Consultant handout stated it would, "Provide the additional capacity required to convey the 100-year flow event, *"with sufficient freeboard"*. However, the required FEMA printed notice of 7/29/2009 in the Explorer News, approved only a design that would, "convey CLOSE to the 100 year storm event". Most residents were unaware and uninformed of the change.

That meeting was hosted by an OV Stormwater Engineer and Town consultant. After viewing the plans, my wife and I proposed to donate additional lands, at no cost to the Town, to widen **the proposed 25' wash. It had been 32' wide**. We believed then, as now, that the consultant plan was, and is, flawed. **Width and bank heights were, and are insufficient** to handle even present, as well as future increasing flows. Our offer was bluntly refused without any consideration.

Our *existing 60" high walls of 6" reinforced gunite*, *with a 1'x 4' reinforced toe, were allegedly deemed too low* by the Town consultant. Our **existing 60" walls** were destroyed and replaced with gabions presently **as low as, 49 inches to 55 inches above the existing flow levels. Minimum plan specifications are 61 inches.**

An OV Stormwater Engineer wrote in regard to a flow on 7/12/2012, that the *"structure had functioned superbly"*. Apparently unknown to him, **243 feet of the gabions**, on our property, had **been washed out** 3' wide and 4' deep. Haphazard repairs were made, and not to original specification, as required. It leans embarrassingly, yet today.

Our lands adjacent to all the gabion walls here are higher, except for the washed out section, because all the walls are of *insufficient height for protection* from ever increasing flows. *This also has caused us tremendous erosion* !

In an email of **3/17/2011**, to the project manager, I protested the low heights of all the walls across our property considering it mandatory **for an addition of at least an 18 inch row of gabions** to increase the bank protection and to be at grade with adjacent land. I was advised that *one could not just add a row of 18" baskets **on the top**, as it would not be stable. If it were added, **it must be underneath** the gabion stack, and it was **now impossible*** to do so on our property.

Roads and development drainage, no matter how mitigated, will have an effect upon the LDO Wash. The weakest link is **here**, *where flows enter and are sharply restricted by the narrow, steep* channel. **They produce frighteningly violent wave actions and unbelievably swift velocities**. The video viewed by Councilmember Zinkin should be required viewing.

Here, at that entering point will be found the **lowest**, **poorest** bank protections. **Here**, *243 feet of gabions were washed out as well as being overtopped in other locations*. **Here**, *bank heights may be seen as low as* **49 inches**. **Minimum** specs are **61** inches. **Here**, an increased 18" bank height was refused because it was not possible **to add the gabions on top**.
And **here**, for over 47 years, my wife and I have resided on this 4.89 acres and monitored this channel.

However, 20 feet downstream of our 57 inch wall, the walls have risen 91 to 102 inches – *with* **18 inch gabions on top.** Although *we were advised* this height and procedure *was not possible,* it apparently *was* possible. **But, just not for us.**

The bank improvements were appreciated, but, finding that a **double standard had been perpetrated against us** that renders our property ***more vulnerable***, than an adjacent property by this **negligence**, is a travesty that must be addressed. To permit new development and new roads to add to the LDO Wash flows **without first addressing and correcting this negligence** that has imperiled our safety by this **double standard**, is unthinkable.

The addition of the originally requested 3' x 1.5' (18") row of filled, secured and backfilled gabion baskets must be installed on top of the entire section of LDO Wash bank protections that pass through the 9900 N. La Cholla property. The need was clearly demonstrated by the *243 foot* wall washout *here*, and overtopping of gabions *here*, previously.

It would also be quite helpful if the *most simple* requirement of the **recorded easement**, granted to the Town, was also implemented. And that is: "*Scheduled elimination of weeds*". The small channel aside our north drive is most indicative of this *impediment to flows* into the wash, it is overflowing with weeds and has never been addressed as required.

As suggested, there *are* choices for us all. I pray the correct one will be made for our Town, as it is *our* Town as well.

Thank you for your attention.

Sincerely,

Ray Bauer

RAY BAUER, Trustee, The Bauer Family Revocable Trust
9900 N. La Cholla Blvd.,
Oro Valley, AZ 85742-9645
email: raybauerir141@live.com

March 8, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, Paul Jeschor, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: Paul Jeschor

Address: 9949 N. Camino Paramo Oro Valley AZ 85737

Date: March 8th, 2015

March 6, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>
Paul Keesler (Via Town of Oro Valley web site contact form)

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

We, ___Dennis and Jodi Swena_____, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: ___Dennis and Jodi Swena_____

Address: _1930 W. Camino Bajio_____

Date: ____03/07/2015_____

March 6, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, ___Will Brooks_____, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name:_Will Brooks_____

Address: _10021 N Placita Cascabella_____

Date: _March 6, 2015_____

March 6, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, ___James Nason____, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: James Nason_____

Address: 10020 N Placita Cascabella, Oro Valley, AZ 85737

Date: ___3/6/2015_____

March 10, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, Bonnie Quinn, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: Bonnie Quinn

Address: 9950 N. Camino Paramo

Date: 3-10-15

March 12, 2015

I, Margaret R. Shafer, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

I am Margaret Rosaria Shafer and I reside at 9999 Camino Paramo in Oro Valley. I respectfully submit this formal protest on March 12, 2015. I can be reached via this email address, by US mail at the address above or by phone at 520.401.2669.

Cordially,
Margaret Shafer

MAR 9 2015

March 6, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, Carol Hunter, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely, Carol Hunter

Name: Carol Hunter

Address: 10000 N. Placita Cascabel

Date: 3/9/15

March 6, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, Sally M Bates, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: SALLY M BATES

Address: 9950 N PASEO CORONA, 85737

Date: 3-6-2015

March 6, 2015

Town of Oro Valley

Michael Spaeth <mspaeth@orovalleyaz.gov>
Bayer Vella <bvella@orovalleyaz.gov>

RE: RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, Richard A. Hicks, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: RICHARD A. HICKS

Address: 1710 W. PLACITA CARACOL

Date: 3/13/15

June 8, 2015

Town of Oro Valley

Michael Spaeth

Bayer Vella

RE: OV114-018
Lambert Lane and La Cholla Boulevard Southeast Corner Rezoning

I, Steven M. Roth, protest the rezoning of the SE corner of Lambert Lane and La Cholla Boulevard. I am an adjoining property owner and I am filing a formal protest of the rezoning of this property.

Sincerely,

Name: Steven M. Roth

Address: 1720 W. Placita Saltan

Date: 6/8/15

Attachment 11
Southeast corner of Lambert Lane and La Cholla Boulevard rezoning
Planning and Zoning Commission Meeting Minutes
Town Council
May 4, 2016

2. PUBLIC HEARING: DISCUSSION AND POSSIBLE ACTION ON A PROPOSED REZONING OF AN APPROXIMATELY 142-ACRE PROPERTY FROM R1-144 TO R1-43 TO DEVELOP A 91-LOT RESIDENTIAL SUBDIVISION AND USE OF THE MINIMUM LOT SIZE, BUILDING HEIGHT AND MODIFIED REVIEW PROCESS FLEXIBLE DESIGN OPTIONS. THE PROPERTY IS LOCATED ON THE SOUTHEAST CORNER OF LAMBERT LANE AND LA CHOLLA BOULEVARD, OV914-009

Michael Spaeth, Senior Planner, provided a presentation that included the following:

- Purpose
- Location Map
- Site Map
- Review Criteria
- General Plan, Land Use Compatibility
- General Plan, Road Widening
- General Plan and Zoning, Environment
- Conservation Subdivision Design
- Flexible Design Options
- Public Participation
- Summary and Recommendation

Commissioner Hurt recommended that all general notes shown in exhibit R be cleaned up.

Commissioner Hurt asked if there has been any contact with Pima County and or Federal Emergency Management Association (FEMA) regarding the flooding issues.

David Laws, Planning Manager, responded that back in 2011 the Town completed improvements to the Lamas del Oro wash immediately south of this project. As a result the Town also proposed a LOMAR (letter of map revisions) process. Many properties were affected by the FEMA flood plain. As a result of that, property owners with a secured loan for a home were required to get flood insurance.

Back in 2015, the Town did get the LOMAR process approved through FEMA and the result was the removal of a significant portion of those properties from FEMA flood plain. Moving forward with this project, should it be successful for the rezoning, the developer of the project will be required to go through a similar process for their own property if it includes work in the flood plain.

As currently proposed, work is being done close to those areas. Property owners would be required to go through the LOMAR process to get those maps revised. Otherwise they are going

to have issues with securing insurance. The portion between this property and where the Town ended improvement is the questionable part.

Commissioner Hurt questioned whether the drainage analysis done by G. E. Fuller includes all washes? His concern is the drainage analysis appears to only involve one wash.

David Laws, responded that an analysis was done for the three areas and focus was the main wash. As we move forward through the development process, should this be a successful rezoning, a very detailed analysis will need to be completed on each of the washes, including encroachments into those areas with proposed improvements.

Commissioner Hurt commented that the property just north of Lambert Lane is undeveloped at this point. Two of the washes that go through the subject property also go through the undeveloped area. When that undeveloped property north of Lambert is developed, it will have an impact on those washes as well as downstream. His concern is the downstream issue and the property to the north.

David Laws, responded as the property to the north is developed, the developer will be required to analyze the impact of drainage standalone. It is the downstream areas that is actually making them go beyond what would typically be required. For the property to the north they will have to do an analysis of existing conditions and evaluate upstream and downstream conditions and incorporate a design that basically offsets the excess stormwater that is created from parking lots or rooftops, sidewalks to make sure that this is captured and held in place and slowly released to basically mimic existing conditions. Ultimately the drainage criteria requires that there is no downstream impact. So what you see today is what you're going to see a month later or a year later once that development is constructed. So there should be no impact.

Paul Oland, WLB Group, representing the applicant, provided a presentation that included the following:

- Updated Plan Changes
- Where we are at now
- Downstream impacts
- Summary

Commissioner Barrett questioned the applicant on the portion of the property that is undevelopable.

Mr. Oland responded, the Environmentally Sensitive Land Ordinance (ESLO) is meant to protect the most sensitive areas of the property. It allows a way to pursue cluster development which is encouraged by Town code so you can achieve densities planned by the General Plan without disturbing or going into the sensitive areas.

Vice-Chair Leedy opened the public hearing.

Dennis Swena, Oro Valley resident, stated he owns the property south of the proposed project. He has seen erosion of the embankment below his home. During the planning phase of the FEMA/Lomas del Oro Wash Flood Control Project he was approached by a Town employee by the name of Dave Parker and asked to sign a waiver allowing construction equipment on his property. At that time Mr. Swena pointed out the erosion of the embankment and raised concerns about it. The engineer agreed that his worries were alignment and proposed a remedy which was drawn into the plans. The waiver was signed, fully expecting that the Town would perform on it commitment. As it turns out the erosion protection promise for the embankment was pulled out of the plans without notification and was never constructed. Further substantial erosion was suffered from the flood of 2012, his property is bisected in half by the Loma del Oro Wash. The engineering changes eluded to the general outlines of this project will have a real impact on increasing the flow rate across his embankment that has been mentioned by Mr. Spaeth and the developer. Currently most of the runoff from the ridge north of his property becomes channeled and drains into the wash downstream from the embankment. Together with this vague and underlying changes to the Lamas del Oro Wash upstream from his property is cause for great concern. This proposed development together with other developments upstream is having a very real and substantial impact on property owners like himself. The plan before the Commission shows dotted lines along the wash as it traverses his property, but what do those lines even mean and how exactly will they be designed and constructed? How will it allow access to the north half of his property and impact the value and usefulness of his property. The developer has made some vague commitments in this regard but refuses to provide the detailed information in order for Mr. Swena to make an informed decision. This developer has promised substantial construction on his property but has not been willing to provide the detailed information that he needs in a form he can have reviewed by a professional and hold them accountable for their commitment. It would be irresponsible for him to agree to these terms, as well as irresponsible of this Commission to recommend approval of this project with so many questions left unanswered.

Karen Stratman, Oro Valley resident, stated where the neighbors left off is not where Mr. Oland left off. This property including the corner lot which has been excluded from this rezoning is currently R1-144, which means that they are 3 plus acre lots. It remains to define as low density residential in the current and newly revised version of the General Plan. The subject property has been discussed extensively in regards to the washes. Eventually this land will be developed and we are willing to work with Mr. Oland and Town staff to make this project. The neighbors have met and believe there is compatibility with the surrounding property owners, however the drainage is still not agreed upon by many property owners and is a pretty big problem. As stated earlier by the Town, we have put a lot of effort into extensive concessions and meetings by both sides and we believe there is some win, win between the neighbors and the Town and developer. There was disagreement about the two-story homes and what she was told was those rows of homes that have no red dots would have two two-story homes maximum in a row. Ms. Stratman would like to recommend this proposed project be approved with stipulations that the modified review process be denied and the conditions asked for by the neighbors for the special use policies for the conditions be added as well as including property owners to the south in any drainage design.

Liz Rulto, Oro Valley resident, stated she lives east of the proposed project and has been involved in this process with Mr. Oland for over a year. This has been the most confusing process that she has ever been involved in. Her main concern is the water drainage from the north, a lot of the culvert systems that are in place have been breached because of the intensity in which the water is moving from the north down the washes to this property. The developer stated he can help people out of the floodplain is a false statement. There is a huge process with FEMA. The modified review process was never discussed in the last year of community meetings. Ms. Rulto recommends that staff does not allow the modified review process.

Deanna Rex, Oro Valley resident, stated there was never a meeting after the new development was designed. The last meeting was hosted by a retired WLB hydrologist who stated the plan in place would not work. Placing the drainage downstream would take her out of the floodplain. The promise now is to place these retaining basins in that a retired hydrologist stated would not work. This new plan was mailed to us but never was discussed as a group.

Jonathon Kearns, Oro Valley resident, stated he lives on the west side of La Cholla where the other entrance will be located. This entrance is a very dangerous place to pull out. Should the Regional Transit Authority (RTA) not do what they need to do prior to this development, it will become increasingly more dangerous.

Vice-Chair Leedy closed the public hearing.

MOTION: A motion was made by Commissioner Swope and seconded by Commissioner Gribb to Table the item tonight in lieu of additional drainage analysis and maybe one more public meeting with the neighborhood.

7:39 Councilmember Joe Hornat showed up

MOTION failed, 2-4 with Commissioner Barrett, Commissioner Hitt, Commissioner Hurt, and Vice-Chair Leedy opposed.

MOTION: A motion was made by Commissioner Hitt and seconded by Vice-Chair Leedy to Recomend Approval of the proposed rezoning from R1-144 to R1-43 and use of the requested Flexible Design Options including minimum lot size, building height ~~and modified review process~~ based on the findings in the staff report, subject to the conditions in Attachment 1.

Commissioner Swope offered a friendly amendment that the modified review process not be included in the recommended approval.

Commissioner Hitt and Vice-Chair Leedy accepted the friendly amendment.

Commissioner Barrett offered a friendly amendment which states that the lots be confined to their developable area and still meet the 10,000 square foot minimum lot requirement.

Commissioner Hitt and Vice-Chair Leedy did not accept the friendly amendment.

MOTION carried, 6-0.

Town Council Regular Session **Item # 3.**

Meeting Date: 05/04/2016

Submitted By: Rosevelt Arellano
Development Infrastructure Services

Department: Development Infrastructure Services

Information

SUBJECT:

PUBLIC HEARING: ORDINANCE NO. (O)16-06, AMENDING SECTION 22.9 OF THE ORO VALLEY ZONING CODE REVISED RELATED TO MINOR FINAL PLAT AMENDMENTS

RECOMMENDATION:

The Planning and Zoning Commission has recommended approval of the request as provided in Attachment 1.

EXECUTIVE SUMMARY:

The purpose of this request is to establish a review process and requirements for Minor Final Plat Amendment applications. A minor amendment is a request to modify an approved subdivision plat, which does not change the key components of an approved subdivision design (e.g., open space, lot number and pattern, street configuration, main subdivision access, conditions of approval, etc.).

All amendments to Final Plats follow the same approval process as a new Final Plat. As a result, Town Council reviews and acts on all Final Plat Amendments including road names, technical corrections and boundary adjustments, which are all technical items that are consistently placed on the Town Council consent agenda for approval.

The request (Attachment 1) would identify what minor amendments could be administratively approved by the planning and zoning administrator and what significant amendments require Town Council approval. This request is consistent with the best practices commonly found in other Arizona communities (Attachment 2).

The request was considered and recommended for approval by the Planning and Zoning Commission on March 1, 2016.

BACKGROUND OR DETAILED INFORMATION:

Final Plat Amendments currently follow the same approval process as a new Final Plat through Town Council action. The ability to administratively approve a Minor Final Plat Amendment is a common practice found in most Arizona communities. For this reason, a code amendment was included as a top priority on the 2015 Planning Division Work Plan to address this issue (Attachment 3).

Definition of a Minor Final Plat Amendment

The request (Attachment 1) would enable the planning and zoning administrator the ability to administratively approve limited amendments to a Final Plat as follows:

1. Scrivener's errors, which are unintentional clerical mistakes made during the drafting, publishing or copying process. Scrivener's errors include corrected courses, distances, monumentations, property information, updated street names, and similar technical items
2. Adjustments to utility easements and building pads
3. Property line modifications with concurrence from all affected parties
4. Adjustments to floodplain and erosion hazard boundaries approved by the town engineer
5. Driveway relocations approved by the town engineer

The proposed amendment will allow minor, common sense changes to be administratively approved by the planning and zoning administrator. These administrative changes will result in a more efficient process to correct technical errors and other non-material changes in a manner which is commonly found in other Arizona communities.

Minor Final Plat Amendment Review Criteria

The request would establish the following review criteria to be used by the planning and zoning administrator in the evaluation of minor amendments:

1. Must be in substantial conformance with the approved subdivision design (e.g. lot number and pattern, street configuration, subdivision boundary, etc.)
2. No material changes to the terms or conditions of the approved Final Plat
3. No changes to open space designation
4. No adverse impacts to an adjacent property as determined by the planning and zoning administrator and/or town engineer

The goal of the proposed review criteria is to maintain the key elements of an approved subdivision design, such as open space, lot number and pattern, street configuration, main subdivision access and conditions of approval. The proposed criteria will ensure Minor Final Plat Amendments are in substantial conformance with the approved subdivision plat and do not result in an adverse impact to adjoining properties.

Public Notification and Comment

Public notice has been provided as follows:

- All HOAs in the Town

- Public hearing notice was posted:
  - In the Territorial newspaper
  - At Town Hall
  - On the Town website

General Plan Compliance

There are no specific policies in the General Plan relative to the request.

Planning and Zoning Commission Action

The request was heard by the Planning and Zoning Commission on March 1, 2016. The discussion at the public hearing focused on the proposed definition and review criteria for Minor Final Plat Amendments.

At the conclusion of the public hearing, the commission recommended approval based on the finding that the request would enable the planning and zoning administrator the ability to approve minor amendments to an approved Final Plat. The Planning and Zoning Commission staff report and minutes are provided as Attachments 4 and 5 respectively.

FISCAL IMPACT:

N/A

SUGGESTED MOTION:

I MOVE to adopt Ordinance No. (O)16-06, amending Section 22.9 of the Oro Valley Zoning Code relating to Minor Final Plat Amendments, finding the amendment would allow the ability to approve minor changes which are consistent with the approved subdivision plat.

OR

I MOVE to deny Ordinance No. (O)16-06, amending 22.9 of the Oro Valley Zoning Code relating to Minor Final Plat Amendments, finding

_____.

Attachments

Attachment 1 - (O)16-06

Attachment 2 - Other Jurisdictions Criteria

Attachment 3 - Planning Work Plan

Attachment 4 - Planning and Zoning Commission Staff Report

Attachment 5 - Planning and Zoning Commission Minutes

ORDINANCE NO. (O)16-06

AN ORDINANCE OF THE TOWN OF ORO VALLEY, ARIZONA, AMENDING CHAPTER 22, REVIEW AND APPROVAL PROCEDURES, SECTION 22.9.F, FINAL PLAT, OF THE ORO VALLEY ZONING CODE REVISED RELATED TO MINOR FINAL PLAT AMENDMENTS; REPEALING ALL RESOLUTIONS, ORDINANCES AND RULES OF THE TOWN OF ORO VALLEY IN CONFLICT THEREWITH; PRESERVING THE RIGHTS AND DUTIES THAT HAVE ALREADY MATURED AND PROCEEDINGS THAT HAVE ALREADY BEGUN THEREUNDER

WHEREAS, on March 13, 1981, the Mayor and Council approved Ordinance (O)81-58, which adopted that certain document entitled "Oro Valley Zoning Code Revised (OVZCR)"; and

WHEREAS, it is necessary to amend Chapter 22, Review and Approval Procedures, Section 22.9.F, Final Plats, to establish a formal review process and requirement for Minor Final Plat Amendment applications; and

WHEREAS, a minor amendment is a request to modify an approved subdivision plat; and

WHEREAS, the proposed amendment would establish criteria within the existing zoning provisions to determine what constitutes a Minor Final Plat Amendment which could be administratively approved by the Planning and Zoning Administrator; and

WHEREAS, the Planning and Zoning Commission held a meeting on March 1, 2016 and voted to recommend approval of amending Chapter 22, Review and Approval Procedures, Section 22.9.F, Final Plat; and

WHEREAS, the Mayor and Council have considered the proposed amendment to Chapter 22, Review and Approval Procedures, Section 22.9.F, Final Plat and finds that it is consistent with the Town's General Plan and other Town ordinances and are in the best interest of the Town.

NOW, THEREFORE, BE IT ORDAINED by the Mayor and Town Council of the Town of Oro Valley that:

SECTION 1. that certain document entitled Chapter 22, Review and Approval Procedures, Section 22.9.F, Final Plat, of the Oro Valley Zoning Code Revised, attached hereto as Exhibit "A" and incorporated herein by this reference, establishing a formal review process and requirement for Minor Final Plat Amendment applications is hereby approved and declared a public record on May 4, 2016 is hereby adopted.

SECTION 2. All Oro Valley ordinances, resolutions or motions and parts of ordinances, resolutions or motions of the Council in conflict with the provision of this Ordinance are hereby repealed.

SECTION 3. If any section, subsection, sentence, clause, phrase, or portion of the resolution or any part of the General Plan Amendment adopted herein is for any reason held to be invalid or

unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

PASSED AND ADOPTED by the Mayor and Council of the Town of Oro Valley, Arizona this 4th day of May, 2016.

TOWN OF ORO VALLEY

_____
Dr. Satish I. Hiremath, Mayor

ATTEST:

_____
Julie K. Bower, Town Clerk

Date: _____

APPROVED AS TO FORM:

_____
Tobin Sidles, Legal Services Director

Date: _____

EXHIBIT “A”

Zoning Code Amendment
Proposed Text

Additions shown in ALL CAPS

SECTION 22.9.F.8 FINAL PLAT AMENDMENTS

THE PLANNING AND ZONING ADMINISTRATOR SHALL BE PERMITTED TO APPROVE MINOR PLAT AMENDMENTS ACCORDING TO THE FOLLOWING:

A. MINOR PLAT AMENDMENTS INCLUDE:

I. SCRIVENER'S ERRORS WHICH ARE UNINTENTIONAL CLERICAL MISTAKES MADE DURING THE DRAFTING, PUBLISHING OR COPYING PROCESS. SCRIVENER'S ERRORS INCLUDE CORRECTED COURSES, DISTANCES, MONUMENTATIONS, PROPERTY INFORMATION, UPDATED STREET NAMES, AND SIMILAR TECHNICAL ITEMS.

II. ADJUSTMENTS TO UTILITY EASEMENTS AND BUILDING PADS.

III. PROPERTY LINE MODIFICATIONS WITH CONCURRENCE FROM ALL AFFECTED PARTIES.

IV. ADJUSTMENTS TO FLOODPLAIN AND EROSION HAZARD BOUNDARIES AS APPROVED BY THE TOWN ENGINEER.

V. DRIVEWAY RELOCATIONS AS APPROVED BY THE TOWN ENGINEER.

B. REVIEW

CRITERIA TO EVALUATE MINOR PLAT AMENDMENTS INCLUDE:

I. MUST BE IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED SUBDIVISION DESIGN (E.G., LOT NUMBER AND PATTERN, STREET CONFIGURATION, SUBDIVISION BOUNDARY, ETC.).

II. NO MATERIAL CHANGES TO THE TERMS OR CONDITIONS OF THE APPROVED FINAL PLAT.

III. NO CHANGES TO OPEN SPACE DESIGNATION.

IV. NO ADVERSE IMPACTS TO AN ADJACENT PROPERTY, AS DETERMINED BY THE PLANNING AND ZONING ADMINISTRATOR AND/OR TOWN ENGINEER.

C. DECISION AND FINDINGS

I. IF IT IS DETERMINED THAT THE PROPOSED FINAL PLAT AMENDMENT COMPLIES WITH THE MINIMUM REQUIREMENTS OF THIS SECTION, THE APPROVED AMENDMENT SHALL BE SENT TO THE PIMA COUNTY RECORDER'S OFFICE FOR RECORDATION.

II. IF IT IS DETERMINED THAT THE PROPOSED FINAL PLAT AMENDMENT DOES NOT COMPLY WITH THE MINIMUM REQUIREMENTS OF THIS

SECTION, A LETTER OF DENIAL SHALL BE ISSUED TO THE APPLICANT INFORMING THEM THAT THE REQUEST REQUIRES A TOWN COUNCIL APPROVAL IN ACCORDANCE WITH SECTION 22.9.F.7 OF THE ZONING CODE.

Review Criteria Summary Table
Minor Final Plat Amendment Review Criteria
April 6, 2016, Town Council

	Scrivenor's errors	Adjustments to building pads and utility easement	Property line modifications (no new lots)	Adjustments to floodplain and erosion hazard boundaries	Driveway relocations
Casa Grande	X	X	X	n/a	n/a
Mesa	X	X	X	X	X
Phoenix	X	X	X	X	X
Scottsdale	X	n/a	X	X	n/a
Tucson	X	X	X	X	n/a

X = Allows administrative approval

n/a = Not shown on subdivision plats

Attachment 2

ATTACHMENT 1 - PLANNING WORK PLAN FY 15/16 - 16/17

Planning and Zoning Commission Recommended Draft April 7, 2015

PROJECT	POLICY REF	SOURCE	TIMEFRAME / RESOURCES	PRIORITY	DESCRIPTION
1. GENERAL PLAN UPDATE (Your Voice, Our Future)	ARS 9-461.06	General Plan State Law 2013 Strategic Plan	2013 - 2016 / Staff	HIGH	Background Studies Surveys and Communications Committee Work Draft Plan & Ratification
2.THE DISTRICT	Goal 9.1 9.1.5 & 9.1.6	WP 13-15 YVOF - GP Update 2013 & 2015 Strategic Plans	Winter 2015 / Staff	HIGH	Stakeholder Outreach Design / Draft Plan Code Implementation, including overlay
2a. FORM BASED CODE (To implem. The District)	1.1.1 1.3.4	WP 13-15	Spring 2016 / Staff	HIGH	Determine Viability Evaluate Alternatives Code Implementation
2b. COMPLETE STREETS POLICY (To implem. The District and for use in other areas)	1.3.6 & 5.1.5 Goal 5.1 Goal 5.6	2013 & 2015 Strategic Plans	Fall 2016 / Staff	HIGH	Research Best Practices Develop Policy Code Implementation
2c. MIXED USE (To implem. The District and for use in other areas)	1.3.3 & 1.3.4	WP 13-15	Spring 2016/ Staff	HIGH	Determine Viability Evaluate Alternatives Code Implementation
3. ARROYO GRANDE TANGERINE 550	3.1.3	WP 10-12 2013 & 2015 Strategic Plans	Unknown / Staff	HIGH* *Becomes priority upon Council direction	Pending Council direction and State's readiness to act

Attachment 3

ATTACHMENT 1 - PLANNING WORK PLAN FY 15/16 - 16/17

Planning and Zoning Commission Recommended Draft April 7, 2015

PROJECT	POLICY REF	SOURCE	TIMEFRAME / RESOURCES	PRIORITY	DESCRIPTION
4. ZONING CODE AMENDMENTS					
a. Parking	2015 Strategic	WP 13-15	Fall 2016 Staff	MEDIUM	Update categories and ratios
b. Permitted Use Table	2015 Strategic	New	Fall 2016 Staff	MEDIUM	Update use listings in all districts
c. Conditional Use Permits	2015 Strategic	WP 13-15	Fall 2015 Staff	MEDIUM	Evaluation Criteria, uses and process
d. Senior Care	7.1.3 & 7.2.4	WP 13-15	Summ 15 Staff	MEDIUM	Definitions and development standards
e. Minor Plat Amendment	2015 Strategic	WP 13-15	Fall 2015 Staff	LOW	Establish formal process and req's
f. Setback Projections	2015 Strategic	WP 13-15	Sprg 16 Staff	LOW	Address projections comprehensively
g. Wireless Facilities	Goal 2.1	WP 13-15	Sprg 15 Staff	LOW	Clarify stealth req's, update per fed law
h. Minor Setback Reduct	2015 Strategic	WP 13-15	Sprg 17 Staff	LOW	Establish process for minor adjust's
					ATTACHMENT 1

Code Amendment for Minor Final Plat Amendments
Planning and Zoning Commission Staff Report

CASE NUMBER: OV1600278

MEETING DATE: March 1, 2016

AGENDA ITEM: 4

STAFF CONTACT: Rosevelt Arellano, Senior Planner
rarellano@orovalleyaz.gov (520) 229-4817

Request: Zoning Code Amendment related to Minor Final Plat Amendments

Recommendation: Recommend approval

SUMMARY:

The purpose of this code amendment is to establish a formal review process and requirements for Minor Final Plat Amendment applications. A minor amendment is a request to modify an approved subdivision plat, which does not affect the key components of an approved subdivision design, such as lot number and pattern, street configuration, open space and main access.

Section 22.9.F of the Zoning Code establishes the process and requirements related to subdivision plat approval. The existing zoning provisions do not provide any clear process nor requirements for Minor Final Plat Amendments, which are currently processed according to administrative policy.

A recent case has illuminated the need to evaluate the current administrative policy due to the Town's exposure to potential lawsuits. Subsequently, the Planning Division Work Plan approved in 2015 included an item to establish zoning requirements for Minor Final Plat Amendments.

The proposed code amendment (Attachment 1) would establish criteria within the existing zoning provisions to determine what constitutes a Minor Final Plat Amendment and therefore could be administratively approved by the Planning and Zoning Administrator.

BACKGROUND:

The review of the Town's Minor Final Plat Amendment applications is one of the top priorities of the Planning Division Work Plan (Attachment 2). The goal of this work plan item is to establish the formal review process and criteria for Minor Final Plat Amendments. This would then reduce the Town's liability related to the administrative review and approval process.

Timeline

Below is a timeline of key dates regarding the proposed code amendment:

- 2011: Subdivision regulations approved by Town Council
- February 2015: Minor Final Plat Amendment case illuminates the need for establishing a formal review process and requirements
- May 2015: Town Council approves Planning Division Work Plan directing staff to evaluate the Minor Final Plat Amendment application process

DISCUSSION/ANALYSIS:

The proposed code amendment (Attachment 1) would enable the Planning and Zoning Administrator the ability to administratively approve limited changes to an approved subdivision plat when the applicant's request meets the minimum requirements, summarized below.

The proposed code amendment is based on staff's review and analysis of numerous jurisdictions and associated review criteria. Attachment 3 includes a summary that represents a range of approaches related to the proposed code amendment.

Final Plat Amendments which do not meet the below requirements shall be processed as a Major Final Plat Amendment and require Town Council approval.

Definition of a Minor Final Plat Amendment

The proposed code amendment (Attachment 1) would allow the following changes to an approved subdivision plat to be administratively reviewed and approved:

1. Scrivener's errors which are unintentional clerical mistakes made during the drafting, publishing or copying process. Scrivener's errors include corrected courses, distances, monumentations, property information, updated street names, and similar technical items.
2. Adjustments to utility easements and building pads.
3. Property line modifications with concurrence from all affected parties.
4. Adjustments to floodplain and erosion hazard boundaries as approved by the Town Engineer.
5. Driveway relocations as approved by the Town Engineer.

Staff Comment: The proposed code amendment will enable the Planning and Zoning Administrator the ability to approve minor, common sense changes to an approved subdivision plat. This will allow an efficient process to correct clerical errors and other non-material changes, such as adjustments to utility easements and shared property lines.

Minor Final Plat Amendment Review Criteria

The proposed code amendment would establish the following review criteria:

1. *Must be in substantial conformance with the approved subdivision design (e.g., lot number and pattern, street configuration, subdivision boundary, etc.).*

2. *No material changes to the terms or conditions of the approved Final Plat.*

3. *No changes to open space designation.*

4. *No direct impacts to an adjacent property as determined by the Planning and Zoning Administrator and/or Town Engineer.*

Staff Comment: The goal of the proposed review criteria is to maintain the key elements of an approved subdivision design, such as open space, lot number and pattern, street configuration and main access. The proposed criteria represents a reasonable and substantial code update that will ensure Minor Final Plat Amendments are in substantial conformance with the approved subdivision plat and do not have direct impacts to adjacent properties.

SUMMARY:

In summary, the proposed code amendment will enable the Planning and Zoning Administrator the ability to approve Minor Final Plat Amendments, while providing appropriate restrictions to ensure that the key design elements, terms and conditions of the approved subdivision plat are maintained.

GENERAL PLAN COMPLIANCE:

The General Plan does not contain any goals or policies which provide specific guidance on the proposed amendment.

PUBLIC PARTICIPATION:

Public notice has been provided as follows:

- All HOAs in the Town were notified of this hearing
- Public hearing notice was posted:
  - In the Territorial newspaper
  - At Town hall
  - On the Town website

RECOMMENDATION:

Based on the following findings:

- The proposed amendment would enable the Planning and Zoning Administrator the ability to approve limited changes to an approved subdivision plat and require significant changes to be considered by the Town Council only.
- The proposed amendment would reduce the Town's liability related to the administrative review and approval of Minor Final Plat Amendments.
- The proposed amendment establishes appropriate restrictions to ensure that the key design elements, terms and conditions of the approved subdivision plat are maintained.

It is recommended that the Planning and Zoning Commission take the following action:

Recommend approval to the Town Council of the requested Zoning Code Amendment OV1600278.

SUGGESTED MOTIONS:

The Planning and Zoning Commission may wish to consider the following suggested motion:

I move to recommend approval of the Zoning Code Amendment in Attachment 1 related to Final Plat Amendments, based on the finding that the request would enable the Planning and Zoning Administrator the ability to approve limited changes to an approved subdivision plat.

OR

I move to recommend denial of the Zoning Code Amendment in Attachment 1 related to Final Plat Amendments, as the request does not meet the finding that _____.

ATTACHMENTS:

1. Proposed Code Amendment
2. 2015 Planning Division Work Plan
3. Review Criteria Table

<for>

Bayer Vella, Planning Manager

MINUTES
ORO VALLEY PLANNING AND ZONING COMMISSION
REGULAR SESSION
March 1, 2016
ORO VALLEY COUNCIL CHAMBERS
11000 N. LA CAÑADA DRIVE

REGULAR SESSION AT OR AFTER 6:00 PM

CALL TO ORDER

Chair Leedy called the March 1, 2016 Regular Session of the Oro Valley Planning and Zoning Commission meeting to order at 6:00 PM.

ROLL CALL

PRESENT:	Greg Hitt, Commissioner Tom Drzazgowski, Commissioner Tom Gribb, Commissioner Charlie Hurt, Vice-Chair Bill Leedy, Chair
EXCUSED:	Melanie Barrett, Commissioner Bob Swope, Commissioner
ALSO PRESENT:	Joe Hornat, Council Member Lou Waters, Vice-Mayor Joe Andrews, Chief Civil Deputy Attorney

PLEDGE OF ALLEGIANCE

Chair Leedy led the Planning and Zoning Commission members and audience in the Pledge of Allegiance.

CALL TO AUDIENCE

There were no speaker requests.

COUNCIL LIAISON COMMENTS

Council Member Hornat updated the Planning and Zoning Commission and audience on the following:

January 20th Council Meeting:

- Temporary Sign Code was extended (A-frames and banners)
- Criminal History Box on employment applications proposed to be removed was denied
- Sign Brightness was sent back to staff
- Window signs, there was push to get rid of LED signs
- Veterans Memorial at Naranja Park, a group of citizens would like to place a first responders memorial

February 3rd Council Meeting:

- Signs in the right-of-way

REGULAR SESSION AGENDA

1. REVIEW AND/OR APPROVAL OF THE FEBRUARY 2, 2016 REGULAR SESSION MEETING MINUTES

MOTION: A motion was made by Vice-Chair Hurt and seconded by Commissioner Gribb to approve the February 2, 2016 Regular Session Meeting Minutes.

MOTION carried, 5-0.

2. PUBLIC HEARING: DISCUSSION AND POSSIBLE ACTION REGARDING A TYPE II HOME OCCUPATION FOR A LANDSCAPING BUSINESS AT 11885 N. GRAY EAGLE AVE, OV1600204

Patty Hayes, Zoning Plans Examiner, provided a presentation that included the following:

- Purpose
- Location
- Property
- Proposal
- Conclusion

Brian Ambrose, Applicant, provided a presentation that included the following:

- Overview of the business
- No employees for the business, other than himself
- No equipment will be housed at the residence

Bayer Vella, Planning Manager, commented that the street is public and should a trailer be brought on site it would constitute a zoning violation. This permit would not allow that.

Brian Ambrose, applicant asked the Commission if he was able to park a small landscape trailer in the side yard. There is a fenced in area where a previous boat was

housed. The Home Owner's Association (HOA) wants to make sure it is unseen from the street.

Mr. Vella responded that the code provides the statement that there should be no outdoor, open operations, storage or display of materials. The key part is how much of it is screened from the street and the neighbor's. As long as it's not visible in any form or fashion, it would be allowed.

Chair Leedy opened the public hearing.

Jonathan Oleott, Esq., non-resident of Oro Valley and attorney for the Copper Creek HOA. Mr. Oleott states he has reviewed the application and staff report and would like to put in the record, as long as the applicant proceeds as represented in the application and it conforms to the Convents, Conditions and Restrictions (CC&R), he has no problems with the proposed application. The HOA would have to validate the trailer issue on its own, he is not prepared at this time to do that.

Dr. Don Cox, Oro Valley resident, stated he does not have a problem the people running small businesses out of their home. It is not really clear at what point do you have to move from your residence to other property that accommodates your business. Dr. Cox's concern that the nature of this business would facilitate equipment trailers and unless the fences around the property are raised up to considerably, it will remain visible from the street. This will have an impact on the property values relative to his being able to sell his home.

Kathleen Nicholson, Oro Valley resident, stated that she has no problem with the application and she wishes Mr. Ambrose good luck.

Brad Smith, Oro Valley resident, stated he supports the proposed application and does not see a problem with a small trailer.

Chair Leedy closes the public hearing.

MOTION: A motion was made by Commissioner Drzazgowski and seconded by Vice-Chair Hurt to approve OV1600204, a Type II Home Occupation Permit for a landscaping business at 11885 N. Gray Eagle Ave., based on the finding that the proposed use is in conformance with the Zoning Code Standards for Type II Home Occupations.

MOTION carried, 5-0.

3. PUBLIC HEARING: DISCUSSION AND POSSIBLE ACTION REGARDING A ZONING CODE AMENDMENT RELATED TO SIGN LIGHTING STANDARDS, OV1500769

Patty Hayes, Zoning Plans Examiner, proved a presentation that included the following:

- Purpose
- Sign Lighting
- Wall Signs with LED lighting
- Kelvin Measurement
- Kelvin Temperature of LED Wall Signs
- Message Board with LED
- Nit Measurements
- Nits for Message Boards with LED
- Enforcement
- General Plan
- Recommendation

Chair Leedy opened the public hearing.

Don Bristow, Oro Valley resident, stated he is in support of the proposal. His concern is with all the change in technology, what if people come up light that is brighter than the LEDs. Does this ordinance give the Town the control should a new light come available?

Bayer Vella, Planning Manager, responded that maybe five years from now we will be having another conversation about standards because there is a new technology. With this adoption and whatever is used will have to meet or approximate that standard. Right now we are focused on the number one source of lighting that is currently being used, which is LED.

Dave Perry, Oro Valley resident and President and CEO of the Greater Oro Valley Chamber of Commerce. Mr. Perry stated he agrees with previous speakers on the proposal and it is much more preferable than some of the suggestions heard by Town Council in regard to night time inspections. He would also like to express his appreciation to staff for exploring other neighboring communities standards. LED is the technology of the future, the technology of right now is better for the planet and less expensive for the merchant to apply to their business. The most important thing in terms of our support regards to the language about enforcement of the code, let's set the standards, confirm at the permit stage and expect the business community to adhere to them.

Chair Leedy closed the public hearing.

MOTION: A motion was made by Commissioner Gribb and seconded by Vice-Chair Hurt to recommend approval of the zoning code amendment to Chapter 27 and 28, establishing lighting standards for signs.

MOTION carried, 4-1 with Commissioner Drzazgowski opposed.

4. PUBLIC HEARING: DISCUSSION AND POSSIBLE ACTION REGARDING A ZONING CODE AMENDMENT RELATED TO MINOR FINAL PLAT AMENDMENTS, OV1600278

Rosevelt Arellano, Senior Planner, provided a presentation that included the following:

- Purpose
- What is a Final Plat?
- What is a Final Plat Amendment?
- Best practices
- Proposed Minor Flat Plat Amendments
- Proposed Administrative Review Criteria
- Summary and Recommendation

Chair Leedy opened the public hearing.

No speakers request.

Chair Leedy closed the public hearing.

MOTION: A motion was made by Commissioner Hitt and seconded by Commissioner Gribb to recommend approval of the Zoning Code Amendment in Attachment 1 related to Final Plat Amendments, based on the finding that the request would enable the Planning and Zoning Administrator the ability to approve limited changes to an approved subdivision plat.

MOTION carried, 5-0.

5. PUBLIC HEARING: DISCUSSION AND POSSIBLE ACTION REGARDIG A ZONING CODE AMENDMENT RELATED TO ACCESSORY SUITES, OV1501735

Chad Daines, Principal Planner, provided a presentation that included the following:

- Purpose
- Current Zoning Code
- Goals of Amendment
- Definitions and Development Standards
- General Plan
- Summary and Recommendation

Tom Gansheimer, President of Lennar Homes, representing the applicant, provided the presentation that included the following:

- Multi-Generational Living
- Next Gen, The Home Within A Home

- Floor Plan
- Actual use Lennar have tracked
- Code Amendment to allow a range/cooktop

Chair Leedy opened the public hearing.

No speakers request.

Chair Leedy closed the public hearing.

MOTION: A motion was made by Commissioner Drzazgowski and seconded by Vice-Chair Hurt to recommend approval of the Zoning Code Amendment in Attachment 1 related to Accessory Suites, based on the findings in the staff report with staff's request that minor wording changes can be made without changing the content.

MOTION carried, 5-0.

6. YOUR VOICE, OUR FUTURE PHASE 3 PROJECT UPDATE

Chair Leedy provided the following presentation that included the following:

- Final stages leading up to the vote
- Staff is trying to inspiring voters
- A Your Voice, Our Future document this summer to prepare for voting
- The comments from the community are very positive

PLANNING UPDATE (INFORMATIONAL ONLY)

Bayer Vella, Planning Manager, presented the following presentation that included:

- Town Council, March 2nd Planning items
- Town Council, March 16th meeting has been cancelled

- Planning and Zoning Commission, April 5th meeting, Community Academy Training Session

- Freddy's/ Native Grill and Wings Neighborhood Meeting, March 3rd
- Moore Road and Rancho Vistoso Boulevard Proposed Conceptual Site Plan Neighborhood Meeting, March 23rd

ADJOURNMENT

MOTION: A motion was made by Vice-Chair Hurt and seconded by Commissioner Drzazgowski to adjourn the Planning and Zoning Commission meeting at 7:15 PM.

MOTION carried, 5-0.

Town Council Regular Session **Item # 4.**

Meeting Date: 05/04/2016

Requested by: Paul Keesler

Submitted By: Aimee Ramsey, Development Infrastructure Services

Department: Development Infrastructure Services

Information

SUBJECT:

PUBLIC HEARING: RESOLUTION NO. (R)16-16, AUTHORIZING AND APPROVING AN INCREASE TO THE BASE RATE FOR THE STORMWATER UTILITY FEE, REPLACING RESOLUTION NO. (R)07-127

RECOMMENDATION:

On January 21, 2016, the Stormwater Utility Commission voted to recommend approval of the Preferred Financial Scenario in the Stormwater Rates Analysis Report (attachment 3). The attached resolution (attachment 1) with the Stormwater fee schedule changes increasing Stormwater Utility rate (attachment 2) reflects this recommendation by the Stormwater Utility Commission. Staff recommends Council approval of the attached resolution increasing the base rate for the Stormwater Utility fee.

EXECUTIVE SUMMARY:

A Stormwater Rates Analysis Report was developed over the past 24 months by the Stormwater Utility Commission, and upon review of the current rate, it had been determined that the current rate would be insufficient to cover the costs of stormwater management and to provide for the operation, maintenance, and capital improvements of the stormwater system in the Town. The Stormwater Utility has produced a Stormwater Rate Analysis Report due to the fact that the projected FY 2017 budget depicted an ending cash balance of the fund less than the 15% required by code.

This proposal increases the base Stormwater rate from $2.90 to $4.50 and is estimated to generate approximately $448,000 annually ($351,000 from residential fee revenue and $97,000 commercial fee revenue).

- Impact to each residence – an additional $1.60 per month will be added
- Commercial properties will experience an increase dependent on size

If the attached resolution is approved, the new rate will become effective June 4.

BACKGROUND OR DETAILED INFORMATION:

Pursuant to A.R.S. § 9-511.01 and on March 2, 2016, the Council adopted a Notice of Intent to increase Stormwater Utility rates, establishing a public hearing for May 4, 2016. The Stormwater Rates Analysis Report was made available for public review by placing a copy of the report in the Town Clerk's office, the Stormwater Utility office and on the Stormwater Utility's webpage on March 3, 2016. It was also published in the Daily Territorial on March 7, 2016 (attachment 4).

Utility and Fee Rate History

The Town's Stormwater Utility has been in place since 2004, with a fee structure in place since 2007. The Utility was created to fulfill federally-mandated Environmental Protection Agency (EPA) minimum requirements to regulate pollutants that may enter our waterways. The EPA required the Town to obtain a Municipal Separate Storm Sewer Systems (MS4) permit, which regulates the overall stormwater quality of this region. The permit requires the Town to implement and comply with each of the following six activities, referred to as Minimum Control Measures:

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination

• Construction Site Stormwater Runoff Control
• Post-Construction Stormwater Management in New and Re-development
• Pollution Prevention/Good Housekeeping for Municipal Operations

In addition to the MS4 permit, the EPA also requires the Town to obtain and adhere to a National Pollutant Discharge Elimination System General Permit and Construction General Permit. Both permits carry rules and regulations that touch on the above mentioned list.

The original Stormwater Utility fee that was established in 2007 is still in place today. It was created to provide the Town the fiscal resources needed to adhere to the above mentioned EPA rules and regulations. In addition to regulation compliance, the fee also provides for small stormwater construction and clean-up projects (vegetation clearing in washes) and larger project research and draft plans that could be submitted to the county for large scale project consideration.

On average, the Town has been receiving $720,000 per year in Stormwater Utility fee revenue. The fee itself is broken down into two components: the residential component, for which each single family residence within the Town is assessed a monthly fee of $2.90 per month regardless of the size of the residence; and monthly commercial assessment, which is determined by multiplying the base rate of $2.90 per month by the amount of impervious surface (rooftops, driveways, sidewalks, parking lots) on property divided by an Equivalent Residential Unit (ERU), which is presently 5,000 sq. ft.

The Stormwater fee has been funding the Town's ability to adhere to the federal stormwater quality issues mentioned above as well as trying to maintain the capacity within the drainage passage infrastructure throughout the Town. The infrastructure consists of over 50 linear miles of public washes and is coordinated with various HOAs on over 146 linear miles of private washes, including a multitude of culvert, outflow devices and basin maintenance.

Reason for Fee Increase
Due to new technologies and increased awareness of stormwater quality impacts to natural wash systems, combined with rule changes within the EPA permits, the Town is required to do more stormwater management than it currently has resources to accomplish. The two recent events over the past couple of years are great examples for the need to increase Stormwater Utility activities:

• In February 2014, the Town's Stormwater management was audited by representatives of Arizona Department of Environmental Quality (ADEQ) and EPA. The Town was found deficient in 13 areas ranging from suggestions of better permit compliance practices up to not adhering to recent regulatory rule changes.

• The September 8, 2014 storm that highlighted weaknesses within much of the Town's central stormwater infrastructure's ability to protect property and convey runoff to the region's major washes.

What the ordinance change will fund
The Stormwater Utility Commission evaluated several scenarios ranging from basic one-year sustainability to fully funding large capital improvement projects. The Preferred Funding Scenario (PFO) assumes that the Town is provided adequate resources to meet minimum state requirements and fully develop a capital improvement program. The PFO does not fund major capital improvement projects at this time, due to the lack of specificity and required analysis on each project. Staff recommendations are based on a rates analysis to assure the proposal meets Town policies, provide funding to meet state requirements and develop a capital improvement plan to address deficits in our Stormwater infrastructure. More specifically, the funding will provide resources to add three additional FTEs to achieve the following:

• Be MS4 Compliant – meet all 13 of the deficiencies highlighted during the EPA/ADEQ audit. This is a federal and state mandate
• Develop, implement and monitor a Stormwater Pollution Prevention Plan. This is a federal and state mandate
• Increase inspection activities for private development projects – federal and state mandate
• Fully develop an Infrastructure Assessment program to identify and maintain the current capacity - includes inventorying and mapping of the entire infrastructure system which is similar to our current Pavement Preservation program for street maintenance
• Program and design new and additional infrastructure to enhance community safety and discharge quality, which will allow the Town to either plan with additional future resources or request additional funding from outside agencies such as Pima County Regional Flood Control District to build these stormwater facilities
• Construct some small projects that address local, critical drainage issues

On January 21, 2016, the Stormwater Utility Commission voted to recommend approval of the Preferred Financial Scenario in the Stormwater Rates Analysis Report.

Impact of Ordinance Change
It is estimated a total of $516,000 annually is needed to accomplish the above mentioned outstanding tasks. In order to generate this additional revenue, there are two separate proposals being considered, raising the base fee rate and decreasing the ERU.

1. Considered with this resolution - Fee Increase - Proposal to increase base Stormwater rate from $2.90 to $4.50 will generate approximately $448,000 annually ($351,000 from residential fee revenue and $97,000 commercial fee revenue).
   • Impact to each residence – an additional $1.60 per month will be added
   • Commercial properties will experience an increase dependent on size
   This revises the rate structure established in Resolution (R)07-127 (Attachment 6)

2. Proposal to reduce ERU of impervious area from 5,000 to 4,000 sq. ft. - This is being considered within the other

- Stormwater ordinance being presented this evening.

Without the rate increase, the Stormwater Utility will not have the resources to meet the increasing code mandates placed on the Town by both the federal (EPA) and state (ADEQ) jurisdictional authorities. In addition, we will not have the ability to increase our present infrastructure carrying capacity to help increase public protection from flooding and erosion. Both of these issues affect the Town's responsibilities for quantity and quality of our stormwater system.

The Stormwater Rates Analysis Report includes projections for five years; however, Stormwater rates will be reviewed annually. The Preferred Financial Scenario is a two-tiered approach structure and decreasing the ERU without the correlating base rate increase will not meet all revenue requirements and cash reserve requirements for the Stormwater Utility.

To date, six comments have been received (attachment 5).

FISCAL IMPACT:

The anticipated base rate adjustment is anticipated to generate approximately $448,000 per year for the utility. Without the fee increase, the Stormwater Utility will not have the resources to meet the increasing code mandates placed on the Town by both the federal (EPA) and state (ADEQ) jurisdictional authorities. In addition, we will not have the ability to increase our present infrastructure carrying capacity to help increase public protection from flooding and erosion. Both of these issues affect the Town's responsibilities for quantity and quality of our stormwater system.

SUGGESTED MOTION:

I MOVE to (approve or deny) Resolution No. (R)16-16, authorizing and approving an increase to the base rate for the Stormwater Utility fee, replacing Resolution No. (R)07-127.

Attachments

Attachment 1 - (R)16-16

Attachment 2 - Fee Schedule

Attachment 3 - Stormwater Rate Analysis Report

Attachment 4 - Public Notice

Attachment 5 - Comments Received

Attachment 6 - Resolution (R)07-127

RESOLUTION NO. (R)16-16

A RESOLUTION OF THE MAYOR AND COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA, AUTHORIZING AND APPROVING AN INCREASE TO THE BASE RATE FOR THE STORMWATER UTILITY FEE

WHEREAS, pursuant to A.R.S. 9-511, *et seq*., the Town has requisite statutory authority to acquire, own and maintain a stormwater utility for the benefit of the landowners within and without the Town's corporate boundaries; and

WHEREAS, pursuant to ARS § 9-511, *et seq*., the Town finds it necessary to increase stormwater utility base rate for the Oro Valley stormwater utility fee, which increases are described in Exhibit "A" attached hereto; and

WHEREAS, on March 2, 2016, Mayor and Council approved Resolution (R)16-12, providing Notice of Intent to increase stormwater utility base rate for the Oro Valley stormwater utility fee; and

WHEREAS, on May 4, 2016, Mayor and Council held a Public Hearing to deliberate and vote on the proposed increases in water rates, fees and charges.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Council of the Town of Oro Valley, Arizona, that:

SECTION 1. The Oro Valley Stormwater Utility increase the base rate for the stormwater utility fee, as described in Exhibit "A" attached hereto and incorporated herein by this reference, are hereby authorized and approved.

SECTION 2. The Mayor and other administrative officials of the Town of Oro Valley are hereby authorized to take such steps as are necessary to implement the increase the base rate for the Stormwater Utility fee.

PASSED AND ADOPTED by the Mayor and Council of the Town of Oro Valley, Arizona this 4th day of May, 2016.

TOWN OF ORO VALLEY

_____

Dr. Satish I. Hiremath, Mayor

ATTEST:

_____
Julie K. Bower, Town Clerk

Date: _____

APPROVED AS TO FORM:

_____
Tobin Sidles, Legal Services Director

Date: _____

EXHIBIT “A”

STORMWATER UTILITY FEE

SCHEDULE OF FEES FOR FY 2016/17

Base Rate	$ 4.50 / month
Application fee for rate reduction/credit	$100.00 (one time)*

*no change

2016

STORMWATER UTILITY

STORMWATER UTILITY RATE ANALYSIS

DATE: 01-21-2016

STORMWATER UTILITY – DEVELOPMENT & INFRASTRUCTURE SERVICES

TOWN OF ORO VALLEY | 11000 N La Canada Drive, Oro Valley, AZ 85737

Stormwater Utility Mission

To provide safe and efficient management of the Stormwater Utility, promote and protect life and safety, water quality, and the Town's working and natural environments before, during, and after the occurrence of storm events in accordance with all Town codes, standards and policies.

ORO VALLEY TOWN COUNCIL

Dr. Satish I. Hiremath, Mayor
Lou Waters, Vice Mayor
Brendan Burns, Council Member
William Garner, Council Member
Joe Hornat, Council Member
Mary Snider, Council Member
Mike Zinkin, Council Member

ORO VALLEY STORMWATER UTILITY COMMISSION

David Parker, Chair
Michael Stankiewicz, Vice Chair
Jim Mikolaitis, Commissioner
John Lynch, Commissioner
Frederick Wayand, Commissioner

TOWN STAFF

Greg Caton, Town Manager
Stacey Lemos, Finance Director
Paul Keesler P.E., Director
Aimee Ramsey, Assistant Director
Phil Trenary, Operations Manager
Michael Todnem P.E., Stormwater Sr. Civil Engineer

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PART I. Executive Summary

In Oro Valley the Stormwater program was initiated to fulfil the Environmental Protection Agency's minimum requirement to regulate first flush pollutants which may enter our waterways. The Town's Municipal Separate Storm Sewer Systems (MS4) permitted activities are part of this program and as discussed further will describe Stormwater Quality. Additionally the town has responsibilities regarding flood protection and floodplain management for our community that require maintenance and additional monitoring of aging Stormwater conveyance infrastructure hence known as Stormwater Quantity. This may require debris and sediment removal, vegetation management, facilities maintenance and possibly new facility construction for safety concerns.

The Stormwater Utility is responsible for Stormwater Quality and Stormwater Quantity. The functions and duties of the Oro Valley Stormwater Utility Commission "Commission" include reviewing and developing recommendations for Stormwater revenue requirements, Stormwater rates and fee structures. Controlling the quantity of Stormwater drainage runoff and aiding in water quality management has become essential in keeping our water safe for all of its many uses.

The Stormwater Utility has been in place since 2004 and associated fees since 2007. Since the initial rate was established no formal review of the program and associated rates has taken place. It is the intention of the Commission to annually evaluate the rates and analyze them to assure the recommendations meet Town policies and ensure the financial stability of the program and associated projects.

This Stormwater Rate Analysis Report contains detailed information on the Stormwater Utility fund. The Stormwater Utility (Utility) is an enterprise of the Town and generates revenue from rates, fees and charges and does not receive revenue from taxes or payments from the General Fund. The management of the monthly utility fees include personnel, operations and maintenance of the Small Municipal Separate Storm Sewer Systems (MS4) Program. The Utility pays the General Fund for services received including finance, human resources, information technology, legal, insurance and rental of office space. The Utility also pays the Water Department for billing and receiving of the monthly utility fee. In addition, since the Utility does not have its own maintenance crew, the Utility pays the Highway Fund for associated expenditures including street sweeping, storm cleanup and drainage channel vegetation management. The Utility also hires local contractors to complete Stormwater projects that exceed the work load capabilities of the operations street crew. This past fiscal year contract expenditures totaled just under $100,000 for contract maintenance that included culvert cleaning, erosion control/stabilization and street drainage interceptors

The Stormwater Utility Commission has made a recommendation for a Preferred Financial Scenario (PFS). The PFS has been selected to meet the mandated requirements as outlined under the Stormwater Town Code 15-24-13-H. The Town Council, by resolution, shall establish the annual (fiscal year) monthly base rate for the Stormwater Utility fee. The base rate shall be calculated to ensure adequate revenues to fund the costs of stormwater management and to provide for the operation, maintenance, and capital improvements of the stormwater system in the Town.

Under the Preferred Financial Scenario, the Operating Fund will have an approximate ending cash balance of just over $200K at the end of the five-year projection period. A cash balance of 15% (based on revenue projection) is required by Town Code. This amount preserves a balance of 17% to 25% depending on the fiscal year and the associated capital expenditure requirements. The Preferred Financial Scenario includes cash funding to preserve $50K per year for culvert and wash cleaning as well as increased expenditures on internal small projects by $80,000 per year or $400,000 over the five-year period. The Preferred Financial Scenario proposes no other new debt for capital expenditures.

This is the first year since establishment of the rate in 2007 that the rate has been reviewed. The Stormwater Rate Analysis is prepared based on the most up-to-date information available for a five-year projection period. It is important to note that there was a five-year moratorium on fee adjustments from 2007 until 2012.

Operational needs and capital improvement requirements change annually and are carefully evaluated when they are included in the analysis. The Stormwater Utility Commission over the last 18 months reviewed several scenarios, however, based on the necessary funding amounts required to meet mandated outcomes, maintenance requirements, and have a five-year sustainable rate the proposed $4.50 fee per ERU was recommended. Table 1 reflects the proposed rate changes to the Stormwater Utility fee.

Table 1

Stormwater Preferred Funding Scenario

		FY 2015/16		FY 2016/17
Monthly Stormwater Utility Fee/Unit		**Current**		**Change ERU**
Residential Rate		**$2.90**		**$4.50**
Commercial Rate		**$2.90**		**$4.50**
ERU = Square Feet		**5,000**		**4,000**
# of Units:				
Residential		17,460		17,749
Commercial		5,068		6,335
Total Units:		22,528		24,084
Revenue:				
Gross Revenues	$	783,974	$	**1,300,536**
Funding from Outside Sources	$	3,250	$	3,250
Grant Funds (one time)	$	35,000		
	$	**822,224**	**$**	**1,303,786**
Additional Revenue			**$**	**516,562**

Purpose of Fee

- Program Development – project definition
- Program Proposal – project design and costing
    - Budget development

    - CIP development
- Construction Management
    - New projects
    - Maintenance Oversight
- Increased Inspections due to State and Federal reporting regulations
    - Newly identified washes
    - Additional residential requirements
- Management of existing assets
    - Review of status of infrastructure stability
    - Service and maintenance work order schedules
    - Annual review

PART II. Program Information and Background

Why Must We Manage Stormwater?

The Town of Oro Valley administers, operates, and maintains a Stormwater Utility meant to:

- Preserve valuable natural resources
- Protect people and property
- Reduce nuisance flooding
- Improve water quality

The U.S. EPA has estimated that about 30 percent of known pollution to our nation's waters is attributable to stormwater runoff. In 1987, Congress directed U.S. EPA to develop a regulatory program to address the stormwater problem. The U.S. EPA issued regulations in 1990 authorizing the creation of a NPDES permitting system for stormwater discharges from a select group of industrial activities. The National Pollutant Discharge Elimination System (NPDES) is the administrative mechanism chosen for the stormwater permitting program. In Arizona, this program is called Arizona Pollutant Discharge Elimination System (AZPDES). An AZPDES permit is required for any point source discharge of pollutants to the Waters of the United States. Because stormwater runoff can transport pollutants to either a municipal separate storm sewer system or to the Waters of the United States, permits are required for those discharges.

ADEQ has prepared a draft 2016 Small Municipal Separate Storm Sewer System General Permit (Small MS4 GP) that is intended to succeed the 2002 Small MS4 GP (Permit No. AZG2002-002) which is currently administratively continued. The review and subsequent adoption of this general permit is scheduled to occur in early 2016. The draft general permit 2016 builds on the requirements of the previous general permit and is designed to control pollutants to the Maximum Extent Practicable (MEP). The new draft requires updates in the SWMP consistent with the specific permit requirements, implementing the program and evaluating the BMP's as an iterative process to ensure BMP effectiveness. The new draft permit will contain more specific tasks and details than the current 2002 general program and therefore require additional management and program compliance to control pollutants.

Stormwater Infrastructure

Table 2

Assets Listing	2007	2015	Change	Growth
Miles of FEMA designated floodplains/levees	18	18	0	
Miles of underground storm pipe	4.5	6.5	2.0	44%
Miles of public drainage easements	5	5	0	0%
Street catch basins/inlets	400	560	160	40%
Culverts	180	209	29	16%
Detention basins	40	127	87	218%
First flush devices	50	66	16	32%
Outfalls	150	261	111	74%
Lineal miles of mapped washes	NA	195	NA	

as of August 2015

The Arizona Department of Environmental Quality (ADEQ) conducted an audit of Oro Valley's Municipal Separate Storm Sewer System (MS4) program to assess compliance with the Town's MS4 permit and Stormwater Management Plan (SWMP) on February 26-27, 2014.

The audit included document reviews, interviews with Town program managers, and field verification inspections. During the audit, ADEQ noted areas of potential noncompliance with the permit. According to the Arizona Administrative Code (AAC.) RI8-9-A905(A)(3)(a) and 40 Code of Federal Regulations (CFR) 122.41(h), the Town is required to submit information to ADEQ regarding compliance with the Permit and the Town's Stormwater Management Plan. This plan was submitted and accepted September 30, 2015.

The Preferred Financial Scenario rate increase to $4.50 per month with a reduction in the Equivalent Residential Unit (ERU) to 4,000 square feet will allow the Stormwater Utility to meet:

- MS4 compliance and review minimums as addressed in the Stormwater Management Plan submittal (Stormwater Quality)
    - Redesign program to meet new 2016 General Permit Requirements as outlined by ADEQ
- Infrastructure Project Identification 20% to 30% level (Stormwater Quantity)
  - costing
  - design
  - build under $80K projects
- Work order development (Stormwater Quality and Quantity)
  - Prioritization of inspection and maintenance scheduling
  - increased inspections
  - increased Public Education
- Stormwater Utility Program Sustainability
  - 5 years

Note: Program sustainability only accounts for funds to preserve activities defined above. Additional County or other external funds must become available to pay for larger capital projects which will be identified. In the absence of County or other external funds, the rate structure will need to be revised again within one or two years or so that large capital projects identified by the new staff can be completed and funded by the Stormwater Utility.

Background

Oro Valley is located in northern Pima County approximately six miles north of the Tucson city limits. The valley itself was formed by the Canada Del Oro Creek that begins in the Santa Catalina Mountains. The town sits at an elevation of 2,620 feet, covers over 34 square miles and has a current population of just over 41,000. Oro Valley was incorporated in April, 1974.

The Town initially became covered by the NPDES General Permit For Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in 2004. This permit, often simply called a "Stormwater Permit," is required by the US Environmental Protection Agency and is implemented in Arizona by the Arizona Department of Environmental Quality (ADEQ). Neither the US EPA nor the State of Arizona provides any funding to Oro Valley for the operation of the Stormwater Program.

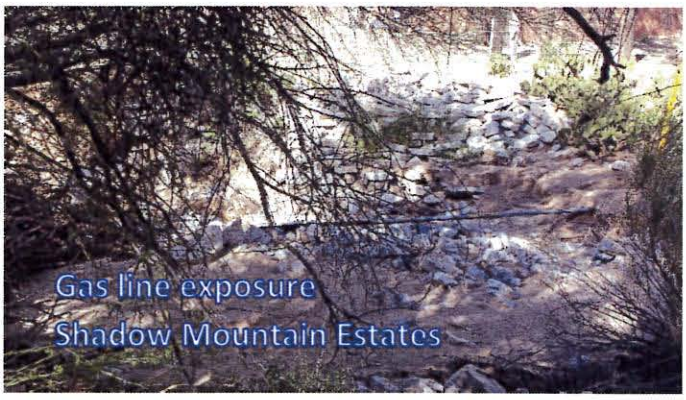
Most cities and counties with a population greater than 10,000 and/or located in an "urbanized area" as defined by the US Census must follow this permit, which regulates discharges of stormwater runoff to Waters of the United States.

Stormwater Purpose

The Stormwater Utility program is responsible for meeting all quality and quantity issues including the Town's Stormwater Management Plan, Floodplain and Erosion Hazard Management, and supporting all other Town programs that are impacted by storm events. This program also coordinates with Federal, State and local government agencies related to the Town's Stormwater program.

Typical Stormwater Utility Activities Include:

- Implementation of all MS4, ADEQ and EPA requirements
- Drainage Channel and Street Shoulder Vegetation Maintenance (Quantity)*
- Storm System Inspections and maintenance/cleaning (Quantity)of culverts, basins, grade control structures, storm sewer inlets/outlets and drainage channels
- Storm Cleanup
  - Street Sweeping (Quality) - Stormwater determination* vs Normal street surface deterioration
  - Low water crossings (Quantity/Quantity)depositing sand, rock, boulders and vegetation debris removal in roads during larger events of monsoons
- Storm generated Debris Removal* in washes (Quantity)
- Road Safety (Quantity) due to storm activity at low water crossings and shouldering due to erosion*
- Public Education and Outreach(Quality)
- Technical Support for other divisions within the Town(Quality/Quantity)



- Minor Construction and Repair Projects (Quantity)– Post storm event structural damage that endangers the public or may realize more extensive damage if not repaired immediately*
- In-House Hydrologic and Hydraulic Studies and Designs(Quantity)
- Floodplain Permit Review (Quantity/Quality)
- Stormwater Pollution Prevention Plan (SWPPP) Plan Review (Quantity)
- Development Review (Quantity/Quality)Preparing and Revising/Updating Town Ordinances and Manuals (Quality/Quantity)

The Stormwater Utility fee also reimburses the Highway Fund for utilization of the streets crews for some of the activities listed above and marked with an (*). The allocated expenditures are determined by task and scope and are assigned to the Stormwater Utility funds and are not considered routine street maintenance.

Municipal Separate Storm Sewer System (MS4) - Stormwater Quality

The permit provides requirements in each of the following six Minimum Control Measures (MCM):

1. Public Education and Outreach
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management in New Development and Re-Development
6. Pollution Prevention/Good Housekeeping for Municipal Operations

More information about each of these six main categories is provided below.

Public Education and Outreach & Public Involvement/Participation

These two related topics focus on educating and involving the public in all areas of stormwater management. Several factors associated with the program costs:

- The size of community and our target audience in order to increase Stormwater awareness
- The ability to tie into other municipal/3rd Party education programs versus developing our own
- Types of education and outreach media used
- The method of distribution through available volunteer activities/programs
- The methods of measuring success and reporting to ADEQ.

Illicit Discharge Detection and Elimination

Our Stormwater Permit requires and is dependent upon identifying and eliminating "illicit discharges." Town Code Article 15-24-14 defines the Town's Stormwater Quality Management System and Discharge Control Ordinance, passed in 2008. It defines "illicit discharges," prohibits them, and provides for enforcement options to eliminate them.

Program costs associated with eliminating "illicit discharges" are generated from the age and extent of infrastructure, the mapping status and inventory of entire drainage system. At present, services are based upon a complaint-based system versus a more costly proactive detection. Current revenue covers staffing, contractor management, equipment to detect discharges, and identify the source and cost of the actual repairs. It also includes Software cost for database management, reporting and program evaluation.

Construction Site Stormwater Runoff Control

The next requirement of the Stormwater Permit is the control of runoff from construction sites. Discharge of sediment or other waste (concrete truck washout, litter, etc.) from construction sites is prohibited by the Town.

A permit is required for any land disturbance of any size inside the Town with a few exceptions. Permit information and an application form may be picked up at the Town

located at 10000 N La Cañada Drive or may be downloaded from this website page. Please call one of the contacts at the top of the page for more information. In addition, any land disturbance totaling more than one acre requires a permit from the Arizona Department of Environmental Quality (ADEQ).

Program costs associated with this program element are dependent on the number of active construction sites, the number of development projects in the pipeline, the average number of inspections per site, and the current compliance record along with the efficiency of enforcement.

Post-Construction Stormwater Management in New Development and Re-Development

Our Stormwater Permit requires treatment of stormwater runoff from areas of new development and re-development. The cost factors associated with this part of the program are dependent upon the number of development projects requiring municipal review and inspection, the age and type of existing stormwater best management practices, future enhancement of the review process to look for and encourage a site design, land use planning for low impact development, and possible code updates to allow/foster green infrastructure.

Pollution Prevention/Good Housekeeping For Municipal Operations

The final of the six stormwater permit requirements involves the Town's own operations. The Town must evaluate all sources of potential pollution such as streets and roads, municipal parking lots, maintenance shops, outdoor storage areas, construction activities, parks maintenance and landscaping, and salt storage. Procedures to eliminate or reduce the potential for pollution must be developed, and employees must be trained on these procedures at least annually. Cost factors associated with this requirement include the number of Town facilities requiring pollution prevention plans, street sweeping and catch basin cleanout equipment and labor, and employee education and training.

Storm Mitigation

Clean up cost FY 2015 $34,000

Part III: Stormwater Utility Rate Proposal

Current Funding

Neither the State of Arizona nor the federal government provides funding for the Town's Stormwater Program. In 2007, the Town established a Stormwater Utility fee to provide funding for implementing the requirements of the Stormwater Permit and for small cleaning projects/larger project research and draft plans that could be submitted for county project consideration.

Pima County Regional Flood Control District (PCFCD) under the State of Arizona enabling legislation (Title 48 of ARS), is designated as a special taxing district and given the authority to levy secondary property tax on parcels within the Town of Oro Valley. The Town of Oro Valley and PCFCD have a very good relationship and over the past 10 years have been successful in the delivery of both large and small Stormwater projects. However, this funding is variable and not always available. In addition, the Flood Control District levy only provides funding for quantity issues and quality issues are solely the responsibility of the Town.

When the Stormwater Utility was first established, funding for projects was secured through the budgeting process and overseen by Town consultants. The FEMA Lomas Del Oro project in FY 09/10 was the last big project to be overseen by the Town. Since this time the PCFCD requests project submittals and then prioritizes them to determine which projects will move forward. This year Pima County Flood Control District has provided significant support in the area of wash maintenance. However, benefits from our partnership with PCFCD range from limited small clean up to large project and include capacity for drainage study. While a dedicated funding estimate is not available, the Town will continue to request assistance. From January through July of 2015, PCFCD contracted to have four lineal miles of debris and sediment removed, clearing existing blockages to improve channel flow and subsequently enabling mosquito abatement in areas throughout the east side of Town. Fortunately structural damage has been minimal and no major structural damage has occurred.

Pima County Regional Flood Control District and other sources
Annual Contribution to Oro Valley

Funding	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Direct	$ 3,507	$ 28,567	$ -	$ -	$ -	$ -
Projects	$ 471,000	$ -	$ 304,663	$ 290,000	$ 1,062,561	$ 731,862
Sediment Removal	$ -	$ -	$ -	$ -	$ 101,750	$ 118,600
Other Sources	$ 1,329,000	$ -	$ -	$ -	$ -	$ -

Projects
Linda Vista Gabions
Poinsetta Dr
Lomas Del Oro
La Canada Underpass to date
CDO River Park
CDO River Park Pedestrian Bridge
I10 and La Canada Underpass improvements In progress
Oracle Road Underpass improvements In progress

The PCFCD has already informed Stormwater staff that next year's funding will be limited. In addition, some items once available for funding such as low water crossings are no longer eligible for funding even though they remain a safety concern for the Town. The number of town projects is growing as more washes are identified and evaluated. Attachment E lists all known drainage and Stormwater issues regardless of size and scope that have been identified at this time. The Stormwater Utility intends to utilize part of the increased funding to develop not only a project list, but develop the designated project to a design level that will include costing scenarios for those projects under the Stormwater Utility purview. This process will allow the Town sound budgeting practices to evaluate capital improvements and identify projects to submit for potential funding from the Pima County Flood Control District. The new asset manager/engineer will be responsible for defining these projects including separating out unit costs for services/deliverables.

Current Rate

Single-family residences currently pay $2.90 per month, charged to their water bill or separately by the Town. Commercial facilities and non-profits are also charged $2.90 per "Equivalent Residential Unit" (ERU) of impervious area (driveways, patios, roofs, or other areas where stormwater does not infiltrate into the ground). At present an ERU is equal to 5,000 square feet per Town Code 15-24-13-G. The Preferred Financial Scenario includes a five year projection of the fund and evaluates the impact of future costs and revenue sources that will be required to meet those costs.

In order to cover various alternatives staff conducted an impervious area sample distribution study this year to best determine the basic ERU value. The result of the study indicates that the Town's average rounded ERU value is 3,700 square feet. The report is provided under Attachment F. Because the data used in the study may not include all impermeable surfaces, e.g. some driveways, the Commission recommends an ERU value of 4,000 square as more representative. Therefore the recommendation along with the rate adjustment is to reduce the ERU value to 4,000 sq. ft. This new ERU change will require the Town Code to be modified to reflect this new value. Along with the rate change the revised Town Code will be submitted to Town Council for consideration and approval.

National Average

There are currently 1511 Stormwater Utilities throughout the United States (Campbell, 2011). Western Kentucky University annually updates and provides access to their very extensive Stormwater Utility database as summarized in Appendix F. This survey provides us the opportunity to compare the Town's current rate structure with others nationally. However, the Western Kentucky University data survey results does not contain information about the scope of activities of responding Utilities. The Oro Valley Stormwater Utility is performing quality and quantity work whereas many survey responders may perform only quality work, so direct comparison may not be representative.

The average national rate, as of the 2014 study, was $4.01 per month. The rates range from "no fee" to $35.00 dollars per month to accommodate various programs with 10.6% of the national rates being $2.50 to $2.99, over 34.5% of the utilities have rates averaging $3.00 to $6.00 per month. In addition, for towns comparable in population to Oro Valley, approximately

256, the average monthly rate was cited as $4.26. The other noted comparison was the equivalent residential unit (ERU) value of impervious surface. Only 11.5% of the utilities had an ERU between 4,000 and 5,000 square feet. Over 22.8% classified an ERU as between 2,500 to 3,250 square feet. Many of the utilities, over 51.2% had an unspecified ERU.

Required Program Highlights

The additional funding proposed will not only provide for the sustainability of the core program, but also for increased utility infrastructure assets and associated maintenance requirements as well as fund the development of small specific community infrastructure projects.

ADEQ has prepared a draft 2015 Small Municipal Separate Storm Sewer System General Permit (Small MS4 GP) intended to succeed the 2002 Small MS4 GP (Permit No. AZG2002-002). This draft is scheduled to be adopted in early 2016, significantly changing and adding definition to the Minimum Control Measures (MCM) required by each MS4. Adoption of the new rate will provide funding for necessary staffing to ensure continued compliance.

Revenue Forecast and Requirements

Appendix A is a five year forecast for the Stormwater Utility should no rate increase occur. As depicted in the chart, the utility has a structural deficit. The FY 2016-17 recommended budget from staff would not meet the required reserve fund as outlined in the Town Code 15-24-10. A chart of the Stormwater Utility Fund is depicted in Appendix B.

The revenue forecast was based on analysis of the Stormwater Utility's monthly billing data from FY 2015-16 and a projection of growth in the number of housing units expected to be developed over the next five years. The revenue projects a flat fee not dependent on any type of usage but is only coordinated with the total number of ERU's calculated within the Town. The growth projected in residential units is determined by the Development and Infrastructure permitting staff based on trend analysis.

Appendix C provides the detailed information for moving forward with the Preferred Funding Scenario. A rate adjustment of $1.60 from $2.90 to $4.50 would provide for a stable and compliant Stormwater program. The increase is adopted through Mayor and Council resolution which was last reviewed November 7, 2007.

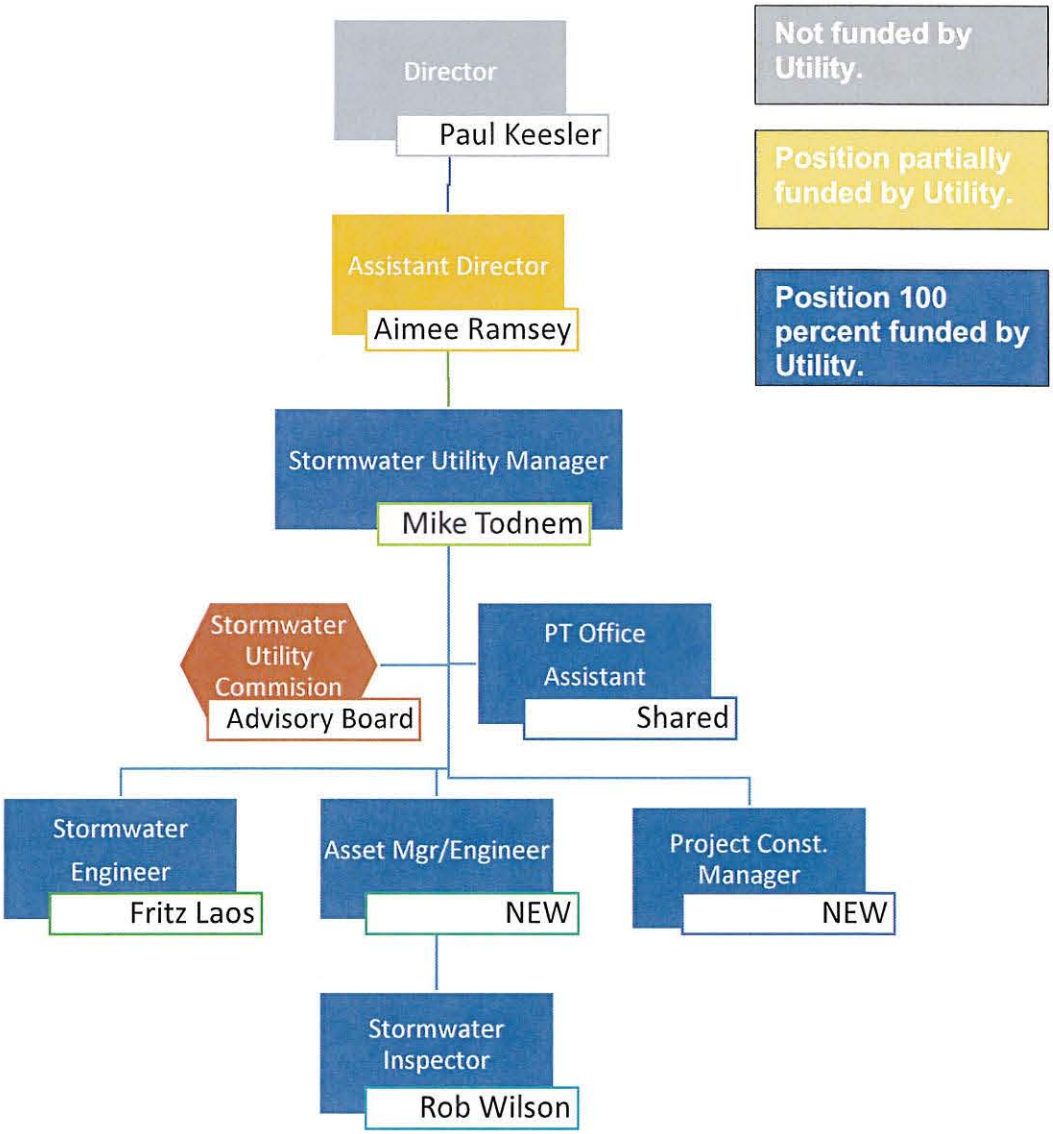
Over the past 8 years the Stormwater Management Program has developed. The opportunity presented to the Town with the initial fee structure allowed staff to develop principles and best practices to meet the requirements defined under the ADEQ MS4 program. The division produced its first annual report in 2008 and recently completed its first EPA/ADEQ Town wide audit. The program requirements to accomplish the utilities mission have been better defined and quantified revealing funding shortfalls. With the aftermath of the audit, potential future audits, and structural deficit, the rate increase is a necessity.

The future expenditures stay relatively stable and grow to meet the projected personnel costs, increase to support the Program Development, Design, Construction Management &

Maintenance program projects as outlined (see note on page 7 regarding program sustainability). In addition, the expenditures include a 3.5 percent annual merit increases. These projected increases are consistent with the General Fund's financial planning. The projected operations and maintenance (O&M) costs include inflationary increases in some areas that average 1.7 percent annually. The inflation factors were provided by the Arizona Department of Revenue.

Organization Chart

Proposed Stormwater Utility Division Structure



Maintaining our washes

Before

After

Rooney Wash

Appendices

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Appendix A – Stormwater Fund Status Quo 5 Year Forecast

Stormwater Fund 5 Year Forecast Revised: 1/22/2016

Assumes $2.90 fee/ERU

	FY 2015/16 Budgeted		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
			Draft Projected				
# of Units:							
Residential	15,764		16,107	16,496	16,827	17,053	17,203
NEW: projected Residential	343		389	331	226	150	150
Commercial	3,852		4,063	4,063	4,063	4,063	4,063
NEW: projected Commercial	211		-	-	-	-	-
Metro Water - Residential	1,353		1,353	1,353	1,353	1,353	1,353
Metro Water - Commercial	1,005		1,005	1,005	1,005	1,005	1,005
Total Units:	22,528		22,917	23,248	23,474	23,624	23,774
Carry forward Fund Balance	$ 299,844		$ 192,953	$ 93,695	$ (13,187)	$ (85,369)	$ (172,723)
Revenue:							
Monthly Stormwater Utility Fee/Unit	$ 2.90		$ 2.90	$ 2.90	$ 2.90	$ 2.90	$ 2.90
Gross Revenues	$ 783,974		$ 797,512	$ 809,030	$ 816,895	$ 822,115	$ 827,335
Funding from Outside Sources	3,250		3,331	3,415	3,500	3,587	3,677
Grant Funds	35,000						
	$ 822,224		$ 800,843	$ 812,445	$ 820,395	$ 825,703	$ 831,012
Expenses:							*3.5%*
Personnel							
3.80 Current Staff							
Total Personnel:	$ 346,620		$ 345,568	$ 357,663	$ 370,181	$ 383,137	$ 396,547
Contracts/Services							
Outside Professional Services*	116,795	a	117,963	119,143	120,334	121,537	122,753
Low Impact Development	35,000						
Other	50,000		50,000	50,000	50,000	50,000	50,000
Stormwater Maintenance	134,000	b	138,690	143,544	148,568	153,768	159,150
Vehicle Repair & Maintenance	19,800	a	19,998	20,198	20,400	20,604	20,810
Equipment Repair & Maintenance	32,000	a	32,320	32,643	32,970	33,299	33,632
Rentals	250	a	253	255	258	260	263
Telecommunications	1,400	a	1,414	1,428	1,442	1,457	1,471
Postage	250	a	253	255	258	260	263
Printing & Binding	1,000	a	1,010	1,020	1,030	1,041	1,051
Travel & Training	5,000	a	5,050	5,101	5,152	5,203	5,255
Membership	7,500	a	7,575	7,651	7,727	7,805	7,883
Office Supplies	2,000	a	2,020	2,040	2,061	2,081	2,102
Gasoline	24,500	a	24,745	24,992	25,242	25,495	25,750
Uniforms	750	a	758	765	773	780	788
Bad Debt Expense	750	a	758	765	773	780	788
Field Supplies	9,000	a	9,090	9,181	9,273	9,365	9,459
Safety	500	a	505	510	515	520	526
Software Maintenance & Licensing	1,500	a	1,515	1,530	1,545	1,561	1,577
SW Projects	50,000		50,000	50,000	50,000	50,000	50,000
Depreciation	135,000		135,000	135,000	135,000	135,000	135,000
Total Contracts/Services:	$ 626,995		$ 598,915	$ 606,021	$ 613,320	$ 620,818	$ 628,520
Capital Outlay/Projects							
Minor Assets	2,500	a	2,525	2,550	2,576	2,602	2,628
Misc - Mos. Trapping	3,407		3,500	3,500	3,500	3,500	3,500
Vehicle/Equipment Reserve	38,000		38,000	38,000	38,000	38,000	38,000
New Vehicles			-	-	-	-	-
Capital Interest	305		305	305	-	-	-
Equipment	46,288		46,288	46,288	-	-	-
Total Capital Outlay	$ 90,500		$ 90,618	$ 90,643	$ 44,076	$ 44,102	$ 44,128
Total Expenses:	$ 1,064,115		$ 1,035,101	$ 1,054,327	$ 1,027,577	$ 1,048,057	$ 1,069,195
Ending Balance/Contingency Reserve	$ 192,953		$ 93,695	$ (13,187)	$ (85,369)	$ (172,723)	$ (275,905)
	24.6%		*11.7%*	*-1.6%*	*-10.5%*	*-21.0%*	*-33.3%*
Vehicles			-	-	-	-	-
Equipment			-	-	-	-	50,000
Vehicle/Equipment Reserve - Replacement	$ 90,806		$ 128,806	$ 166,806	$ 204,806	$ 242,806	$ 230,806

⇨ Assumes Growth in Benefits & Wages **3.5%** [b]

⇨ Internal drainage projects remain the same

⇨ Cost Escalation **1.0%** [a]

Notes:

> **continue to charge out operations support to Hwy Fund per current method**

> ending revenue amounts are estimates subject to further revisions, and may not tie to cash balance in fund due to timing of revenues and expenditures

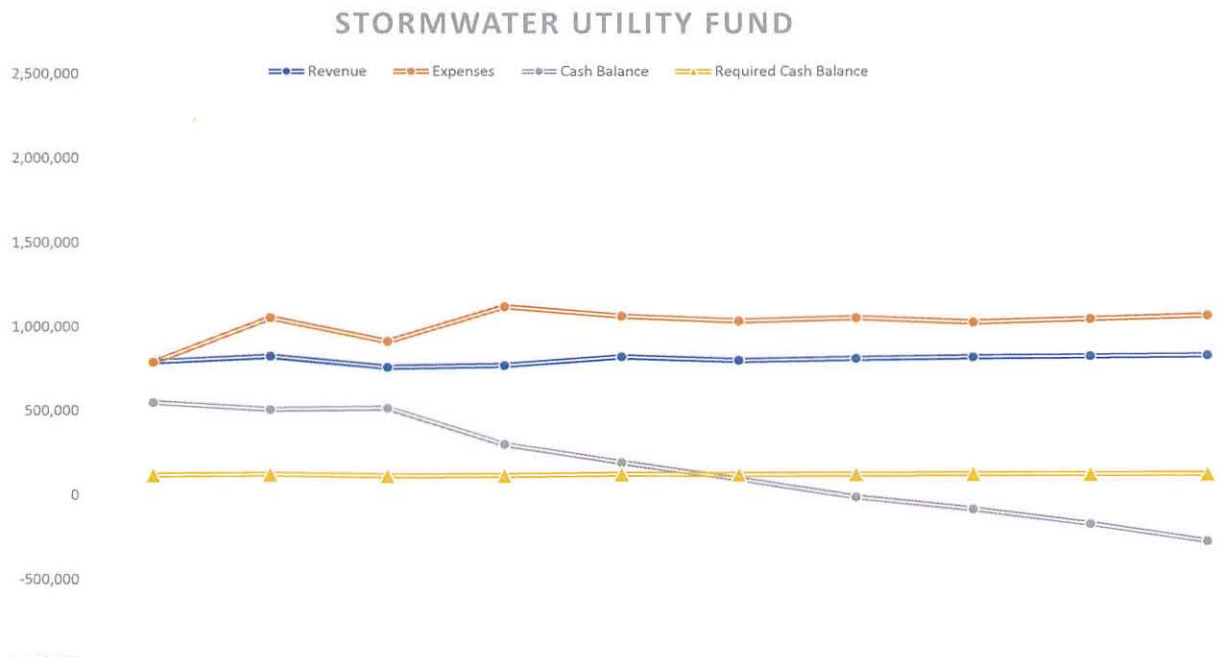
Appendix B – Stormwater Utility Status Quo Funding Charts

Town of Oro Valley

Stormwater Utility Division

CHART 1 - Status Quo Funding Chart

Fiscal Year	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$ 792,987	$ 826,738	$ 760,629	$ 771,888	$ 822,224	$ 800,843	$ 812,445	$ 820,395	$ 825,703	$ 831,012
Expenses	$ 788,247	$ 1,055,761	$ 913,564	$ 1,120,268	$ 1,064,115	$ 1,035,101	$ 1,054,327	$ 1,027,577	$ 1,048,057	$ 1,069,195
Cash Balance	$ 549,974	$ 509,768	$ 516,740	$ 299,844	$ 192,953	$ 93,695	$ (13,187)	$ (85,369)	$ (172,723)	$ (275,905)
Required Cash Balance	$ 118,948	$ 124,011	$ 114,094	$ 115,783	$ 123,334	$ 120,126	$ 121,867	$ 123,059	$ 123,855	$ 124,652



	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$792,987	$826,738	$760,629	$771,888	$822,224	$800,843	$812,445	$820,395	$825,703	$831,012
Expenses	$788,247	$1,055,761	$913,564	$1,120,268	$1,064,115	$1,035,101	$1,054,327	$1,027,577	$1,048,057	$1,069,195
Cash Balance	$549,974	$509,768	$516,740	$299,844	$192,953	$93,695	$(13,187)	$(85,369)	$(172,723)	$(275,905)
Required Cash Balance	$118,948	$124,011	$114,094	$115,783	$123,334	$120,126	$121,867	$123,059	$123,855	$124,652

**FY 2020/21 begin use of vehicle reserve for vehicle and equipment purchases.*

Appendix C – Stormwater Fund Preferred Scenario – 5 Year Forecast

Stormwater Preferred Funding Option - 5-year projection

Revised: 1/11/2016

Monthly Stormwater Utility Fee/Unit	FY 2015/16 Current	FY 2016/17 Change ERU	Notes
Residential Rate	$2.90	$4.50	$1.60 increase
Commercial Rate	$2.90	$4.50	$1.60 increase
ERU = Square Feet	5,000	4,000	*Commercial may apply for credit
# of Units:			Change in ERU requires the Town Code to be modified
Residential	17,460	17,749	
Commercial	5,068	6,335	Change in rate is accomplished through a resolution
Total Units:	22,528	24,084	
Carryforward Fund Balance	$ 299,844	$ 192,953	
Revenue:			- Corrects structural deficient
Gross Revenues	$ 783,974	$ 1,300,536	- Increases maintenance abilities
Funding from Outside Sources	$ 3,250	$ 3,250	Provides staffing to
Grant Funds (one time)	35,000		- Increases reporting / ADEQ BMP's
	$ 822,224	$ 1,303,786	- Develop a CIP program with projects
Additional Revenue		$ 516,562	- Manage and Inspect additional assets
Expenses:			*Return at a later date > if there is support for project implementation*
Personnel			
3.8 Current Staff	$ 346,620	$ 358,752	
New - Proposed			
1.0 Asset Mgr./Engineer	-	69,089	
1.0 Stormwater Prj.-Const. Mgr	-	83,982	
5.8 Total Stormwater Staff	-	153,071	
Total Personnel:	$ 346,620	$ 511,822	
Contracts/Services			**Tasks - Outcomes**
Outside Professional Services*	116,795	118,000	• Project Identification
ONE TIME GRANT	35,000	-	- costing
Design/Consultants	50,000	10,000	- design
Stormwater Maintenance - OPS	134,000	139,000	- build/maint under 80K
Increase Maintenance (Services)		80,000	• Work order development
Vehicle Repair & Maintenance	19,800	21,000	- prioritization / maintenance scheduling
Equipment Repair & Maintenance	32,000	32,000	- increased inspections
Rentals	250	500	- increased Public Education
Telecommunications	1,400	2,800	• New Program Compliance
Postage	250	250	• Personnel/Operations cost
Printing & Binding	1,000	1,000	increase for deliverables
Travel & Training	5,000	10,000	• Program Sustainability
Membership	7,500	7,500	- 5 years
Office Supplies	2,000	6,000	
Gasoline	24,500	27,000	
Uniforms	750	1,500	
Bad Debt Expense	750	750	
Field Supplies	9,000	18,000	
Safety	500	1,000	
Software Maintenance & Licensing	1,500	1,500	
SW Projects	50,000	50,000	
Depreciation	135,000	135,000	
Total Contracts/Services:	$ 626,995	$ 662,800	
Capital Outlay/Projects			
Minor Assets	2,500	3,500	
Misc - Mos. Trapping	3,407	3,500	
Vehicle/Equipment Reserve	38,000	38,000	
New Vehicles	-	35,000	
Capital Interest	305	305	
Equipment	46,288	46,288	
Total Capital Outlay	$ 90,500	$ 126,593	
Total Expenses:	$ 1,064,115	$ 1,301,215	
Ending Balance/Contingency Reserve	$ 192,953	$ 330,524	
	24.6%	*25.4%*	

Note: Program sustainability only accounts for funds to preserve activities defined above. Additional County or other external funds must become available to pay for larger capital projects which will be identified. In the absence of County or other external funds, the rate structure will need to be revised again within one or two years or so that large capital projects identified by the new staff can be completed and funded by the Stormwater Utility.

Five Year Projection	*Year 1* FY 16/17	*Year 2* FY 17/18	*Year 3* FY 18/19	*Year 4* FY 19/20	*Year 5* FY 20/21
Balance	$ 192,953	$ 330,524	$ 321,659	$ 328,160	$ 316,742
Revenue	$ 1,303,786	$ 1,325,867	$ 1,342,006	$ 1,353,831.73	$ 1,365,678
Personnel	$ 511,822	$ 529,736	$ 548,277	$ 567,466	$ 587,328
O&M	$ 523,800	$ 529,038	$ 534,328	$ 539,672	$ 545,068
Ops Main	$ 139,000	$ 143,865	$ 148,900	$ 154,112	$ 159,506
Capital	$ 126,593	$ 132,093	$ 104,000	$ 104,000	$ 119,000
Expenditure	$ 1,301,215	$ 1,334,732	$ 1,335,505	$ 1,365,250	$ 1,410,902
YE Cash Balance	$ 330,524	$ 321,659	$ 328,160	$ 316,742	$ 271,518
Reserve Balance Percent	*25.4%*	*24.3%*	*24.5%*	*23.4%*	*19.9%*
Purchases	$ -	$ -	$ -	$ -	$ 50,000
YE Vehicle/Equipment Cash Balance	**$ 128,806**	**$ 170,306**	**$ 215,306**	**$ 260,306**	**$ 255,306**
Vehicles/Equipment	Truck	Truck			Sweeper *Use Begins

> Accounts for depreciation

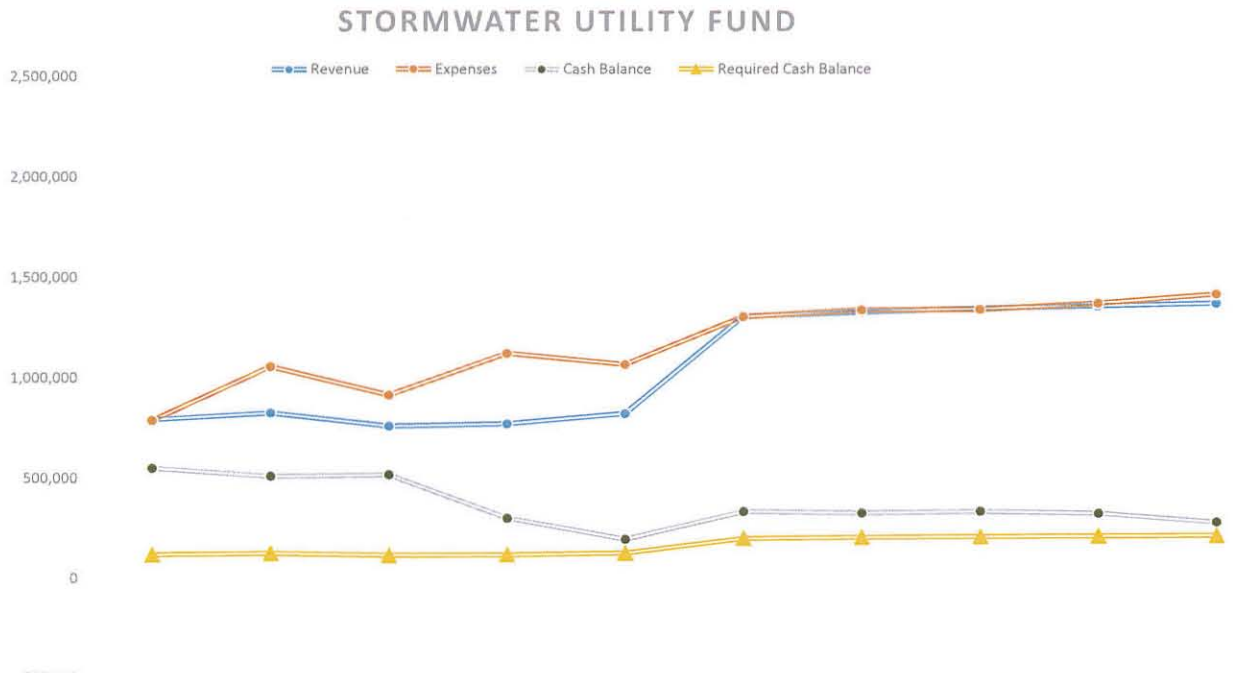
Appendix D – Stormwater Utility Preferred Scenario Funding Chart

Town of Oro Valley

Stormwater Utility Division

CHART 2 - Proposed Rate Adjustment Funding Chart

Fiscal Year	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$ 792,987	$ 826,738	$ 760,629	$ 771,888	$ 822,224	$ 1,303,786	$ 1,325,867	$ 1,342,006	$ 1,353,832	$ 1,365,678
Expenses	$ 788,247	$ 1,055,761	$ 913,564	$ 1,120,268	$ 1,064,115	$ 1,301,215	$ 1,334,732	$ 1,335,505	$ 1,365,250	$ 1,410,902
Cash Balance	$ 549,974	$ 509,768	$ 516,740	$ 299,844	$ 192,953	$ 330,524	$ 321,659	$ 328,160	$ 316,742	$ 271,518
Required Cash Balance	$ 118,948	$ 124,011	$ 114,094	$ 115,783	$ 123,334	$ 195,568	$ 198,880	$ 201,301	$ 203,075	$ 204,852



	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$792,987	$826,738	$760,629	$771,888	$822,224	$1,303,786	$1,325,867	$1,342,006	$1,353,832	$1,365,678
Expenses	$788,247	$1,055,761	$913,564	$1,120,268	$1,064,115	$1,301,215	$1,334,732	$1,335,505	$1,365,250	$1,410,902
Cash Balance	$549,974	$509,768	$516,740	$299,844	$192,953	$330,524	$321,659	$328,160	$316,742	$271,518
Required Cash Balance	$118,948	$124,011	$114,094	$115,783	$123,334	$195,568	$198,880	$201,301	$203,075	$204,852

**FY 2020/21 begin use of vehicle reserve for vehicle and equipment purchases. New rate adjustment accounts for depreciation.*

Appendix E – Stormwater Listing

The list of issues on the following pages is a compilation of drainage and Stormwater deficiencies that need to be evaluated, designed, programed or facilitated. Some of these issues have been on a list since 2001 while other deficiencies have been added as new washes and new assets have been identified and inventoried. This list is fluid and as additional issues are brought to our attention concerns, complaints or evaluation requests are made from the community the list is modified.

Issues have been categorized as;

- Restoration
- Maintenance
- Study
- Design/Construction

At this time none of these issues have not been assessed nor is there funding for any type of evaluation or mitigation. The ability to evaluate these issues will provide Once evaluated, the Town of Oro Valley will have a platform for requesting funding or competing for funding from outside sources to address some of these issues. THIS LIST IS NOT PRIORITIZED IN ANY ORDER NOR DOES IT INDICATE THAT THE TOWN IS RESPONSIBLE FOR EVALUATING OR MITIGATING THE ISSUES. PRIVATE WASHES DO NOT FALL UNDER THE STORMWATER UTILITY PURVIEW.

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Town of Oro Valley
Stormwater Projects

The following Stormwater Maintenance Projects are categorized by:

(S) · Maintenance Recurring - Sediment Removal & Cleaning (maybe storm related)
(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-1	401 E Strada Patania	Tangerine Hills		Install flared end and reconnect end of culvert, rip rap	Drainage Designs and Repairs - Construction	One Time - CIP	1	**FY 2015**	$ 7,500	Pima County
S-1	Canyon Shadow Wash	Canada Hills Parcel K	OV	Remove sediment in ROW north of Lambert - excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2	annual	$ 5,000	Oro Valley - unfunded
DC-2	Canyon Shadow Wash (Lambert to CDO)	Rancho Feliz (442-647)	OV	Soil cement wash bottom deteriorating at multiple locations with large erosion: also Repair concrete inlet wing wall on north side of Lambert	Drainage Designs and Repairs - Construction	Recurring +4 yrs	2	**FY 2014**	$ 10,000	1st Year completed - inspection in 2018
V-1	Canada Hills Parcel K	Canada Hills Parcel K	OV	Remove vegetation/debris in Canyon Shadows wash, ROW north of Lambert	Vegetation Removal - Maintenance	Recurring - OP	2	annual	$ 2,000	Oro Valley - unfunded
M-1	**Carmack Wash Basin**	**Pima County is performing the study**	OV	This basin that is comprised of numerous tributaries that have a 100 year flow of over 3,000 cfs as they leave the town boundaries. These tributaries are causing erosion, sedimentation, and flooding problems at numerous areas throughout the subdivisions they traverse	**Management Study**	One Time - CIP	1	In Progress	$ 100,000	Pima County should be completing this study
S-2	Carmack Wash			Remove debris in ditches Linda Vista from Oracle to Box culverts excessive sediment.	Sediment Removal - Maintenance	Recurring - OP	2	annual	$ 7,000	Oro Valley - unfunded
DC-3	Carmack Wash			Design drainage flow for Linda Vista, Oracle to Box culverts, new design to have concrete bottom for cleaning and sides armored for erosion control	Drainage Designs and Repairs - Construction	One Time - CIP	1	FY	$ 30,000	Oro Valley - unfunded
DC-4	Highlands Wash		PRI	Design repair from Con Arches to CDO, need 404 and easements to control erosion - Demo approx 1/2 of existing outlet south of Lambert Lane and build to correct outlet flow	Drainage Designs and Repairs - Construction	One Time - CIP	1	FY	$ 600,000	Private - unfunded
DC-5	Unknown Wash		PRI	Concrete wash repair behind Fry's off of La Canada	Drainage Designs and Repairs - Construction	One Time - CIP	2	FY	$ 80,000	Private - unfunded
S-3	Highlands Wash		PRI	Remove debris in channel upstream and down stream and clean con arches excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2		$ 30,000	Private - unfunded
DC-6	Lambert Lane		OV	Install short extension and flared Ends to all 4 culverts under Lambert Lane, East of La Cholla, place rip rap	Drainage Designs and Repairs - Construction	One Time - CIP	1	**FY 2015**	$ 25,000	Oro Valley - unfunded
DC-7	Lambert Lane (Casas)		OV	An unnamed wash crosses Lambert road at a dip crossing that causes significant flooding and sediment buildup at less than a 2 year storm event. In addition road edge erosion is affecting the structural integrity of the road. A box culvert project would alleviate this problem and provide all weather crossing.	Drainage Designs and Repairs - Construction	One Time - CIP	1		$ 600,000	Oro Valley - unfunded. PCFCD possible

Town of Oro Valley
Stormwater Projects

The following Stormwater Maintenance Projects are categorized by:

(S) · Maintenance Recurring - Sediment Removal & Cleaning (maybe storm related)
(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-8	Moore Road Box Culverts		OV	Moore road currently has 3 dip crossings that become a hazard annually during the monsoon season and must be closed at a 5 year event. The road is a safety concern during and after every rain event. This project will construct grade control structures and enhance the road structure with ribbon curbs to improve the safety and reduce maintenance during rain events.	Drainage Designs and Repairs - Construction	One Time - CIP			$ 800,000	Oro Valley - unfunded. PCFCD possible
DC-56	Saddle Valley/Logan's Crossing	Saddle Valley/Logan's Crossing	PRI	Clean Culverts at Preakness/ Review Maintenance to Gabion baskets in dipsection adjacent to Water Tank	HOA has drainage issues with in the subdivision which need to be re-engineered by them - Cost TBD	OneTime		annual	$ 4,000	Oro Valley - unfunded
DC-9	Mutterer's Wash	Oro Valley Townhomes	OV	Evaluate and redesign wash to improve water flow while designing walking path along side wash.	Drainage Designs and Repairs - Construction	One Time - CIP			TBD	Oro Valley - unfunded
V-2	Mutterer's Wash	Oro Valley Townhomes	OV	Remove vegetation/debris in wash	Vegetation Removal - Maintenance	Recurring - +4 yrs	1	**FY 2015**	$ 2,800	1st Year completed - inspection in 2018
DC-10	Naranja Park Town Site		OV	Add Rip Rap/Filter Fabric to south slope of Ball fields @ 560'x 70' = 39,200 sq.ft. Find Alternative to Stabilize Slopes	Drainage Designs and Repairs - Construction	One Time - CIP	2			Oro Valley - unfunded
DC-89	**Naranja Park Town Site**		OV	Design and build drainage structures to reduces deterioration of "slope/berm" along Monterra Hills road impacting sidewalks.	Drainage Designs and Repairs - Construction	One Time - CIP	1		$ 100,000	Oro Valley - unfunded
DC-11	Naranja Road @ Sawtooth		OV	Shot create repair along hill side east of Sawtooth within ROW	Drainage Designs and Repairs - Construction	One Time - CIP	2		$ 40,000	Oro Valley - unfunded
DC-12	Naranja Drainage Improvements	Ironwood High School	OV	New culverts at existing dip crossing to allow all weather access during hazardous rain events. The all weather crossings will provide access to Ironwood High School which is designated as an emergency management contact location during local emergencies. The improvements include nine 24" RCP, a 6 cell 4'X10' culvert.	Drainage Designs and Repairs - Construction	One Time - CIP			$ 1,700,000	Oro Valley - unfunded. PCFCD possible
DC-13	Northern Avenue Drainage Improvements		OV	Comprehensive Drainage study and Construction of Culverts for all low water crossings on Northern.	Drainage Designs and Repairs - Construction	One Time - CIP	2		$ 2,500,000	Oro Valley - unfunded
M-2	**Peglar Wash Basin**		OV	This project involves studying the Peglar Wash Basin (North of Magee Road between Northern Ave. & Oracle Road) within the Town of Oro Valley that is composed of numerous tributaries that have a 100 year flow of over 1,500 cfs as they leave the town boundaries.	**Management Study**	One Time - CIP	2		$ 75,000	Oro Valley - unfunded
DC-14	Peglar Wash Basin		OV	This project is to implement the recommendations from the Peglar's Wash Basin Mgt Study. This area primarily deals with waters that travel through the Suffolk Hill's portions of the Town.	Drainage Designs and Repairs - Construction	One Time - CIP	2		TBD	Oro Valley - unfunded
V-3	Rooney Wash		OV	Complete yearly landscape work Rooney Wash	Vegetation Removal - Maintenance	Recurring - OP	2	annual	$ 60,000	Oro Valley - unfunded
S-4	Shadow Mountain Estates West	Shadow Mountain Estates West	OV	Remove sediment in drainage easement behind homes excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2	FY 2015	$ 7,500	Due to storm impact - PC outsoruced work

Town of Oro Valley
Stormwater Projects

The following Stormwater Maintenance Projects are categorized by:

(S) · Maintenance Recurring - Sediment Removal & Cleaning (maybe storm related)
(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-15	Shadow Mountain Estates West	Shadow Mountain Estates West	OV	Design and repair alley drainage - erosion to area of exposed gas lines	Drainage Designs and Repairs - Construction	One Time - CIP	2		$ 20,000	Oro Valley - unfunded
V-4	Shadow Mountain Estates West	Shadow Mountain Estates West	OV	Shadow Mountain Estates vegetation removal in alley drainage ways	Vegetation Removal - Maintenance	Recurring - OP	2	FY 2015	$ 89,000	Due to storm impact - PC outsoruced work
M-3	**Un-named (Shannon) Basin**		OV	This project requires studying the area from Shannon road to Thornydale Road, from Tangerine Road to Naranja Road that would be used for future Town Development/incorporation. This is roughly 640 acres that is composed of numerous tributaries.	**Management Study**	One Time - CIP	2		$ 100,000	Oro Valley - unfunded. PCFCD possible
S-5	Vista Del Oro Estates	Vista Del Oro Estates		Remove sediment Vista del Oro Estates excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2		$ 7,500	Oro Valley - unfunded
V-5	Vista Del Oro Estates	Vista Del Oro Estates		Landscape in Vista Del Oro Estates Wash	Vegetation Removal - Maintenance	Recurring - OP	2		$ 5,000	Oro Valley - unfunded
M-4	**Un-named Basin**			This project requires studying the drainage areas that hold future annexation potential for the Town of Oro Valley. The study area would extend (south and west) from existing Town limits to the boundaries of Orange Grove (to the south) & Thornydale (to the west).	**Management Study**	One Time - CIP	1		TBD	Oro Valley - unfunded. PCFCD possible
STORM RELATED SMALL PROJECTS										
C-1	Newport Drive			Concrete drainage channel repair	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
C-2	Valle Del Oro	Oro Valley Estates		Concrete drainage channel repair	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
C-3	Atua	Oro Valley Estates		Drop inlet add riprap repair erosion	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
C-4	Lambert Lane-Rancho Sonora			Reconstruct drop inlet	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
SR-1	9130 N Shadow Mnt			Berm construction - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-2	10865 N. 1st Ave			Erosion control and stabilization - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-3	901 W. Valle De Oro	Oro Valley Estates		Erosion Control - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-4	321 W. Golf View			Erosion repair, rip rap shoulder - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded

Town of Oro Valley
Stormwater Projects

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(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
SR-5	180 E Catalina Shadows			Berm construction to protect driveway - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-6	14255 N. Ave			Erosion mail box and ponding driveway - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-7	8980 N. Camino de Anza			Erosion at mail box - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-8	422 W. Hardy			Repair berm - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-9	255 E. Newport			Erosion edge of pavement - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
STORM RELATED ROAD CLOSURE - SAFETY										
DC-15	Buena Vista north of Spring Valley Dr.			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-16	Buena Vista south of Calle Concordia			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-17	Calle Concordia near Buena Vista			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-18	Calle Loma Linda @ Calle Bonita			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-19	Calle Solano wash area			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-20	CDO south of Riverfront Park			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-21	Hardy Road, wash west of the roundabout.			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-22	Highlands Mobile Park			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-23	La Cholla North of Glover			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-24	La Cholla South of Casas Entrance			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded

Town of Oro Valley
Stormwater Projects

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(V) · Vegetation Removal. Recently Completed (M) · Management Studies

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-25	La Cholla South of Lambert			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-26	La Cholla South of Naranja			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-27	Lambert east of La Cholla			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-28	Lambert Lane west of La Cholla			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-29	Landoran Ln	Oro Valley Estates		sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-30	Limewood East of Camino Del Plata	Limewood		sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-31	Linda Vista near Egleston	Vista Montana		sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-32	Lomas De Oro at Lambert			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-33	Moore East of La Cholla			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-34	Moore east of La Cholla			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-35	Naranja @ Ironwood Ridge HS			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-36	Naranja East of Shannon			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-37	Naranja West of La Cholla near HS			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-38	Northern Ave behind Walmart			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-39	Northern Ave north of Cool			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded

Town of Oro Valley
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Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) · Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-40	Northern Ave south of camino cortaro			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-41	Northern Ave south of Magee			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-42	Overlook south of Calle Concordia			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-43	Pistachio @ culverts			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-44	Pistachio @ Pomegranate			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-45	Rancho Sonora Dr			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-46	Shannon South of Naranja			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-47	Shannon to stop traffic from crossing the wash at the north end.			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-48	Suffolk Dr @ Village			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-49	Tangerine - by Camino Del Plata	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-50	Tangerine - one at town boundary	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-51	Tangerine @ Camino Del Plata	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-52	Tangerine and area between La Cholla and La Canada.	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-53	Tangerine West of La Cholla	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-54	Valle Del Oro RD			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded

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(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-55	Valle Del Oro Rd at CC			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-56	La Cholla @ Tangerine	La Cholla		Sediment removal from drop inlet culvert	Add Berm and waddles to slow and control/direct flow into the inlet		1	annual	$ 1,500	Oro Valley - unfunded
DC-58	8151 Northern Ave.	Northern Ave.		Debris removal from outlet	Storm Drain under Northern blocked by Veg/debris/Sediment at outlet		1	annual	$ 500	Oro Valley - unfunded
DC-60	8252 N Northern Ave.	Northern Ave.		Debris removal from inlets	Storm Drain under Northern blocked by Veg/debris/Sediment at inlet		1	annual	$ 1,500	Oro Valley - unfunded
DC-61	Casas Lindas Apts	Northern Ave.		Debris removal from inlet in ROW	Northern blocked by Veg/debris/Sediment at inlet		1	annual	$ 1,500	Oro Valley - unfunded
DC-62	2005 W Glover Rd	Ironwood Ranch		Debris/Veg /Sediment Removal from outlet of box culvert and manage downstream veg			1	annual	$ 2,500	Oro Valley - unfunded
DC-63	Bridge on Monterra Vista Dr.	Monterra Knolls		Debris/Veg /Sediment Removal from outlet of box culvert and manage downstream veg	Possible Detention Project - Engineer/Design		1	annual	$ 3,000	Oro Valley - unfunded
DC-67	Naranja Dr.	Canada Ridge		Box Culvert in ROW west of Eagle Crest Dr. - inlet /outlet need debris/veg removal			1	annual	$ 2,000	Oro Valley - unfunded
DC-69	605 E Windy Peak	Rancho Catalina		Drainage improvements	Discuss Easement behind lots from 625 E Windy Peak Dr - 8530 N Ranch Catalina with possible detention project. Al Coons		1		$ 10,000	Oro Valley - unfunded
DC-71	363 E Sunburst - Paul Parisi	Rancho Catalina		Veg removal and Channelization of wash running across Rancho Catalina Ave between 455 E Windy Vista Pl. and 8405 N Rancho Catalina Dr.			1		$ 7,500	Oro Valley - unfunded
DC-73	Oracle Square @ Hardy	Shadow Mountain Estates		Drainage improvements	Drainage Study - 900 cfs Coming across Oracle thru box culvert into Shadow Mountain Estates		1		$ 10,000	Oro Valley - unfunded
DC-76	Oracle Rd. Drainage N' of Calle Concordia	Vista Mantana		Drainage improvements - channelization of sheetflow onto Egleston contributing to flooding in Vista Mantana Subdivision	Drainage Study/Temporary Solutions		1		$ 30,000	Oro Valley - unfunded
DC-79	Rock Ridge Apts	Pusch View Lane		Drainage channell on S' side of Pusch View Lane Needs Veg cleanup/debris removal	ROW		1	annual	$ 1,500	Oro Valley - unfunded
DC-81	Rivers Edge S'	Rivers Edge (1-89)	PRI	Drainage Channel outlet to CDO needs Veg Mgmt	Private		1		Private	Private - unfunded
DC-83	Rivers Edge N'	Rivers Edge (103-120)		Box Culvert crossing Lambert needs sediment removed			1	annual	$ 4,500	Oro Valley - unfunded

Town of Oro Valley
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(V) · Vegetation Removal. Recently Completed (M) · Management Studies

No.	Location/Name	Subdivision	Owner	Description of Work	Cost Type	Priority	Year	Estimated Cost	Funding
DC-84	Vista Catalina	Vista Catalina		Channel N' of Vista Catalina/S' of Highlands Mobile Park requires veg/debris/sediment removal		1	TBD	$ 10,000	Oro Valley - unfunded
DC-57	8305 Northern Ave.	Northern Ave.		Debris removal from outlet/Cannot find inlet	Storm Drain under Northern blocked by Veg/debris/Sediment at outlet	2	annual	$ 500	Oro Valley - unfunded
DC-59	8090/8041 Northern Ave.	Northern Ave.		Debris removal from inlets/outlets	Storm Drain under Northern blocked by Veg/debris/Sediment at outlet	2	annual	$ 1,500	Oro Valley - unfunded
DC-65	Ironwood Valley Dr.	Tangerine Heights		Box Culvert - manage erosion cutting from road down sides of box culvert	need to engineer permanent solution	2	annual	$ 500	Oro Valley - unfunded
DC-68	Naranja Dr.	Canada Ridge		Box Culvert in ROW east of Canada Ridge Dr. - outlet need debris/veg removal		2	annual	$ 1,500	Oro Valley - unfunded
DC-70	8620 N Glenhurst Pl.	Sunnyslope		Drainage improvements	Changes in Federal land to the east - altering flows to the west	2		TBD	Oro Valley - unfunded
DC-75	Oracle Rd. Drainage N' of Calle Concordia	OV Aquatic Center		Drainage improvements	Drainage Study	2		$ 3,000	Oro Valley - unfunded
DC-80	Rooney Wash	Oracle Road E' side		Drainage channel on E' side of Oracle Rd. Needs Veg cleanup/debris removal at inlet	ROW /ADOT?	2	annual	$ 1,500	Oro Valley - unfunded
DC-85	10707 N Pomegranite Dr.	Monte Del Oro		Drainage requires refinement		2		$ 1,000	Oro Valley - unfunded
DC-64	Tangerine Road @ Highlands Wash (east of Monterra Knolls)	Monterra Knolls		Debris/Veg /Sediment Removal from inlet/outlet of box culvert and manage downstream veg		3	annual	$ 5,000	Oro Valley - unfunded
DC-66	Reflection Ridge Dr	Tangerine Heights		ROW erosion at entry from Tangerine and north along W'side ROW	Contact Water to discuss erosion around box	3		$ 500	Oro Valley - unfunded
DC-72	Campo Bello	Campo Bello		Drainage improvements	Drainage Study	3		TBD	Oro Valley - unfunded
DC-74	Oracle Rd. Drainage S' of Calle Concordia	Shadow Mountain Estates		Drainage improvements	Drainage Study	3		$ 1,500	Oro Valley - unfunded
DC-77	Oracle Rd. Drainage N' of El Conquistador Way	Mutterers Wash S'		Drainage from Wolfley/Ajacent Property adding to sediment Problem into Mutterers. Deep Erosion cuts next to spillway on El Conquistador Way (Private Property)	Discuss with property owners need for erosion control	3		TBD	Oro Valley - unfunded
DC-78	Valle Del Oro Town Homes	Mutterers Wash S'		Drainage Channell exiting Valle Del Oro townhomes needs to be cleaned...Veg/Debris/Sedimet	Discuss with property owners need for erosion control	3		Private	Oro Valley - unfunded
DC-82	Rivers Edge N'	Pusch Ridge Vistas II		Hillside at 10831 N Pusch Ridge View Pl. Needs Erosion Control	Pusch Ridge Vistas II HOA	3		Private	Oro Valley - unfunded

Town of Oro Valley
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(V) - Vegetation Removal.
Recently Completed
(DC) - Drainage Design and Repair - Construction
(M) - Management Studies
(PR) - Private

No.	Location/Name	Subdivision	Owner	Description of Work	Cost Type	Priority	Year	Estimated Cost	Funding
DC-86	1001 E Linda Vista Blvd	Pusch Ridge Estates		Sweep Road in front of house		3		$ 150	Oro Valley - unfunded
DC-87	Rancho Sonora Dr	Rancho Sonora		Trash in Wash up against barracades		3		$ 150	Oro Valley - unfunded
DC-88	Shadows of the Ridge	Shadows of the Ridge		Sediment removal from drop inlet culvert				$ 2,500	Oro Valley - unfunded

Appendix F – Western Kentucky University

Western Kentucky University
Stormwater Utility Survey
2014

What other are doing.
Summary

Cities, Towns, Counties		Average Fee	Lowest Fee	Highest Fee
Total US Stormwater Utilities	1511	$ 4.01	$ -	$ 35.00

Fee Range	No.			
No Fee	264	17.5%		
.01 to 1.49	96	6.4%		
1.50 to 2.49	137	9.1%		
2.50 to 2.99	160	10.6%	43.5%	Town of Oro Valley
3.00 to 3.49	81	5.4%		
3.50 to 3.99	99	6.6%		
4.00 to 4.99	206	13.6%		
5.00 to 5.99	136	9.0%	34.5%	
6.00 to 6.99	97	6.4%		
7.00 to 7.99	79	5.2%		
8.00 to 8.99	46	3.0%		
9.00 to 9.99	29	1.9%	16.6%	
10.00 to 14.99	61	4.0%		
15.00 to 35.00	20	1.3%	5.4%	
	1511	100.0%	100.0%	

Possible Rates - Residetial

Rates		FY 15/16		Increase Funds
$ 2.90	$ 783,974			
$ 3.63	$ 981,320	25.0%		
$ 4.35	$ 1,175,962	50.0%	$ 391,988	
$ 5.80	$ 1,567,949	100.0%	$ 783,975	
$ 7.25	$ 1,959,936	150.0%	$ 1,175,962	

Population				Average	High	
≤ 10,000	477	31.6%		$ 3.71	$ 19.43	
≤ 25,000	388	25.7%		$ 4.15	$ 14.00	
≤ 50,000	256	16.9%		$ 4.26	$ 14.46	Town of Oro Valley
≤ 75,000	105	6.9%	81.1%	$ 3.93	$ 11.99	
≤ 100,000	67	4.4%		$ 3.71	$ 13.05	
≤ 150,000	58	3.8%		$ 3.94	$ 14.26	
≤ 250,000	59	3.9%		$ 4.31	$ 14.00	
≤ 500,000	52	3.4%	15.6%	$ 4.01	$ 13.78	
≤ 1,000,000	34	2.3%		$ 4.34	$ 16.75	
> 1,000,000	15	1.0%	3.2%	$ 2.72	$ 13.48	
	1511	100.0%	100.0%			

ERU Classifications				
< 1000	18	1.2%		
< 1250	26	1.7%		
< 2000	64	4.2%		
< 2500	112	7.4%	14.6%	
< 2600	69	4.6%		
< 2750	68	4.5%		
< 3000	82	5.4%		
< 3250	125	8.3%	22.8%	
< 4000	122	8.1%		
< 5000	52	3.4%	11.5%	
5000 ≥ 9000	26	1.7%		Town of Oro Valley
9001 ≥ 25000	10	0.7%		
> 43500	35	2.3%		
Unspecified	702	46.5%	51.2%	
	1511	100.0%	100.0%	

Appendix G – Equivalent Residential Unit Study

Development and Infrastructure Services Department
Operations - Stormwater Utility

September 2, 2015

Re: Determining the basic ERU value

This memo describes the steps taken to date in the determination of an Equivalent Residential Unit (ERU) which will be applied to the determination of a revised Stormwater Utility fee structure. The use of available GIS data files in the determination of a revised ERU are discussed. Two GIS data files were used in the process, the first of which is a residential structure footprints file. The footprints file is a GIS data layer with file name [sde.SDE.Residentialfootprint] (footprints) which is located in the Town GIS repository. This file was generated by the Pima Association of Governments (PAG) using existing aerial photograph raster data. The footprint data is in the form of polygons which show the approximate footprint of nearly all the residential and some commercial structures in the Town. Any missing residential data would mostly be structures that did not exist at the time the data was prepared. The footprint data is intended to loosely represent the impervious areas within residential parcels. While the data contains essentially a complete set of all the residential structures, the actual impervious areas of each parcel are larger than what is indicated by the areas measured for the footprints file since the footprints file does not always include pavement areas, outside concrete areas etc... within each residential parcel. The data does, however, provide a consistent and complete source of information to use for our purposes. The second GIS data file used in this process represents the zoning in the Town with file name [sde.SDE.Zoning]. This data is also in the form of polygons with each polygon representing the specific zoning within its area.

Statistics for each zoning category were extracted by first overlaying the footprints file with the zoning file therefore isolating footprint sizes for each zoning district. The critical statistics were: 1) number of footprints within a particular zoning district and 2) the mean size of the footprints in that district. Footprint data for twelve zoning categories were observed (see Table 1). Please see the attached (Figure 1) for a distribution of Oro Valley zoning overlaid on the residential footprints within the Town.

Table 1. Oro Valley Zoning Districts with Selected Statistics

Zoning Category	Description	Count	Mean Footprint Size (sq-ft)
PAD	Planned Area Development	10,977	2752
R-4	Townhouse Residential	2,048	2461
R-6	Multi-Family Residential	198	1949
R1-300	Single Family Residential 0.15 RAC	99	5292
R1-144	Single Family Residential 0.30 RAC	416	3826
R1-43	Single Family Residential 1.00 RAC	449	3808
R1-36	Single Family Residential 1.20 RAC	1,563	3494
R1-20	Single Family Residential 2.00 RAC	350	4400
R1-7	Single Family Residential 5.00 RAC	645	3183
SDH-6	Site Delivered Housing District	281	1861
T-P	Technology Park	84	2181
C-1	Commercial	31	26,103

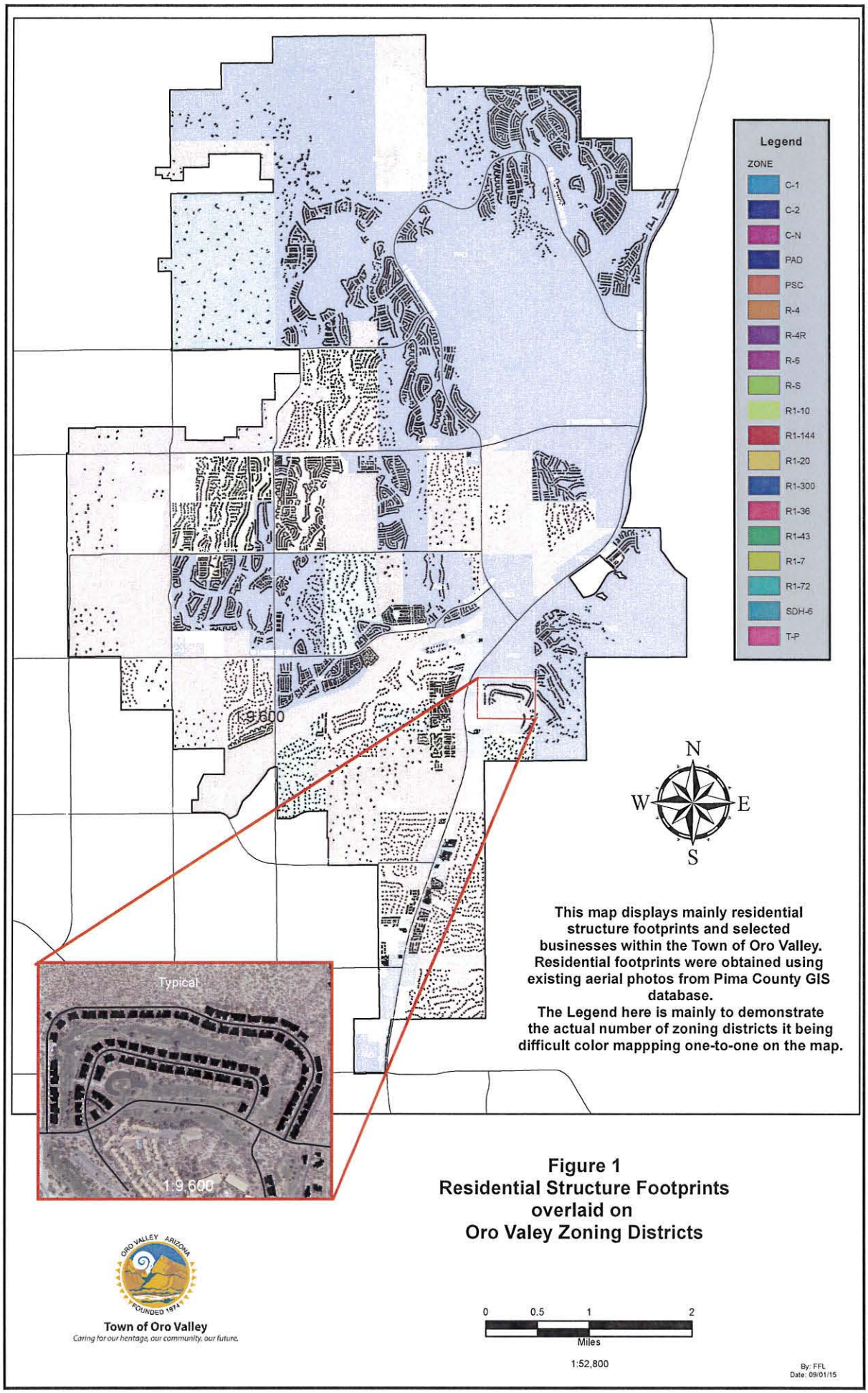
Note: The above data does not represent a complete list of all zoning districts and the Count values may be slightly higher for the districts that are shown. This calculation is a "first pass" intended to get a reasonable approximation of the statistics.

From the data identified in Table 1 all statistics for single family residential were used in the determination of an ERU value. Single family residential was used since it comprised the majority of the overall residential structures within the Town and it is typically used in the available literature when using ERU as a method of calculating stormwater fees. The ERU was calculated as the Count weighted average of the mean footprint sizes. The formula for calculating the ERU was as follows:

$$\frac{(\text{Mean Footprint Size}_{R1\text{-}300} \times \text{Count}_{R1\text{-}300}) + (\text{Mean Footprint Size}_{R1\text{-}144} \times \text{Count}_{R1\text{-}144}) + \ldots}{(\text{Count}_{R1\text{-}300} + \text{Count}_{R1\text{-}144} + \ldots)}$$

The result for this calculation is 3701.218 indicating a rounded ERU value of 3700. The current ERU for the Town is 5000. This method provides a consistent and measurable way to calculate the basic ERU.

Prepared by:
Fritz F. Laos, EIT, CFM
Civil Engineer
Town of Oro Valley Stormwater Utility



This map displays mainly residential structure footprints and selected businesses within the Town of Oro Valley. Residential footprints were obtained using existing aerial photos from Pima County GIS database.
The Legend here is mainly to demonstrate the actual number of zoning districts it being difficult color mappping one-to-one on the map.

Figure 1
Residential Structure Footprints overlaid on Oro Valey Zoning Districts

Town of Oro Valley
Caring for our heritage, our community, our future.

Document Path: F:\2 DIV OPERATIONS\STORMWATER\FRITZ'S DIRECTORIES\FFL Regional Floodplain\Maps\Imprvs_srfcs\Imprvs_srfcs.mxd

Bibliography

Campbell, C. Warren (2011). Western Kentucky University 2011 Stormwater Utility Survey, Western Kentucky University, Bowling Green, 51 pp.

PUBLIC NOTICE
RESOLUTION NO. (R)16-12
A RESOLUTION OF THE MAYOR AND COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA, PROVIDING NOTICE OF INTENT TO INCREASE THE STORMWATER UTILITY BASE RATE
WHEREAS, pursuant to A.R.S. 9-511, et seq., the Town has the requisite statutory authority to acquire, own and maintain a stormwater utility for the benefit of the landowners within and without the Town's corporate boundaries; and
WHEREAS, pursuant to A.R.S. § 9-511, et seq., the Town is required to give a Notice of Intent at a regular Town Council meeting to increase Stormwater rates, fees and charges; and
WHEREAS, on November 7, 2007, the Council adopted Resolution No. (R) 07-127, establishing the base rate for the Stormwater Utility fee; and
WHEREAS, the Town has completed a Stormwater Rates Analysis Report, attached hereto as Exhibit "A", which supports increasing the base rate for the Oro Valley Stormwater Utility; and
WHEREAS, not less than twenty (20) days prior to the public hearing on the proposed rate increases, the Town shall cause to be published one time in a newspaper of general circulation within the Town's boundaries, a Notice of Intent showing the date, time and place of the hearing.
NOW THEREFORE, BE IT RESOLVED, BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA:
1. This Resolution serves as the Notice of Intent, which is hereby publicly given, for the Town of Oro Valley to increase the base rate of the Oro Valley Stormwater Utility.
2. A public hearing shall be held at the regular meeting of the Mayor and Council at 6:00 p.m. on May 4, 2016, in the Council Chambers of the Town Hall, Town of Oro Valley, 11000 North La Cañada Drive, Oro Valley, Arizona, to deliberate and vote on the proposed increases.
3. Exhibit "A", attached hereto, be made available to the public in the Office of the Town Clerk and on the Town of Oro Valley Stormwater Utility website for review prior to the public hearing.
PASSED AND ADOPTED by the Mayor and Town Council of the Town of Oro Valley, Arizona this 2nd day of March, 2016.
TOWN OF ORO VALLEY Dr. Satish I. Hiremath, Mayor ATTEST: APPROVED AS TO FORM: Julie K. Bower, Town Clerk Tobin Sidles, Legal Services Director
*Exhibit "A" on file in the Town Clerk's Office
PUBLISH: The Daily Territorial
Mar. 7, 2016

Ramsey, Aimee

From:	Bob [redacted]
Sent:	Saturday, April 16, 2016 4:53 PM
To:	Storm Water OV
Subject:	storm water utility

Hi.
Got my statement today for my quarterly fee (1/1/16-4/1/16) for $8.70 due by 5/4/16. No problem there.

The reason I am emailing is because of the little blue note included with my bill. There are 2 reasons.

(1) Went to the website to view the "stormwater rates analysis report" at www.orovalleyaz.gov. Tried 3 different browsers and they all would not let me view that page because "The owner of www.orovalleyaz.gov has configured their website improperly." The error message goes on to say that it is an insecure connection and my personal information can be stolen. What's up with that?! (even though I type "http://www.orovalleyaz.gov" it gets changed to "https://www.orovalleyaz.gov" which is further confusing. Why is this site secured?)

(2) The blue note talks about a base rate increase from $2.90 per month to $4.50. Duh! This is over 55%! Wanna guess how much my social security has gone up in the past seven years? Don't guess, here's the answer:

January 2010 -- 0.0%
January 2011 -- 0.0%
January 2012 -- 3.6%
January 2013 -- 1.7%
January 2014 -- 1.5%
January 2015 -- 1.7%
January 2016 -- 0.0%

Three years - none! Three years less than 2%! One year less than 4%. That's a total of 8.5% over the last 7 years! And you're proposing 55%! Having been an OV resident for over 26 years, I think this is way outa line and needs to be re-reviewed. Of course, I haven't viewed the "analysis" since it's "hidden from view", but I still think this is a proposed "crime", especially considering that this is supposed to address "impact and cleanup of storm water runoff during and after rainfall events"* and we've been in a drought situation for the past 7 years! (meaning very little runoff to be taken care of) and does not address abatement construction (which should be taken from other taxes/fees).

Maybe I'll learn a little more after reviewing your "secret" document. I'm sorry I won't be able to attend your May 4th Public Hearing, but I wouldn't want to come with no details on this proposal, anyway.

Bob Owin
[redacted]

* taken from letter of March 13, 2008 from David B Parker to Tucson Water/Metro Water Customer

Ramsey, Aimee

From: CenturyLink Customer[redacted]
Sent: Tuesday, April 19, 2016 2:44 PM
To: Storm Water OV
Subject: Stormwater Utility rate increase

Follow Up Flag: Follow up
Flag Status: Flagged

To Whom it May Concern:

As a long time resident of Oro Valley (26 years), and a member of the nearby community since 1964, I am totally opposed to an increase in the Stormwater Utility rate of a whopping 55 percent. For those of us who live on a fixed income, this is an outrage. Nonetheless, I suspect when it comes to the Mayor and his cronies, any increase in taxes to the residents of Oro Valley is irrelevant, and they will do whatever they want regardless of what the people have to say.

Richard Gosla

Ramsey, Aimee

From:	[redacted]
Sent:	Tuesday, April 19, 2016 3:11 PM
To:	Storm Water OV
Subject:	Base Rate Increase for Residential Properties.
Follow Up Flag:	Follow up
Flag Status:	Flagged

To whom this may concern,

Upon receiving my latest Storm water bill from you folks, I notice the flyer which had been place in with the bill. This flyer notes that a rate increase on the Equivalent Residential Unit (ERU) from $2.90 to $4.50 which is about 64% increase from the current charge rate is being discuss at a Thursday (4/12) storm water utility commission meeting and then at a public meeting on Wednesday (5/4/16). I guess I'm dumb founded by this rate hike, because even with the $2.90 to ERU and a total of $8.70 I paid upon receipt I don't see results of these monies being used. I have been in Oro Valley since 1976, we have gone from a village I believe in 1976 to a town/city currently. So I'm asking given that you the council will see no problem with raising these rates, what is exactly these monies going to do for the current and future of Oro Valley?

Sincerely
Richard A. Yurmanovich

Ramsey, Aimee

From: [redacted] on behalf of Keith Donegan

Sent: Thursday, April 21, 2016 8:21 AM
To: Storm Water OV
Subject: Utility Rate Comment

As a resident and home owner of Oro Valley since the annex of Suffolk Hills, I have to strongly disagree with the proposed rate increase for storm water utility.

Please become more efficient with what you receive now, or make cuts.

Thank you for your time.

Ramsey, Aimee

To: [redacted]
Subject: RE: Base Rate Increase for Residential Properties.

From: [redacted]
Sent: Wednesday, April 20, 2016 3:34 PM
To: Ramsey, Aimee <aramsey@orovalleyaz.gov>
Subject: Re: Base Rate Increase for Residential Properties.

Good Afternoon Aimee,

First, let me start by thanking you for your immediate response to my e-mail below.

Second, given what I have read in your reply below I have a couple of questions I would like to pose to you - please see the following:

1.) Several years ago Oro Valley installed concrete curbs on the north side of our street, starting at the top and came down about 3/4 of the way. From that point to the bottom of our street (again the north side) they dump huge piles of rocks in the drainage ditch in front of the houses. Now that's all Oro Valley did, after years of run off from the monsoons along with the normal rain storms. Those piles of rocks ended up with large amount of debris gathering in those rock piles -whether it be dirt or dead vegetation, thus cause future water drainage to expand beyond the normal flow of the ditch area. Now to the best of my knowledge "NO" from Oro Valley knock on the individual homeowner door to explain what this was being done, along with what to do if as I noted previously if the water starts to erode into their front yard.

2.) I believe it was Two (2ea) year ago when we had those heavy rains during the Monsoon season in the month of August. Which for the most part expose a lot of utilities lines at the upper end of our street as well as rest of the Shadow Mountain Estates. Shortly afterwards a Oro Valley town engineer shows up at our front door to talk about the damage these rains had cause to our washes. When I questioned him on the time line for a response to cleaning up our washes, he believe this would happen in the next couple of months. Well, a long story short, this same engineer shows-up at my home about ten or eleven months later telling me that Oro Valley is going to start cleaning up the washes. To be perfectly honest with you/Aimee, there was "NO" reason for me to believe that this was going to actually happen. So the washes that runs through the back of my property, they basically ran a front end loader through the middle of the wash and cut some trees branches. I told this individual that if they felt that the many trees that in the wash and on my property needed to be remove to ensure better water flow for the future, you have my "OK" to remove them. Now to be perfectly honest with you/Aimee, from what I have seem I'm not impress with the work that was done.

So, I'm thinking what I have noted above falls into the category of the storm water. In closing, I want to thank you for your time and patience regarding my questions to this matter.

Sincerely
Richard A. Yurmanovich

Ms. Wendy L. Camp
[redacted]

4-20-16

Dear Oro Valley -

I and my late husband built our home 33 years ago. I do not live in a gated or golf community, nor do I have extra funds for lots of "wants." I cover the "needs."

I feel the increase of the current Storm Water Utility fee is <u>excessive</u>.

I remember complaints when it was started. "Double fee'd", as Pima Co. took out of our Prop. taxes for the same purpose.

A smaller amount perhaps, but to raise it an extra $1.60 a month is <u>wrong</u>.

P.S. I'm sure what I say won't matter, I felt I needed to speak.

Camp
[redacted]
Wendy Camp

Town of Oro Valley
Development and Infrastruture Services

Record of Comments - Stormwater Rate Analysis

Name/Address	Phone/Email	Comment	Staff Taking Call	Date	Would Like Call Back
Mr. Fauley		was concerned that the whole bill was increasing or just the SW fee by $1.60. Was provided an update an asssured the increase was $1.60 per month	Carmen Ryan	4/15/2016	Yes ☐
					No ■
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐

Please return once filled to Aimee Ramsey, Assistant Director. Or return by April 22, 2016

RESOLUTION NO. (R) 07-127

A RESOLUTION OF THE MAYOR AND COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA, TO ESTABLISH THE BASE RATE FOR THE STORMWATER UTILITY FEE FOR THE FISCAL YEAR 2007/2008.

WHEREAS, Oro Valley is a political subdivision of the State of Arizona, is vested with all rights, privileges, and benefits, and entitled to the immunities and exemptions granted municipalities and political subdivisions under the Constitution and laws of the State of Arizona and the United States; and

WHEREAS, pursuant to A.R.S. 9-511, *et seq.*, the Town has requisite statutory authority to acquire, own and maintain a stormwater utility for the benefit of the landowners within and without the Town's corporate boundaries; and

WHEREAS, pursuant to ARS 9-511, *et seq.*, the Town finds it necessary to establish a stormwater utility fee; and

WHEREAS, pursuant to ARS 9-511, *et seq.*, the Town provided the Notice of Intent to establish a Stormwater Utility Fee at the Oro Valley Town Council meeting of October 3, 2007; and

WHEREAS, the Town Council conducted a Public Hearing to discuss the proposed Stormwater Utility Fee on November 7, 2007; and

WHEREAS, on November 7, 2007 the Council adopted Ordinance No. (O) 07-40, Section 15-24-13, Stormwater Utility Fee System; and

WHEREAS, Sections 15-24-13(G)(3) and 15-24-13(G)(4) provide a process by which non-residential property uses may apply for a maximum 25% reduction in the monthly stormwater utility fee for which there shall be a one time administrative charge; and

WHEREAS, Section 15-24-13(H)(1), Base Rate requires that the Council set the base rate for calculating the Stormwater Utility Fee on an annual basis;

NOW THERFORE, BE IT RESOLVED, BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA:

SECTION 1. That the Stormwater Utility Schedule of Fee base rate for FY 2007/2008 is hereby adopted at a rate of $2.90 /month as set forth in Exhibit "A".

SECTION 2. That the one time application fee for a reduction or credit towards the monthly Stormwater Utility Fee for non-residential uses is set at $100.00 as set forth in Exhibit "A".

SECTION 3. That the Mayor of the Town of Oro Valley and other Administrative Officials are here by authorized to take such steps as are necessary to implement the Stormwater Utility Schedule of Fees as of January 1, 2008.

PASSED AND ADOPTED by the Mayor and Town Council of the TOWN OF ORO VALLEY, Arizona this 7th day of November 2007.

Paul H. Loomis, Mayor

ATTEST:

Kathryn E. Cuvelier, Town Clerk

11-9-07

Date

APPROVED AS TO FORM:

Town Attorney

11/9/07

Date

Exhibit "A"

STORMWATER UTILITY FEE
SCHEDULE OF FEES FOR FY 2007/2008

Base Rate	$2.90 /month
Application fee for rate reduction/credit	$100.00 (one time fee)

Town Council Regular Session **Item # 5.**

Meeting Date: 05/04/2016

Requested by: Paul Keesler

Submitted By: Aimee Ramsey, Development Infrastructure Services

Department: Development Infrastructure Services

Information

SUBJECT:

PUBLIC HEARING: ORDINANCE NO. (O)16-07, AMENDING THE TOWN OF ORO VALLEY TOWN CODE, CHAPTER 15, ARTICLE 24, SECTION 15-24-13, STORMWATER UTILITY FEE SYSTEM, SUBSECTIONS 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) AND 15-24-13(G)(4), DECREASING THE EQUIVALENT RESIDENTIAL UNIT (ERU) VALUE THEREBY INCREASING THE RATE FOR COMMERCIAL PROPERTIES FOR THE TOWN OF ORO VALLEY STORMWATER UTILITY; REPEALING ALL RESOLUTIONS, ORDINANCES, AND RULES OF THE TOWN OF ORO VALLEY IN CONFLICT THEREWITH; PRESERVING THE RIGHTS AND DUTIES THAT HAVE ALREADY MATURED AND PROCEEDINGS THAT HAVE ALREADY BEGUN THEREUNDER

RECOMMENDATION:

On January 21, 2016, the Stormwater Utility Commission voted to recommend approval of the Preferred Financial Scenario in the Stormwater Rates Analysis Report (attachment 3). The attached ordinance (attachment 1) with the Stormwater Town Code changes modifying subsections 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) and 15-24-13(G)(4) decrease in Equivalent Residential Unit (ERU) value thereby increasing Stormwater Utility rates (attachment 2) reflects this recommendation by the Stormwater Utility Commission.

EXECUTIVE SUMMARY:

A Stormwater Rates Analysis Report was developed over the past 24 months by the Stormwater Utility Commission, and upon review of the current rate, it had been determined that the current rate would be insufficient to cover the costs of stormwater management and to provide for the operation, maintenance, and capital improvements of the stormwater system in the Town. The Stormwater Utility has produced a Stormwater Rate Analysis Report due to the fact that the projected FY 2017 budget depicted an ending cash balance of the fund less than the 15% required by code.

This ordinance, if approved, will decrease the Equivalent Residential Unit (ERU), from 5000 to 4000 sq. ft. This change only affects commercial property and will have the net effect of raising the monthly utility fee paid by commercial properties.

Attached are the proposed changes to Oro Valley Town Code, Section 15-24-13, Stormwater Utility Fee System, subsections 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) and 15-24-13(G)(4) with additions in all CAPS and deletions in strikethrough text (Attachment 2). If the attached ordinance is approved, the new ERU value impacting the fee structure will become effective June 4.

BACKGROUND OR DETAILED INFORMATION:

Pursuant to A.R.S. § 9-511.01 and on March 2, 2016, the Council adopted a Notice of Intent to decrease Equivalent Residential Unit (ERU) value from 5,000 square feet (sf) to 4,000 square feet, increasing commercial property Stormwater rates and establishing a public hearing for May 4, 2016. The Stormwater Rates Analysis Report was made available for public review by placing a copy of the report in the Town Clerk's office, the Stormwater Utility Office and on the Stormwater Utility's webpage on March 3, 2016. It was also published in the Daily Territorial on March 7, 2016 (attachment 4).

Utility and Fee Rate History

The Town's Stormwater Utility has been in place since 2004, with a fee structure in place since 2007. The Utility was created to fulfil federally-mandated Environmental Protection Agency (EPA) minimum requirements to regulate pollutants that may enter our waterways. The EPA required the Town to obtain a Municipal Separate Storm Sewer Systems (MS4) permit, which regulates the overall stormwater quality of this region. The permit requires the Town to implement and comply with each of the following six activities, referred to as Minimum Control Measures:

• Public Education and Outreach
• Public Involvement/Participation
• Illicit Discharge Detection and Elimination
• Construction Site Stormwater Runoff Control
• Post-Construction Stormwater Management in New and Re-Development
• Pollution Prevention/Good Housekeeping for Municipal Operations

In addition to the MS4 permit, the EPA also requires the Town to obtain and adhere to a National Pollutant Discharge Elimination System (NPDES) General Permit and Construction General Permit (CGP). Both permits carry rules and regulations that touch on the above mentioned list.

The original Stormwater Utility fee that was established in 2007 is still in place today. It was created to provide the Town the fiscal resources needed to adhere to the above mentioned EPA rules and regulations. In addition to regulation compliance, the fee also provides for small stormwater construction and clean-up projects (vegetation clearing in washes) and larger project research and draft plans that could be submitted to the county for large scale project consideration.

On average, the Town has been receiving $720,000 per year in Stormwater Utility fee revenue. The fee itself is broken down into two components: The residential component, for which each single family residence within the Town is assessed a monthly fee of $2.90 per month regardless of the size of the residence; and monthly commercial assessment, which is determined by multiplying the base rate of $2.90 per month by the amount of impervious surface (rooftops, driveways, sidewalks, parking lots) on property divided by an ERU, which is presently 5,000 sq. ft.

The Stormwater fee has been funding the Town's ability to adhere to the federal stormwater quality issues mentioned above as well as trying to maintain the capacity within the drainage passage infrastructure throughout the Town. The infrastructure consists of over 50 linear miles of public washes and is coordinated with various HOAs on over 146 linear miles of private washes, including a multitude of culvert, outflow devices and basin maintenance.

Reason for Fee Increase

Due to new technologies and increased awareness of stormwater quality impacts to natural wash systems, combined with rule changes within the EPA permits, the Town is required to do more stormwater management than it currently has resources to accomplish. The two recent events over the past couple of years are great examples for the need to increase Stormwater Utility activities:

• In February 2014, the Town's Stormwater management was audited by representatives of Arizona Department of Environmental Quality (ADEQ) and EPA. The Town was found deficient in 13 areas ranging from suggestions of better permit compliance practices up to not adhering to recent regulatory rule changes.

• The September 8, 2014 storm that highlighted weaknesses within much of the Town's central stormwater infrastructure's ability to protect property and convey runoff to the region's major washes.

What the ordinance change will fund

The Stormwater Utility Commission evaluated several scenarios ranging from basic one year sustainability to fully funding large capital improvement projects. The Preferred Funding Scenario (PFO) assumes that the Town is provided adequate resources to meet minimum state requirements and fully develop a capital improvement program. The PFO does not fund major capital improvement projects at this time, due to the lack of specificity and required analysis on each project. Staff recommendations are based on a rates analysis to assure the proposal meets Town policies, provide funding to meet state requirements and develop a capital improvement plan to address deficits in our Stormwater infrastructure. More specifically, the funding will provide resources to add three additional FTE's to:

• Be MS4 Compliant – meet all 13 of the deficiencies highlighted during the EPA/ADEQ audit. This is a federal and state mandate
• Develop, implement and monitor a Stormwater Pollution Prevention Plan. This is a federal and state mandate
• Increase inspection activities for private development projects – federal and state mandate
• Fully develop an Infrastructure Assessment program to identify and maintain the current capacity - includes inventorying and mapping of the entire infrastructure system which is similar to our current Pavement Preservation program for street maintenance
• Program and design new and additional infrastructure to enhance community safety and discharge quality, which will allow the Town to either plan with additional future resources or request additional funding from outside agencies such as Pima County Regional Flood Control District to build these stormwater facilities
• Construct some small projects that address local, critical drainage issues

In addition to the increase of revenue generated by this change to the ordinance, the decrease of ERU also establishes a fairer parity between residential and commercial properties. That is because when the fee was established in 2007, an estimate was derived to create equity between residential properties and commercial properties to pay their fair proportion. At that time, it was estimated that the average residential property was 5,000 sq. ft. with respect to building envelope and hardscape (driveways, etc.). This established the utility ERU.

Through the attached report, looking at other communities, as well as calculating our own averages, it appears that the mean size of an Oro Valley residence, including all impervious elements, is 4,000 sq. ft. So in essence, residential customers have been paying a larger proportion to the Stormwater Utility than commercial properties. This amendment corrects that imbalance.

On January 21, 2016, the Stormwater Utility Commission voted to recommend approval of the Preferred Financial Scenario in the Stormwater Rates Analysis Report.

Impact of Ordinance Change
It is estimated a total of $516,000 annually is needed to accomplish the above mentioned outstanding tasks. In order to generate this additional revenue, there are two separate proposals being considered, raising the base fee rate and decreasing the ERU.

1. Fee Increase - This is being considered within the other Stormwater item being presented this evening.
2. Considered with this ordinance - Proposal to reduce ERU of impervious area from 5,000 sq. ft. to 4,000 sq. ft. - estimated this will generate approximately $68,000 annually and only affects commercial properties.

Without the ERU decrease and its effect to the monthly rate commercial properties remit to the Town, the Stormwater Utility will not have the resources to meet the increasing code mandates placed on the Town by both the federal (EPA) and state (ADEQ) jurisdictional authorities. In addition, we will not have the ability to increase our present infrastructure carrying capacity to help increase public protection from flooding and erosion. Both of these issues affect the Town's responsibilities for quantity and quality of our stormwater system.

The Stormwater Rates Analysis Report includes projections for five years; however, Stormwater rates will be reviewed annually. The Preferred Financial Scenario is a two-tiered approach structure and decreasing the ERU without the correlating base rate increase will not meet all revenue requirements and cash reserve requirements for the Stormwater Utility.

To date, 6 comments have been received (attachment 5).

FISCAL IMPACT:

This Town Code modification will impact commercial property only. The impact on each commercial property is dependent on the impervious service area.

The fiscal impact to the Town is anticipated to generate approximately $68,000 per year for the utility.

SUGGESTED MOTION:

I MOVE to (approve or deny) Ordinance No. (O)16-07, amending the Town of Oro Valley town code, chapter 15, article 24, section 15-24-13, Stormwater Utility fee system, subsections 15-24-13(a)(9), 15-24-13(c)(4), 15-24-13(g)(3) and 15-24-13(g)(4), decreasing the equivalent residential unit (ERU) value thereby increasing the rate for commercial properties for the Town of Oro Valley Stormwater Utility; repealing all resolutions, ordinances, and rules of the Town of Oro Valley in conflict therewith; preserving the rights and duties that have already matured and proceedings that have already begun thereunder.

Attachments

Attachment 1 - (O)16-07

Attachment 2 - Town Code Changes

Attachment 3 - Stormwater Rate Analysis Report

Attachment 4 - Public Notice

Attachment 5 - Comments Received

ORDINANCE NO. (O)16-07

AN ORDINANCE OF THE MAYOR AND COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA, AMENDING THE ORO VALLEY TOWN CODE, CHAPTER 15, ARTICLE 24, SECTION 15-24-13, STORMWATER UTILITY FEE SYSTEM, SUBSECTIONS 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) AND 15-24-13(G)(4), DECREASING THE EQUIVALENT RESIDENTIAL UNIT (ERU) VALUE THEREBY INCREASING THE RATE FOR COMMERCIAL PROPERTIES FOR THE TOWN OF ORO VALLEY STORMWATER UTILITY; REPEALING ALL RESOLUTIONS, ORDINANCES, AND RULES OF THE TOWN OF ORO VALLEY IN CONFLICT THEREWITH; PRESERVING THE RIGHTS AND DUTIES THAT HAVE ALREADY MATURED AND PROCEEDINGS THAT HAVE ALREADY BEGUN THEREUNDER

WHEREAS, pursuant to A.R.S. 9-511, *et seq*., the Town has requisite statutory authority to acquire, own and maintain a stormwater utility for the benefit of the landowners within and without the Town's corporate boundaries; and

WHEREAS, on March 2, 2016 the Mayor and Council approved Resolution (R)16-11, providing Notice of Intent to decrease Equivalent Residential Unit (ERU); and

WHEREAS, the decrease in the ERU value would be from 5,000 square feet to 4,000 square feet increasing commercial property Stormwater rates; and

WHEREAS, the Stormwater Rates Analysis Report supports the decrease in the ERU and was made available for public view on March 3, 2016

WHEREAS, the Mayor and Council have considered the proposed amendments to Chapter 15, Article 24, Section 15-24-13, Stormwater Utility Fee System, subsections 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) and 15-24-13(G)(4), of the Oro Valley Town Code, attached hereto as Exhibit "A" and incorporated herein by this reference, which would decrease to the Equivalent Residential (ERU) valued thereby increasing the rate for commercial properties for the Town of Oro Valley Stormwater Utility and find they are in the best interest of the Town.

NOW, THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA:

SECTION 1. That certain document entitled Chapter 15, Article 24, Section 15-24-13, Stormwater Utility Fee System, subsections 15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) and 15-24-13(G)(4), of the Oro Valley Town Code, attached hereto as Exhibit "A' and incorporated herein by this reference and declared a public record on May 4, 2016, is hereby adopted.

SECTION 2. All Oro Valley Ordinances, Resolutions, or Motions and parts of Ordinances, Resolutions, or Motions of the Council in conflict with the provisions of this Ordinance are hereby repealed.

SECTION 3. If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

PASSED AND ADOPTED by the Mayor and Town Council of the Town of Oro Valley, Arizona this 4th day of May, 2016.

_____
Dr. Satish I. Hiremath, Mayor

ATTEST:	**APPROVED AS TO FORM:**
_____	_____
Julie K. Bower, Town Clerk	Tobin Sidles, Legal Services Director
_____	_____
Date	Date

Proposed Town Code Changes

15-24-13(A)(9), 15-24-13(C)(4), 15-24-13(G)(3) AND 15-24-13(G)(4)

Article 15-24
STORMWATER

15-24-13 Stormwater Utility Fee System

A. **Findings.**

9. Management of the stormwater system to protect the public health, safety, and welfare as well as meet the Arizona Pollutant Discharge Elimination System Phase II permit and FEMA requirements requires adequate revenues. It is in the interest of the public to finance stormwater management with a fee system that is reasonable and equitable. Single-family residences will be charged a flat rate for one (1) ERU. Non-single-family and religious/educational property owners will be charged a multiple rate equal to the amount of impervious area on their property divided by the amount of one (1) ERU (**FOUR THOUSAND (4,000)** ~~five thousand (5,000)~~ square feet). This formula will charge property owners on the basis of their properties' impact to the stormwater system.

C. **Definitions.** For the purposes of this chapter, the following words and phrases shall have the meanings indicated:

4. "Base rate (BR)" means the Stormwater Utility flat fee to an ERU of ~~five thousand (5,000)~~ **FOUR THOUSAND (4,000)** square feet of impervious surface.

G. **Classification of Property for Purposes of Determination of the Stormwater Utility Fee.**

3. Non-Single-Family Residential Property (NSFR) Monthly Fee. A developed non-single-family residential (NSFR) property will be charged a fee for the number of ERUs of impervious area. The impervious area for developed NSFR property may be determined through site examination, mapping information, aerial photographs and other available information. NSFR without first flush capabilities or other approved stormwater pollution prevention devices shall pay

the base rate times the number of ERUs on the site. The monthly fee shall be determined by dividing the total impervious surface (in square feet) by ~~five thousand (5,000)~~ **FOUR THOUSAND (4,000)** and rounding that value up or down to the nearest whole ERU amount and then multiplying the result by the base rate to obtain the monthly fee. NSFR properties that incorporate first flush capabilities or other approved stormwater pollution prevention devices are eligible for a twenty-five percent (25%) reduction in the fee, providing they apply to and are approved by the Stormwater Utility Commission and meet the annual inspection and maintenance requirements.

4. Educational Facilities, Religious Institutions and Nonprofits Monthly Fee. A developed religious institution, school or other non-profit property shall be eligible for a twenty-five percent (25%) fee reduction provided they apply to and are approved by the Stormwater Utility Commission. In order to qualify for the fee reduction, the educational facility, religious institution or non-profit organization must conduct educational programs or other tasks on the topic of stormwater management as approved by the Stormwater Utility Commission. No developed educational facility, religious institution or nonprofit property shall pay less than seventy-five percent (75%) of the base rate. The monthly fee shall be determined by dividing the total impervious surface (in square feet) by ~~five thousand (5,000)~~ **FOUR THOUSAND (4,000)** and rounding that value up or down to the nearest whole ERU amount and then multiplying the result by the base rate to obtain the monthly fee.

2016

STORMWATER UTILITY

STORMWATER UTILITY RATE ANALYSIS

DATE: 01-21-2016

STORMWATER UTILITY – DEVELOPMENT & INFRASTRUCTURE SERVICES

TOWN OF ORO VALLEY | 11000 N La Canada Drive, Oro Valley, AZ 85737

Stormwater Utility Mission

To provide safe and efficient management of the Stormwater Utility, promote and protect life and safety, water quality, and the Town's working and natural environments before, during, and after the occurrence of storm events in accordance with all Town codes, standards and policies.

ORO VALLEY TOWN COUNCIL

Dr. Satish I. Hiremath, Mayor
Lou Waters, Vice Mayor
Brendan Burns, Council Member
William Garner, Council Member
Joe Hornat, Council Member
Mary Snider, Council Member
Mike Zinkin, Council Member

ORO VALLEY STORMWATER UTILITY COMMISSION

David Parker, Chair
Michael Stankiewicz, Vice Chair
Jim Mikolaitis, Commissioner
John Lynch, Commissioner
Frederick Wayand, Commissioner

TOWN STAFF

Greg Caton, Town Manager
Stacey Lemos, Finance Director
Paul Keesler P.E., Director
Aimee Ramsey, Assistant Director
Phil Trenary, Operations Manager
Michael Todnem P.E., Stormwater Sr. Civil Engineer

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PART I. Executive Summary

In Oro Valley the Stormwater program was initiated to fulfil the Environmental Protection Agency's minimum requirement to regulate first flush pollutants which may enter our waterways. The Town's Municipal Separate Storm Sewer Systems (MS4) permitted activities are part of this program and as discussed further will describe Stormwater Quality. Additionally the town has responsibilities regarding flood protection and floodplain management for our community that require maintenance and additional monitoring of aging Stormwater conveyance infrastructure hence known as Stormwater Quantity. This may require debris and sediment removal, vegetation management, facilities maintenance and possibly new facility construction for safety concerns.

The Stormwater Utility is responsible for Stormwater Quality and Stormwater Quantity. The functions and duties of the Oro Valley Stormwater Utility Commission "Commission" include reviewing and developing recommendations for Stormwater revenue requirements, Stormwater rates and fee structures. Controlling the quantity of Stormwater drainage runoff and aiding in water quality management has become essential in keeping our water safe for all of its many uses.

The Stormwater Utility has been in place since 2004 and associated fees since 2007. Since the initial rate was established no formal review of the program and associated rates has taken place. It is the intention of the Commission to annually evaluate the rates and analyze them to assure the recommendations meet Town policies and ensure the financial stability of the program and associated projects.

This Stormwater Rate Analysis Report contains detailed information on the Stormwater Utility fund. The Stormwater Utility (Utility) is an enterprise of the Town and generates revenue from rates, fees and charges and does not receive revenue from taxes or payments from the General Fund. The management of the monthly utility fees include personnel, operations and maintenance of the Small Municipal Separate Storm Sewer Systems (MS4) Program. The Utility pays the General Fund for services received including finance, human resources, information technology, legal, insurance and rental of office space. The Utility also pays the Water Department for billing and receiving of the monthly utility fee. In addition, since the Utility does not have its own maintenance crew, the Utility pays the Highway Fund for associated expenditures including street sweeping, storm cleanup and drainage channel vegetation management. The Utility also hires local contractors to complete Stormwater projects that exceed the work load capabilities of the operations street crew. This past fiscal year contract expenditures totaled just under $100,000 for contract maintenance that included culvert cleaning, erosion control/stabilization and street drainage interceptors

The Stormwater Utility Commission has made a recommendation for a Preferred Financial Scenario (PFS). The PFS has been selected to meet the mandated requirements as outlined under the Stormwater Town Code 15-24-13-H. The Town Council, by resolution, shall establish the annual (fiscal year) monthly base rate for the Stormwater Utility fee. The base rate shall be calculated to ensure adequate revenues to fund the costs of stormwater management and to provide for the operation, maintenance, and capital improvements of the stormwater system in the Town.

Under the Preferred Financial Scenario, the Operating Fund will have an approximate ending cash balance of just over $200K at the end of the five-year projection period. A cash balance of 15% (based on revenue projection) is required by Town Code. This amount preserves a balance of 17% to 25% depending on the fiscal year and the associated capital expenditure requirements. The Preferred Financial Scenario includes cash funding to preserve $50K per year for culvert and wash cleaning as well as increased expenditures on internal small projects by $80,000 per year or $400,000 over the five-year period. The Preferred Financial Scenario proposes no other new debt for capital expenditures.

This is the first year since establishment of the rate in 2007 that the rate has been reviewed. The Stormwater Rate Analysis is prepared based on the most up-to-date information available for a five-year projection period. It is important to note that there was a five-year moratorium on fee adjustments from 2007 until 2012.

Operational needs and capital improvement requirements change annually and are carefully evaluated when they are included in the analysis. The Stormwater Utility Commission over the last 18 months reviewed several scenarios, however, based on the necessary funding amounts required to meet mandated outcomes, maintenance requirements, and have a five-year sustainable rate the proposed $4.50 fee per ERU was recommended. Table 1 reflects the proposed rate changes to the Stormwater Utility fee.

Table 1

Stormwater Preferred Funding Scenario

		FY 2015/16		FY 2016/17
Monthly Stormwater Utility Fee/Unit		**Current**		**Change ERU**
Residential Rate		**$2.90**		**$4.50**
Commercial Rate		**$2.90**		**$4.50**
ERU = Square Feet		**5,000**		**4,000**
# of Units:				
Residential		17,460		17,749
Commercial		5,068		6,335
Total Units:		22,528		24,084
Revenue:				
Gross Revenues	$	783,974	$	**1,300,536**
Funding from Outside Sources	$	3,250	$	3,250
Grant Funds (one time)	$	35,000		
	$	**822,224**	**$**	**1,303,786**
Additional Revenue			**$**	**516,562**

Purpose of Fee

- Program Development – project definition
- Program Proposal – project design and costing
    - Budget development

    - CIP development
- Construction Management
    - New projects
    - Maintenance Oversight
- Increased Inspections due to State and Federal reporting regulations
    - Newly identified washes
    - Additional residential requirements
- Management of existing assets
    - Review of status of infrastructure stability
    - Service and maintenance work order schedules
    - Annual review

PART II. Program Information and Background

Why Must We Manage Stormwater?

The Town of Oro Valley administers, operates, and maintains a Stormwater Utility meant to:

- Preserve valuable natural resources
- Protect people and property
- Reduce nuisance flooding
- Improve water quality

The U.S. EPA has estimated that about 30 percent of known pollution to our nation's waters is attributable to stormwater runoff. In 1987, Congress directed U.S. EPA to develop a regulatory program to address the stormwater problem. The U.S. EPA issued regulations in 1990 authorizing the creation of a NPDES permitting system for stormwater discharges from a select group of industrial activities. The National Pollutant Discharge Elimination System (NPDES) is the administrative mechanism chosen for the stormwater permitting program. In Arizona, this program is called Arizona Pollutant Discharge Elimination System (AZPDES). An AZPDES permit is required for any point source discharge of pollutants to the Waters of the United States. Because stormwater runoff can transport pollutants to either a municipal separate storm sewer system or to the Waters of the United States, permits are required for those discharges.

ADEQ has prepared a draft 2016 Small Municipal Separate Storm Sewer System General Permit (Small MS4 GP) that is intended to succeed the 2002 Small MS4 GP (Permit No. AZG2002-002) which is currently administratively continued. The review and subsequent adoption of this general permit is scheduled to occur in early 2016. The draft general permit 2016 builds on the requirements of the previous general permit and is designed to control pollutants to the Maximum Extent Practicable (MEP). The new draft requires updates in the SWMP consistent with the specific permit requirements, implementing the program and evaluating the BMP's as an iterative process to ensure BMP effectiveness. The new draft permit will contain more specific tasks and details than the current 2002 general program and therefore require additional management and program compliance to control pollutants.

Stormwater Infrastructure

Table 2

Assets Listing	2007	2015	Change	Growth
Miles of FEMA designated floodplains/levees	18	18	0	
Miles of underground storm pipe	4.5	6.5	2.0	44%
Miles of public drainage easements	5	5	0	0%
Street catch basins/inlets	400	560	160	40%
Culverts	180	209	29	16%
Detention basins	40	127	87	218%
First flush devices	50	66	16	32%
Outfalls	150	261	111	74%
Lineal miles of mapped washes	NA	195	NA	

as of August 2015

The Arizona Department of Environmental Quality (ADEQ) conducted an audit of Oro Valley's Municipal Separate Storm Sewer System (MS4) program to assess compliance with the Town's MS4 permit and Stormwater Management Plan (SWMP) on February 26-27, 2014.

The audit included document reviews, interviews with Town program managers, and field verification inspections. During the audit, ADEQ noted areas of potential noncompliance with the permit. According to the Arizona Administrative Code (AAC.) RI8-9-A905(A)(3)(a) and 40 Code of Federal Regulations (CFR) 122.41(h), the Town is required to submit information to ADEQ regarding compliance with the Permit and the Town's Stormwater Management Plan. This plan was submitted and accepted September 30, 2015.

The Preferred Financial Scenario rate increase to $4.50 per month with a reduction in the Equivalent Residential Unit (ERU) to 4,000 square feet will allow the Stormwater Utility to meet:

- MS4 compliance and review minimums as addressed in the Stormwater Management Plan submittal (Stormwater Quality)
    - Redesign program to meet new 2016 General Permit Requirements as outlined by ADEQ
- Infrastructure Project Identification 20% to 30% level (Stormwater Quantity)
  - costing
  - design
  - build under $80K projects
- Work order development (Stormwater Quality and Quantity)
  - Prioritization of inspection and maintenance scheduling
  - increased inspections
  - increased Public Education
- Stormwater Utility Program Sustainability
  - 5 years

Note: Program sustainability only accounts for funds to preserve activities defined above. Additional County or other external funds must become available to pay for larger capital projects which will be identified. In the absence of County or other external funds, the rate structure will need to be revised again within one or two years or so that large capital projects identified by the new staff can be completed and funded by the Stormwater Utility.

Background

Oro Valley is located in northern Pima County approximately six miles north of the Tucson city limits. The valley itself was formed by the Canada Del Oro Creek that begins in the Santa Catalina Mountains. The town sits at an elevation of 2,620 feet, covers over 34 square miles and has a current population of just over 41,000. Oro Valley was incorporated in April, 1974.

The Town initially became covered by the NPDES General Permit For Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in 2004. This permit, often simply called a "Stormwater Permit," is required by the US Environmental Protection Agency and is implemented in Arizona by the Arizona Department of Environmental Quality (ADEQ). Neither the US EPA nor the State of Arizona provides any funding to Oro Valley for the operation of the Stormwater Program.

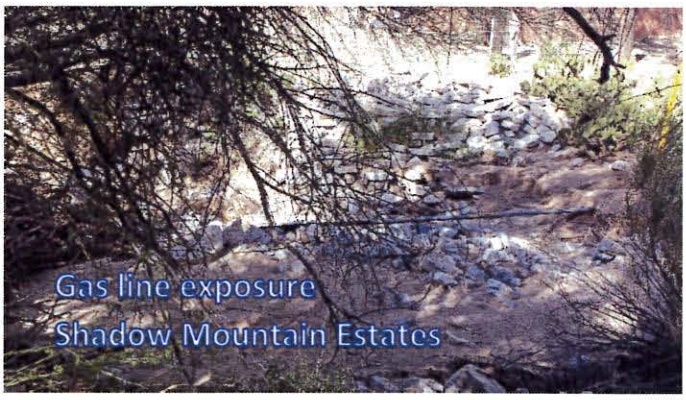
Most cities and counties with a population greater than 10,000 and/or located in an "urbanized area" as defined by the US Census must follow this permit, which regulates discharges of stormwater runoff to Waters of the United States.

Stormwater Purpose

The Stormwater Utility program is responsible for meeting all quality and quantity issues including the Town's Stormwater Management Plan, Floodplain and Erosion Hazard Management, and supporting all other Town programs that are impacted by storm events. This program also coordinates with Federal, State and local government agencies related to the Town's Stormwater program.

Typical Stormwater Utility Activities Include:

- Implementation of all MS4, ADEQ and EPA requirements
- Drainage Channel and Street Shoulder Vegetation Maintenance (Quantity)*
- Storm System Inspections and maintenance/cleaning (Quantity)of culverts, basins, grade control structures, storm sewer inlets/outlets and drainage channels
- Storm Cleanup
  - Street Sweeping (Quality) - Stormwater determination* vs Normal street surface deterioration
  - Low water crossings (Quantity/Quantity)depositing sand, rock, boulders and vegetation debris removal in roads during larger events of monsoons
- Storm generated Debris Removal* in washes (Quantity)
- Road Safety (Quantity) due to storm activity at low water crossings and shouldering due to erosion*
- Public Education and Outreach(Quality)
- Technical Support for other divisions within the Town(Quality/Quantity)



- Minor Construction and Repair Projects (Quantity)– Post storm event structural damage that endangers the public or may realize more extensive damage if not repaired immediately*
- In-House Hydrologic and Hydraulic Studies and Designs(Quantity)
- Floodplain Permit Review (Quantity/Quality)
- Stormwater Pollution Prevention Plan (SWPPP) Plan Review (Quantity)
- Development Review (Quantity/Quality)Preparing and Revising/Updating Town Ordinances and Manuals (Quality/Quantity)

The Stormwater Utility fee also reimburses the Highway Fund for utilization of the streets crews for some of the activities listed above and marked with an (*). The allocated expenditures are determined by task and scope and are assigned to the Stormwater Utility funds and are not considered routine street maintenance.

Municipal Separate Storm Sewer System (MS4) - Stormwater Quality

The permit provides requirements in each of the following six Minimum Control Measures (MCM):

1. Public Education and Outreach
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management in New Development and Re-Development
6. Pollution Prevention/Good Housekeeping for Municipal Operations

More information about each of these six main categories is provided below.

Public Education and Outreach & Public Involvement/Participation

These two related topics focus on educating and involving the public in all areas of stormwater management. Several factors associated with the program costs:

- The size of community and our target audience in order to increase Stormwater awareness
- The ability to tie into other municipal/3rd Party education programs versus developing our own
- Types of education and outreach media used
- The method of distribution through available volunteer activities/programs
- The methods of measuring success and reporting to ADEQ.

Illicit Discharge Detection and Elimination

Our Stormwater Permit requires and is dependent upon identifying and eliminating "illicit discharges." Town Code Article 15-24-14 defines the Town's Stormwater Quality Management System and Discharge Control Ordinance, passed in 2008. It defines "illicit discharges," prohibits them, and provides for enforcement options to eliminate them.

Program costs associated with eliminating "illicit discharges" are generated from the age and extent of infrastructure, the mapping status and inventory of entire drainage system. At present, services are based upon a complaint-based system versus a more costly proactive detection. Current revenue covers staffing, contractor management, equipment to detect discharges, and identify the source and cost of the actual repairs. It also includes Software cost for database management, reporting and program evaluation.

Construction Site Stormwater Runoff Control

The next requirement of the Stormwater Permit is the control of runoff from construction sites. Discharge of sediment or other waste (concrete truck washout, litter, etc.) from construction sites is prohibited by the Town.

A permit is required for any land disturbance of any size inside the Town with a few exceptions. Permit information and an application form may be picked up at the Town

located at 10000 N La Cañada Drive or may be downloaded from this website page. Please call one of the contacts at the top of the page for more information. In addition, any land disturbance totaling more than one acre requires a permit from the Arizona Department of Environmental Quality (ADEQ).

Program costs associated with this program element are dependent on the number of active construction sites, the number of development projects in the pipeline, the average number of inspections per site, and the current compliance record along with the efficiency of enforcement.

Post-Construction Stormwater Management in New Development and Re-Development

Our Stormwater Permit requires treatment of stormwater runoff from areas of new development and re-development. The cost factors associated with this part of the program are dependent upon the number of development projects requiring municipal review and inspection, the age and type of existing stormwater best management practices, future enhancement of the review process to look for and encourage a site design, land use planning for low impact development, and possible code updates to allow/foster green infrastructure.

Pollution Prevention/Good Housekeeping For Municipal Operations

The final of the six stormwater permit requirements involves the Town's own operations. The Town must evaluate all sources of potential pollution such as streets and roads, municipal parking lots, maintenance shops, outdoor storage areas, construction activities, parks maintenance and landscaping, and salt storage. Procedures to eliminate or reduce the potential for pollution must be developed, and employees must be trained on these procedures at least annually. Cost factors associated with this requirement include the number of Town facilities requiring pollution prevention plans, street sweeping and catch basin cleanout equipment and labor, and employee education and training.

Storm Mitigation

Clean up cost FY 2015 $34,000

Part III: Stormwater Utility Rate Proposal

Current Funding

Neither the State of Arizona nor the federal government provides funding for the Town's Stormwater Program. In 2007, the Town established a Stormwater Utility fee to provide funding for implementing the requirements of the Stormwater Permit and for small cleaning projects/larger project research and draft plans that could be submitted for county project consideration.

Pima County Regional Flood Control District (PCFCD) under the State of Arizona enabling legislation (Title 48 of ARS), is designated as a special taxing district and given the authority to levy secondary property tax on parcels within the Town of Oro Valley. The Town of Oro Valley and PCFCD have a very good relationship and over the past 10 years have been successful in the delivery of both large and small Stormwater projects. However, this funding is variable and not always available. In addition, the Flood Control District levy only provides funding for quantity issues and quality issues are solely the responsibility of the Town.

When the Stormwater Utility was first established, funding for projects was secured through the budgeting process and overseen by Town consultants. The FEMA Lomas Del Oro project in FY 09/10 was the last big project to be overseen by the Town. Since this time the PCFCD requests project submittals and then prioritizes them to determine which projects will move forward. This year Pima County Flood Control District has provided significant support in the area of wash maintenance. However, benefits from our partnership with PCFCD range from limited small clean up to large project and include capacity for drainage study. While a dedicated funding estimate is not available, the Town will continue to request assistance. From January through July of 2015, PCFCD contracted to have four lineal miles of debris and sediment removed, clearing existing blockages to improve channel flow and subsequently enabling mosquito abatement in areas throughout the east side of Town. Fortunately structural damage has been minimal and no major structural damage has occurred.

Pima County Regional Flood Control District and other sources
Annual Contribution to Oro Valley

Funding	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Direct	$ 3,507	$ 28,567	$ -	$ -	$ -	$ -
Projects	$ 471,000	$ -	$ 304,663	$ 290,000	$ 1,062,561	$ 731,862
Sediment Removal	$ -	$ -	$ -	$ -	$ 101,750	$ 118,600
Other Sources	$ 1,329,000	$ -	$ -	$ -	$ -	$ -

Projects
Linda Vista Gabions
Poinsetta Dr
Lomas Del Oro
La Canada Underpass to date
CDO River Park
CDO River Park Pedestrian Bridge
I10 and La Canada Underpass improvements In progress
Oracle Road Underpass improvements In progress

The PCFCD has already informed Stormwater staff that next year's funding will be limited. In addition, some items once available for funding such as low water crossings are no longer eligible for funding even though they remain a safety concern for the Town. The number of town projects is growing as more washes are identified and evaluated. Attachment E lists all known drainage and Stormwater issues regardless of size and scope that have been identified at this time. The Stormwater Utility intends to utilize part of the increased funding to develop not only a project list, but develop the designated project to a design level that will include costing scenarios for those projects under the Stormwater Utility purview. This process will allow the Town sound budgeting practices to evaluate capital improvements and identify projects to submit for potential funding from the Pima County Flood Control District. The new asset manager/engineer will be responsible for defining these projects including separating out unit costs for services/deliverables.

Current Rate

Single-family residences currently pay $2.90 per month, charged to their water bill or separately by the Town. Commercial facilities and non-profits are also charged $2.90 per "Equivalent Residential Unit" (ERU) of impervious area (driveways, patios, roofs, or other areas where stormwater does not infiltrate into the ground). At present an ERU is equal to 5,000 square feet per Town Code 15-24-13-G. The Preferred Financial Scenario includes a five year projection of the fund and evaluates the impact of future costs and revenue sources that will be required to meet those costs.

In order to cover various alternatives staff conducted an impervious area sample distribution study this year to best determine the basic ERU value. The result of the study indicates that the Town's average rounded ERU value is 3,700 square feet. The report is provided under Attachment F. Because the data used in the study may not include all impermeable surfaces, e.g. some driveways, the Commission recommends an ERU value of 4,000 square as more representative. Therefore the recommendation along with the rate adjustment is to reduce the ERU value to 4,000 sq. ft. This new ERU change will require the Town Code to be modified to reflect this new value. Along with the rate change the revised Town Code will be submitted to Town Council for consideration and approval.

National Average

There are currently 1511 Stormwater Utilities throughout the United States (Campbell, 2011). Western Kentucky University annually updates and provides access to their very extensive Stormwater Utility database as summarized in Appendix F. This survey provides us the opportunity to compare the Town's current rate structure with others nationally. However, the Western Kentucky University data survey results does not contain information about the scope of activities of responding Utilities. The Oro Valley Stormwater Utility is performing quality and quantity work whereas many survey responders may perform only quality work, so direct comparison may not be representative.

The average national rate, as of the 2014 study, was $4.01 per month. The rates range from "no fee" to $35.00 dollars per month to accommodate various programs with 10.6% of the national rates being $2.50 to $2.99, over 34.5% of the utilities have rates averaging $3.00 to $6.00 per month. In addition, for towns comparable in population to Oro Valley, approximately

256, the average monthly rate was cited as $4.26. The other noted comparison was the equivalent residential unit (ERU) value of impervious surface. Only 11.5% of the utilities had an ERU between 4,000 and 5,000 square feet. Over 22.8% classified an ERU as between 2,500 to 3,250 square feet. Many of the utilities, over 51.2% had an unspecified ERU.

Required Program Highlights

The additional funding proposed will not only provide for the sustainability of the core program, but also for increased utility infrastructure assets and associated maintenance requirements as well as fund the development of small specific community infrastructure projects.

ADEQ has prepared a draft 2015 Small Municipal Separate Storm Sewer System General Permit (Small MS4 GP) intended to succeed the 2002 Small MS4 GP (Permit No. AZG2002-002). This draft is scheduled to be adopted in early 2016, significantly changing and adding definition to the Minimum Control Measures (MCM) required by each MS4. Adoption of the new rate will provide funding for necessary staffing to ensure continued compliance.

Revenue Forecast and Requirements

Appendix A is a five year forecast for the Stormwater Utility should no rate increase occur. As depicted in the chart, the utility has a structural deficit. The FY 2016-17 recommended budget from staff would not meet the required reserve fund as outlined in the Town Code 15-24-10. A chart of the Stormwater Utility Fund is depicted in Appendix B.

The revenue forecast was based on analysis of the Stormwater Utility's monthly billing data from FY 2015-16 and a projection of growth in the number of housing units expected to be developed over the next five years. The revenue projects a flat fee not dependent on any type of usage but is only coordinated with the total number of ERU's calculated within the Town. The growth projected in residential units is determined by the Development and Infrastructure permitting staff based on trend analysis.

Appendix C provides the detailed information for moving forward with the Preferred Funding Scenario. A rate adjustment of $1.60 from $2.90 to $4.50 would provide for a stable and compliant Stormwater program. The increase is adopted through Mayor and Council resolution which was last reviewed November 7, 2007.

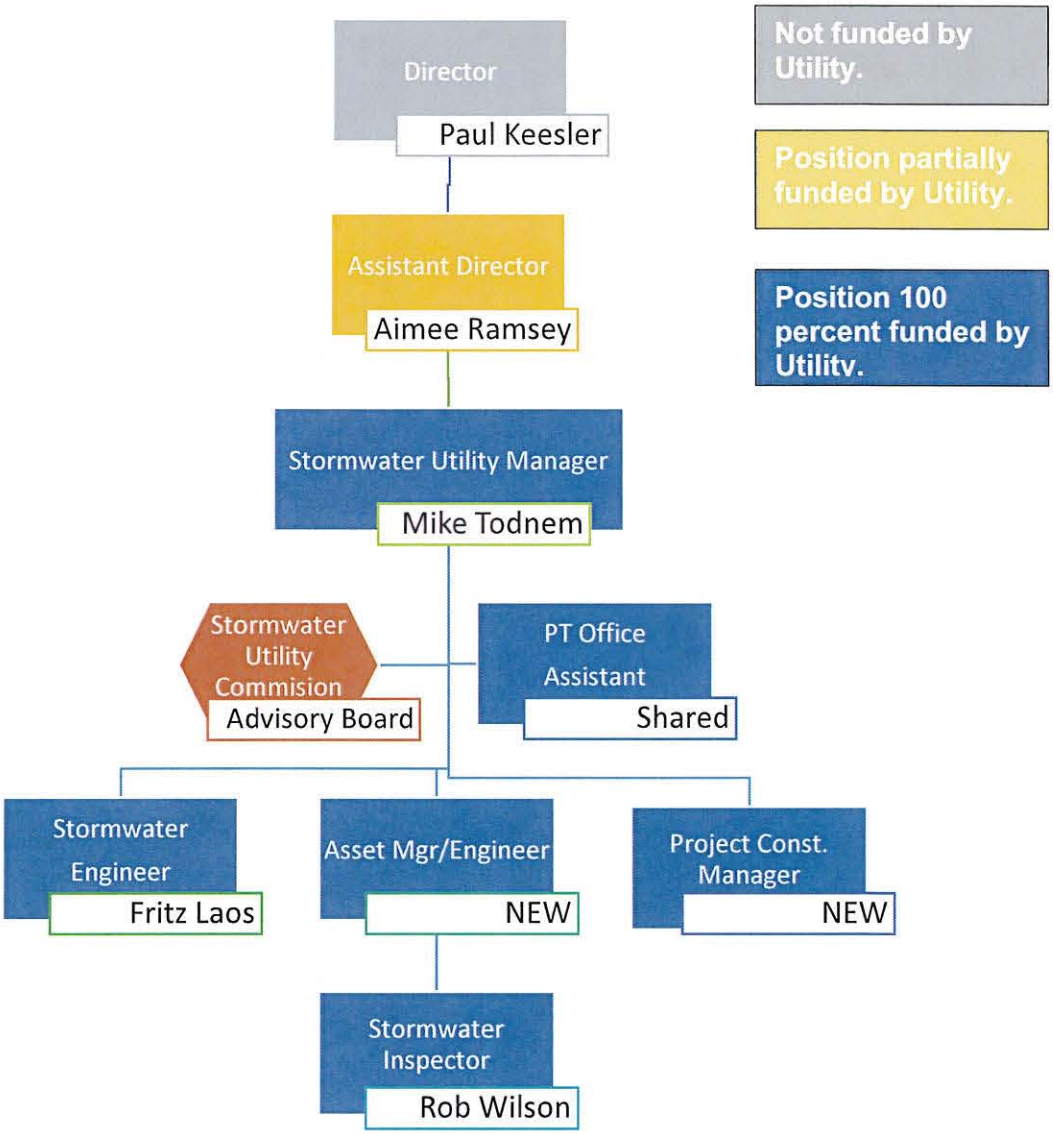
Over the past 8 years the Stormwater Management Program has developed. The opportunity presented to the Town with the initial fee structure allowed staff to develop principles and best practices to meet the requirements defined under the ADEQ MS4 program. The division produced its first annual report in 2008 and recently completed its first EPA/ADEQ Town wide audit. The program requirements to accomplish the utilities mission have been better defined and quantified revealing funding shortfalls. With the aftermath of the audit, potential future audits, and structural deficit, the rate increase is a necessity.

The future expenditures stay relatively stable and grow to meet the projected personnel costs, increase to support the Program Development, Design, Construction Management &

Maintenance program projects as outlined (see note on page 7 regarding program sustainability). In addition, the expenditures include a 3.5 percent annual merit increases. These projected increases are consistent with the General Fund's financial planning. The projected operations and maintenance (O&M) costs include inflationary increases in some areas that average 1.7 percent annually. The inflation factors were provided by the Arizona Department of Revenue.

Organization Chart

Proposed Stormwater Utility Division Structure



Maintaining our washes

Before

After

Rooney Wash

Appendices

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Appendix A – Stormwater Fund Status Quo 5 Year Forecast

Stormwater Fund 5 Year Forecast Revised: 1/22/2016

Assumes $2.90 fee/ERU

	FY 2015/16 Budgeted		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
			Draft Projected				
# of Units:							
Residential	15,764		16,107	16,496	16,827	17,053	17,203
NEW: projected Residential	343		389	331	226	150	150
Commercial	3,852		4,063	4,063	4,063	4,063	4,063
NEW: projected Commercial	211		-	-	-	-	-
Metro Water - Residential	1,353		1,353	1,353	1,353	1,353	1,353
Metro Water - Commercial	1,005		1,005	1,005	1,005	1,005	1,005
Total Units:	22,528		22,917	23,248	23,474	23,624	23,774
Carry forward Fund Balance	$ 299,844		$ 192,953	$ 93,695	$ (13,187)	$ (85,369)	$ (172,723)
Revenue:							
Monthly Stormwater Utility Fee/Unit	$ 2.90		$ 2.90	$ 2.90	$ 2.90	$ 2.90	$ 2.90
Gross Revenues	$ 783,974		$ 797,512	$ 809,030	$ 816,895	$ 822,115	$ 827,335
Funding from Outside Sources	3,250		3,331	3,415	3,500	3,587	3,677
Grant Funds	35,000						
	$ 822,224		$ 800,843	$ 812,445	$ 820,395	$ 825,703	$ 831,012
Expenses:							*3.5%*
Personnel							
3.80 Current Staff							
Total Personnel:	$ 346,620		$ 345,568	$ 357,663	$ 370,181	$ 383,137	$ 396,547
Contracts/Services							
Outside Professional Services*	116,795	a	117,963	119,143	120,334	121,537	122,753
Low Impact Development	35,000						
Other	50,000		50,000	50,000	50,000	50,000	50,000
Stormwater Maintenance	134,000	b	138,690	143,544	148,568	153,768	159,150
Vehicle Repair & Maintenance	19,800	a	19,998	20,198	20,400	20,604	20,810
Equipment Repair & Maintenance	32,000	a	32,320	32,643	32,970	33,299	33,632
Rentals	250	a	253	255	258	260	263
Telecommunications	1,400	a	1,414	1,428	1,442	1,457	1,471
Postage	250	a	253	255	258	260	263
Printing & Binding	1,000	a	1,010	1,020	1,030	1,041	1,051
Travel & Training	5,000	a	5,050	5,101	5,152	5,203	5,255
Membership	7,500	a	7,575	7,651	7,727	7,805	7,883
Office Supplies	2,000	a	2,020	2,040	2,061	2,081	2,102
Gasoline	24,500	a	24,745	24,992	25,242	25,495	25,750
Uniforms	750	a	758	765	773	780	788
Bad Debt Expense	750	a	758	765	773	780	788
Field Supplies	9,000	a	9,090	9,181	9,273	9,365	9,459
Safety	500	a	505	510	515	520	526
Software Maintenance & Licensing	1,500	a	1,515	1,530	1,545	1,561	1,577
SW Projects	50,000		50,000	50,000	50,000	50,000	50,000
Depreciation	135,000		135,000	135,000	135,000	135,000	135,000
Total Contracts/Services:	$ 626,995		$ 598,915	$ 606,021	$ 613,320	$ 620,818	$ 628,520
Capital Outlay/Projects							
Minor Assets	2,500	a	2,525	2,550	2,576	2,602	2,628
Misc - Mos. Trapping	3,407		3,500	3,500	3,500	3,500	3,500
Vehicle/Equipment Reserve	38,000		38,000	38,000	38,000	38,000	38,000
New Vehicles			-	-	-	-	-
Capital Interest	305		305	305	-	-	-
Equipment	46,288		46,288	46,288	-	-	-
Total Capital Outlay	$ 90,500		$ 90,618	$ 90,643	$ 44,076	$ 44,102	$ 44,128
Total Expenses:	$ 1,064,115		$ 1,035,101	$ 1,054,327	$ 1,027,577	$ 1,048,057	$ 1,069,195
Ending Balance/Contingency Reserve	$ 192,953		$ 93,695	$ (13,187)	$ (85,369)	$ (172,723)	$ (275,905)
	24.6%		*11.7%*	*-1.6%*	*-10.5%*	*-21.0%*	*-33.3%*
Vehicles			-	-	-	-	-
Equipment			-	-	-	-	50,000
Vehicle/Equipment Reserve - Replacement	$ 90,806		$ 128,806	$ 166,806	$ 204,806	$ 242,806	$ 230,806

⇨ Assumes Growth in Benefits & Wages **3.5%** [b]

⇨ Internal drainage projects remain the same

⇨ Cost Escalation **1.0%** [a]

Notes:

> **continue to charge out operations support to Hwy Fund per current method**

> ending revenue amounts are estimates subject to further revisions, and may not tie to cash balance in fund due to timing of revenues and expenditures

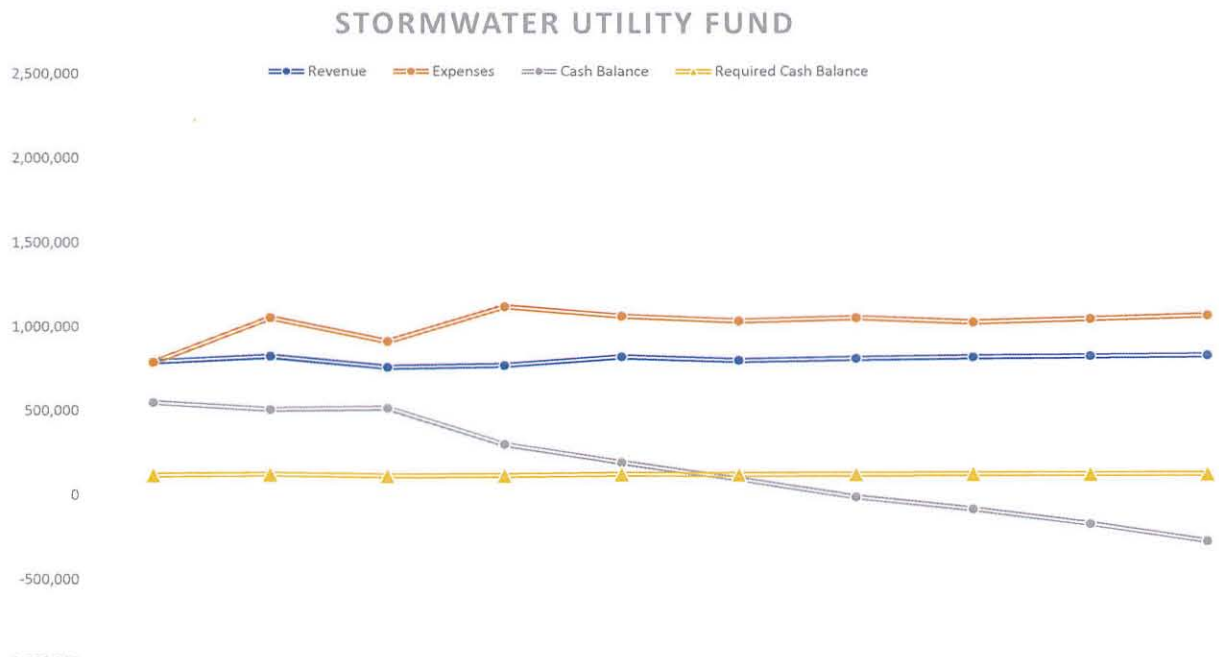
Appendix B – Stormwater Utility Status Quo Funding Charts

Town of Oro Valley

Stormwater Utility Division

CHART 1 - Status Quo Funding Chart

Fiscal Year	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$ 792,987	$ 826,738	$ 760,629	$ 771,888	$ 822,224	$ 800,843	$ 812,445	$ 820,395	$ 825,703	$ 831,012
Expenses	$ 788,247	$ 1,055,761	$ 913,564	$ 1,120,268	$ 1,064,115	$ 1,035,101	$ 1,054,327	$ 1,027,577	$ 1,048,057	$ 1,069,195
Cash Balance	$ 549,974	$ 509,768	$ 516,740	$ 299,844	$ 192,953	$ 93,695	$ (13,187)	$ (85,369)	$ (172,723)	$ (275,905)
Required Cash Balance	$ 118,948	$ 124,011	$ 114,094	$ 115,783	$ 123,334	$ 120,126	$ 121,867	$ 123,059	$ 123,855	$ 124,652



	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$792,987	$826,738	$760,629	$771,888	$822,224	$800,843	$812,445	$820,395	$825,703	$831,012
Expenses	$788,247	$1,055,761	$913,564	$1,120,268	$1,064,115	$1,035,101	$1,054,327	$1,027,577	$1,048,057	$1,069,195
Cash Balance	$549,974	$509,768	$516,740	$299,844	$192,953	$93,695	$(13,187)	$(85,369)	$(172,723)	$(275,905)
Required Cash Balance	$118,948	$124,011	$114,094	$115,783	$123,334	$120,126	$121,867	$123,059	$123,855	$124,652

**FY 2020/21 begin use of vehicle reserve for vehicle and equipment purchases.*

Appendix C – Stormwater Fund Preferred Scenario – 5 Year Forecast

Stormwater Preferred Funding Option - 5-year projection

Revised: 1/11/2016

Monthly Stormwater Utility Fee/Unit	FY 2015/16 Current	FY 2016/17 Change ERU	Notes
Residential Rate	$2.90	$4.50	$1.60 increase
Commercial Rate	$2.90	$4.50	$1.60 increase
ERU = Square Feet	5,000	4,000	*Commercial may apply for credit
# of Units:			Change in ERU requires the Town Code to be modified
Residential	17,460	17,749	
Commercial	5,068	6,335	Change in rate is accomplished through a resolution
Total Units:	22,528	24,084	
Carryforward Fund Balance	$ 299,844	$ 192,953	
Revenue:			- Corrects structural deficient
Gross Revenues	$ 783,974	$ 1,300,536	- Increases maintenance abilities
Funding from Outside Sources	$ 3,250	$ 3,250	Provides staffing to
Grant Funds (one time)	35,000		- Increases reporting / ADEQ BMP's
	$ 822,224	$ 1,303,786	- Develop a CIP program with projects
Additional Revenue		$ 516,562	- Manage and Inspect additional assets
Expenses:			*Return at a later date > if there is support for project implementation*
Personnel			
3.8 Current Staff	$ 346,620	$ 358,752	
New - Proposed			
1.0 Asset Mgr./Engineer	-	69,089	
1.0 Stormwater Prj.-Const. Mgr	-	83,982	
5.8 Total Stormwater Staff	-	153,071	
Total Personnel:	$ 346,620	$ 511,822	
Contracts/Services			**Tasks - Outcomes**
Outside Professional Services*	116,795	118,000	• Project Identification
ONE TIME GRANT	35,000	-	- costing
Design/Consultants	50,000	10,000	- design
Stormwater Maintenance - OPS	134,000	139,000	- build/maint under 80K
Increase Maintenance (Services)		80,000	• Work order development
Vehicle Repair & Maintenance	19,800	21,000	- prioritization / maintenance scheduling
Equipment Repair & Maintenance	32,000	32,000	- increased inspections
Rentals	250	500	- increased Public Education
Telecommunications	1,400	2,800	• New Program Compliance
Postage	250	250	• Personnel/Operations cost
Printing & Binding	1,000	1,000	increase for deliverables
Travel & Training	5,000	10,000	• Program Sustainability
Membership	7,500	7,500	- 5 years
Office Supplies	2,000	6,000	
Gasoline	24,500	27,000	
Uniforms	750	1,500	
Bad Debt Expense	750	750	
Field Supplies	9,000	18,000	
Safety	500	1,000	
Software Maintenance & Licensing	1,500	1,500	
SW Projects	50,000	50,000	
Depreciation	135,000	135,000	
Total Contracts/Services:	$ 626,995	$ 662,800	
Capital Outlay/Projects			
Minor Assets	2,500	3,500	
Misc - Mos. Trapping	3,407	3,500	
Vehicle/Equipment Reserve	38,000	38,000	
New Vehicles	-	35,000	
Capital Interest	305	305	
Equipment	46,288	46,288	
Total Capital Outlay	$ 90,500	$ 126,593	
Total Expenses:	$ 1,064,115	$ 1,301,215	
Ending Balance/Contingency Reserve	$ 192,953	$ 330,524	
	24.6%	*25.4%*	

Note: Program sustainability only accounts for funds to preserve activities defined above. Additional County or other external funds must become available to pay for larger capital projects which will be identified. In the absence of County or other external funds, the rate structure will need to be revised again within one or two years or so that large capital projects identified by the new staff can be completed and funded by the Stormwater Utility.

Five Year Projection	*Year 1* FY 16/17	*Year 2* FY 17/18	*Year 3* FY 18/19	*Year 4* FY 19/20	*Year 5* FY 20/21
Balance	$ 192,953	$ 330,524	$ 321,659	$ 328,160	$ 316,742
Revenue	$ 1,303,786	$ 1,325,867	$ 1,342,006	$ 1,353,831.73	$ 1,365,678
Personnel	$ 511,822	$ 529,736	$ 548,277	$ 567,466	$ 587,328
O&M	$ 523,800	$ 529,038	$ 534,328	$ 539,672	$ 545,068
Ops Main	$ 139,000	$ 143,865	$ 148,900	$ 154,112	$ 159,506
Capital	$ 126,593	$ 132,093	$ 104,000	$ 104,000	$ 119,000
Expenditure	$ 1,301,215	$ 1,334,732	$ 1,335,505	$ 1,365,250	$ 1,410,902
YE Cash Balance	$ 330,524	$ 321,659	$ 328,160	$ 316,742	$ 271,518
Reserve Balance Percent	*25.4%*	*24.3%*	*24.5%*	*23.4%*	*19.9%*
Purchases	$ -	$ -	$ -	$ -	$ 50,000
YE Vehicle/Equipment Cash Balance	**$ 128,806**	**$ 170,306**	**$ 215,306**	**$ 260,306**	**$ 255,306**
Vehicles/Equipment	Truck	Truck			Sweeper *Use Begins

> Accounts for depreciation

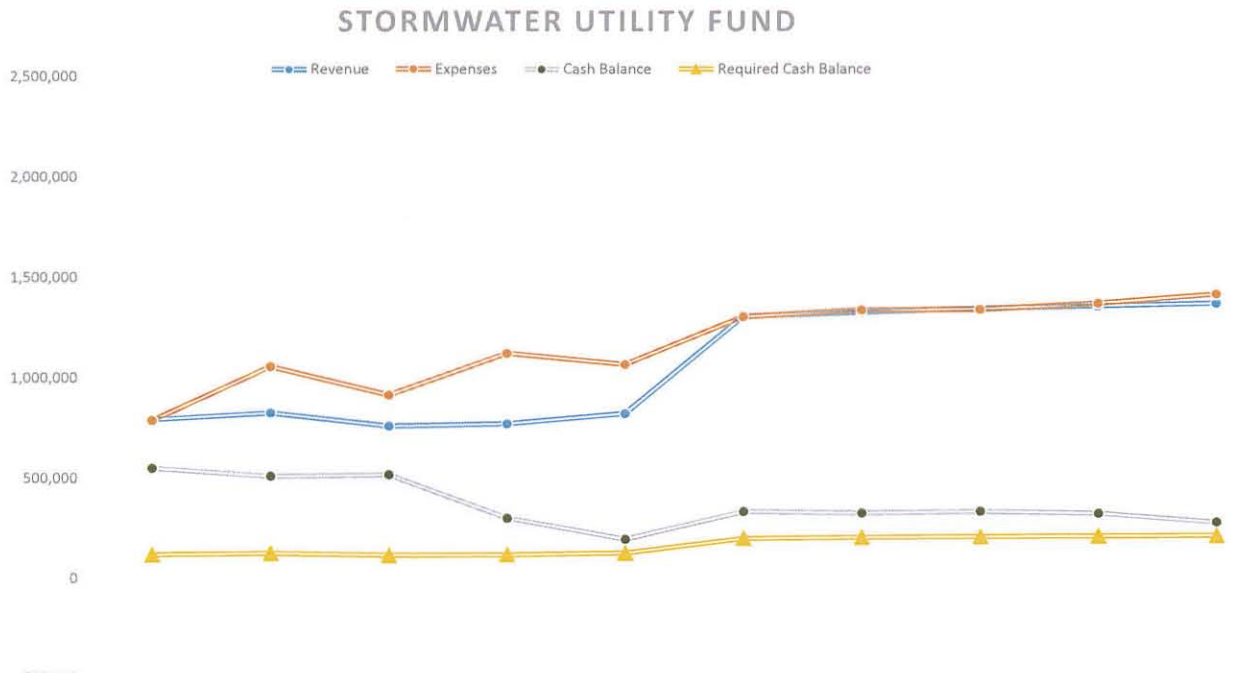
Appendix D – Stormwater Utility Preferred Scenario Funding Chart

Town of Oro Valley

Stormwater Utility Division

CHART 2 - Proposed Rate Adjustment Funding Chart

Fiscal Year	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$ 792,987	$ 826,738	$ 760,629	$ 771,888	$ 822,224	$ 1,303,786	$ 1,325,867	$ 1,342,006	$ 1,353,832	$ 1,365,678
Expenses	$ 788,247	$ 1,055,761	$ 913,564	$ 1,120,268	$ 1,064,115	$ 1,301,215	$ 1,334,732	$ 1,335,505	$ 1,365,250	$ 1,410,902
Cash Balance	$ 549,974	$ 509,768	$ 516,740	$ 299,844	$ 192,953	$ 330,524	$ 321,659	$ 328,160	$ 316,742	$ 271,518
Required Cash Balance	$ 118,948	$ 124,011	$ 114,094	$ 115,783	$ 123,334	$ 195,568	$ 198,880	$ 201,301	$ 203,075	$ 204,852



	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21*
Revenue	$792,987	$826,738	$760,629	$771,888	$822,224	$1,303,786	$1,325,867	$1,342,006	$1,353,832	$1,365,678
Expenses	$788,247	$1,055,761	$913,564	$1,120,268	$1,064,115	$1,301,215	$1,334,732	$1,335,505	$1,365,250	$1,410,902
Cash Balance	$549,974	$509,768	$516,740	$299,844	$192,953	$330,524	$321,659	$328,160	$316,742	$271,518
Required Cash Balance	$118,948	$124,011	$114,094	$115,783	$123,334	$195,568	$198,880	$201,301	$203,075	$204,852

**FY 2020/21 begin use of vehicle reserve for vehicle and equipment purchases. New rate adjustment accounts for depreciation.*

Appendix E – Stormwater Listing

The list of issues on the following pages is a compilation of drainage and Stormwater deficiencies that need to be evaluated, designed, programed or facilitated. Some of these issues have been on a list since 2001 while other deficiencies have been added as new washes and new assets have been identified and inventoried. This list is fluid and as additional issues are brought to our attention concerns, complaints or evaluation requests are made from the community the list is modified.

Issues have been categorized as;

- Restoration
- Maintenance
- Study
- Design/Construction

At this time none of these issues have not been assessed nor is there funding for any type of evaluation or mitigation. The ability to evaluate these issues will provide Once evaluated, the Town of Oro Valley will have a platform for requesting funding or competing for funding from outside sources to address some of these issues. THIS LIST IS NOT PRIORITIZED IN ANY ORDER NOR DOES IT INDICATE THAT THE TOWN IS RESPONSIBLE FOR EVALUATING OR MITIGATING THE ISSUES. PRIVATE WASHES DO NOT FALL UNDER THE STORMWATER UTILITY PURVIEW.

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Town of Oro Valley
Stormwater Projects

The following Stormwater Maintenance Projects are categorized by:

(S) · Maintenance Recurring - Sediment Removal & Cleaning (maybe storm related)
(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-1	401 E Strada Patania	Tangerine Hills		Install flared end and reconnect end of culvert, rip rap	Drainage Designs and Repairs - Construction	One Time - CIP	1	**FY 2015**	$ 7,500	Pima County
S-1	Canyon Shadow Wash	Canada Hills Parcel K	OV	Remove sediment in ROW north of Lambert - excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2	annual	$ 5,000	Oro Valley - unfunded
DC-2	Canyon Shadow Wash (Lambert to CDO)	Rancho Feliz (442-647)	OV	Soil cement wash bottom deteriorating at multiple locations with large erosion: also Repair concrete inlet wing wall on north side of Lambert	Drainage Designs and Repairs - Construction	Recurring +4 yrs	2	**FY 2014**	$ 10,000	1st Year completed - inspection in 2018
V-1	Canada Hills Parcel K	Canada Hills Parcel K	OV	Remove vegetation/debris in Canyon Shadows wash, ROW north of Lambert	Vegetation Removal - Maintenance	Recurring - OP	2	annual	$ 2,000	Oro Valley - unfunded
M-1	**Carmack Wash Basin**	**Pima County is performing the study**	OV	This basin that is comprised of numerous tributaries that have a 100 year flow of over 3,000 cfs as they leave the town boundaries. These tributaries are causing erosion, sedimentation, and flooding problems at numerous areas throughout the subdivisions they traverse	**Management Study**	One Time - CIP	1	In Progress	$ 100,000	Pima County should be completing this study
S-2	Carmack Wash			Remove debris in ditches Linda Vista from Oracle to Box culverts excessive sediment.	Sediment Removal - Maintenance	Recurring - OP	2	annual	$ 7,000	Oro Valley - unfunded
DC-3	Carmack Wash			Design drainage flow for Linda Vista, Oracle to Box culverts, new design to have concrete bottom for cleaning and sides armored for erosion control	Drainage Designs and Repairs - Construction	One Time - CIP	1	FY	$ 30,000	Oro Valley - unfunded
DC-4	Highlands Wash		PRI	Design repair from Con Arches to CDO, need 404 and easements to control erosion - Demo approx 1/2 of existing outlet south of Lambert Lane and build to correct outlet flow	Drainage Designs and Repairs - Construction	One Time - CIP	1	FY	$ 600,000	Private - unfunded
DC-5	Unknown Wash		PRI	Concrete wash repair behind Fry's off of La Canada	Drainage Designs and Repairs - Construction	One Time - CIP	2	FY	$ 80,000	Private - unfunded
S-3	Highlands Wash		PRI	Remove debris in channel upstream and down stream and clean con arches excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2		$ 30,000	Private - unfunded
DC-6	Lambert Lane		OV	Install short extension and flared Ends to all 4 culverts under Lambert Lane, East of La Cholla, place rip rap	Drainage Designs and Repairs - Construction	One Time - CIP	1	**FY 2015**	$ 25,000	Oro Valley - unfunded
DC-7	Lambert Lane (Casas)		OV	An unnamed wash crosses Lambert road at a dip crossing that causes significant flooding and sediment buildup at less than a 2 year storm event. In addition road edge erosion is affecting the structural integrity of the road. A box culvert project would alleviate this problem and provide all weather crossing.	Drainage Designs and Repairs - Construction	One Time - CIP	1		$ 600,000	Oro Valley - unfunded. PCFCD possible

Town of Oro Valley
Stormwater Projects

The following Stormwater Maintenance Projects are categorized by:

(S) · Maintenance Recurring - Sediment Removal & Cleaning (maybe storm related)
(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-8	Moore Road Box Culverts		OV	Moore road currently has 3 dip crossings that become a hazard annually during the monsoon season and must be closed at a 5 year event. The road is a safety concern during and after every rain event. This project will construct grade control structures and enhance the road structure with ribbon curbs to improve the safety and reduce maintenance during rain events.	Drainage Designs and Repairs - Construction	One Time - CIP			$ 800,000	Oro Valley - unfunded. PCFCD possible
DC-56	Saddle Valley/Logan's Crossing	Saddle Valley/Logan's Crossing	PRI	Clean Culverts at Preakness/ Review Maintenance to Gabion baskets in dipsection adjacent to Water Tank	HOA has drainage issues with in the subdivision which need to be re-engineered by them - Cost TBD	OneTime		annual	$ 4,000	Oro Valley - unfunded
DC-9	Mutterer's Wash	Oro Valley Townhomes	OV	Evaluate and redesign wash to improve water flow while designing walking path along side wash.	Drainage Designs and Repairs - Construction	One Time - CIP			TBD	Oro Valley - unfunded
V-2	Mutterer's Wash	Oro Valley Townhomes	OV	Remove vegetation/debris in wash	Vegetation Removal - Maintenance	Recurring - +4 yrs	1	**FY 2015**	$ 2,800	1st Year completed - inspection in 2018
DC-10	Naranja Park Town Site		OV	Add Rip Rap/Filter Fabric to south slope of Ball fields @ 560'x 70' = 39,200 sq.ft. Find Alternative to Stabilize Slopes	Drainage Designs and Repairs - Construction	One Time - CIP	2			Oro Valley - unfunded
DC-89	**Naranja Park Town Site**		OV	Design and build drainage structures to reduces deterioration of "slope/berm" along Monterra Hills road impacting sidewalks.	Drainage Designs and Repairs - Construction	One Time - CIP	1		$ 100,000	Oro Valley - unfunded
DC-11	Naranja Road @ Sawtooth		OV	Shot create repair along hill side east of Sawtooth within ROW	Drainage Designs and Repairs - Construction	One Time - CIP	2		$ 40,000	Oro Valley - unfunded
DC-12	Naranja Drainage Improvements	Ironwood High School	OV	New culverts at existing dip crossing to allow all weather access during hazardous rain events. The all weather crossings will provide access to Ironwood High School which is designated as an emergency management contact location during local emergencies. The improvements include nine 24" RCP, a 6 cell 4'X10' culvert.	Drainage Designs and Repairs - Construction	One Time - CIP			$ 1,700,000	Oro Valley - unfunded. PCFCD possible
DC-13	Northern Avenue Drainage Improvements		OV	Comprehensive Drainage study and Construction of Culverts for all low water crossings on Northern.	Drainage Designs and Repairs - Construction	One Time - CIP	2		$ 2,500,000	Oro Valley - unfunded
M-2	**Peglar Wash Basin**		OV	This project involves studying the Peglar Wash Basin (North of Magee Road between Northern Ave. & Oracle Road) within the Town of Oro Valley that is composed of numerous tributaries that have a 100 year flow of over 1,500 cfs as they leave the town boundaries.	**Management Study**	One Time - CIP	2		$ 75,000	Oro Valley - unfunded
DC-14	Peglar Wash Basin		OV	This project is to implement the recommendations from the Peglar's Wash Basin Mgt Study. This area primarily deals with waters that travel through the Suffolk Hill's portions of the Town.	Drainage Designs and Repairs - Construction	One Time - CIP	2		TBD	Oro Valley - unfunded
V-3	Rooney Wash		OV	Complete yearly landscape work Rooney Wash	Vegetation Removal - Maintenance	Recurring - OP	2	annual	$ 60,000	Oro Valley - unfunded
S-4	Shadow Mountain Estates West	Shadow Mountain Estates West	OV	Remove sediment in drainage easement behind homes excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2	FY 2015	$ 7,500	Due to storm impact - PC outsoruced work

Town of Oro Valley
Stormwater Projects

The following Stormwater Maintenance Projects are categorized by:

(S) · Maintenance Recurring - Sediment Removal & Cleaning (maybe storm related)
(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-15	Shadow Mountain Estates West	Shadow Mountain Estates West	OV	Design and repair alley drainage - erosion to area of exposed gas lines	Drainage Designs and Repairs - Construction	One Time - CIP	2		$ 20,000	Oro Valley - unfunded
V-4	Shadow Mountain Estates West	Shadow Mountain Estates West	OV	Shadow Mountain Estates vegetation removal in alley drainage ways	Vegetation Removal - Maintenance	Recurring - OP	2	FY 2015	$ 89,000	Due to storm impact - PC outsoruced work
M-3	**Un-named (Shannon) Basin**		OV	This project requires studying the area from Shannon road to Thornydale Road, from Tangerine Road to Naranja Road that would be used for future Town Development/incorporation. This is roughly 640 acres that is composed of numerous tributaries.	**Management Study**	One Time - CIP	2		$ 100,000	Oro Valley - unfunded. PCFCD possible
S-5	Vista Del Oro Estates	Vista Del Oro Estates		Remove sediment Vista del Oro Estates excessive sediment due to September 8, 2015 storm.	Sediment Removal - Maintenance	Recurring - OP	2		$ 7,500	Oro Valley - unfunded
V-5	Vista Del Oro Estates	Vista Del Oro Estates		Landscape in Vista Del Oro Estates Wash	Vegetation Removal - Maintenance	Recurring - OP	2		$ 5,000	Oro Valley - unfunded
M-4	**Un-named Basin**			This project requires studying the drainage areas that hold future annexation potential for the Town of Oro Valley. The study area would extend (south and west) from existing Town limits to the boundaries of Orange Grove (to the south) & Thornydale (to the west).	**Management Study**	One Time - CIP	1		TBD	Oro Valley - unfunded. PCFCD possible
STORM RELATED SMALL PROJECTS										
C-1	Newport Drive			Concrete drainage channel repair	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
C-2	Valle Del Oro	Oro Valley Estates		Concrete drainage channel repair	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
C-3	Atua	Oro Valley Estates		Drop inlet add riprap repair erosion	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
C-4	Lambert Lane-Rancho Sonora			Reconstruct drop inlet	Channel - Maintenance	Recurring - OP	2		TBD	Oro Valley - unfunded
SR-1	9130 N Shadow Mnt			Berm construction - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-2	10865 N. 1st Ave			Erosion control and stabilization - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-3	901 W. Valle De Oro	Oro Valley Estates		Erosion Control - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-4	321 W. Golf View			Erosion repair, rip rap shoulder - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded

Town of Oro Valley
Stormwater Projects

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(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
SR-5	180 E Catalina Shadows			Berm construction to protect driveway - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-6	14255 N. Ave			Erosion mail box and ponding driveway - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-7	8980 N. Camino de Anza			Erosion at mail box - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-8	422 W. Hardy			Repair berm - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
SR-9	255 E. Newport			Erosion edge of pavement - evaluate	Storm Related Issue - Maintenance	TBE	2		TBD	Oro Valley - unfunded
STORM RELATED ROAD CLOSURE - SAFETY										
DC-15	Buena Vista north of Spring Valley Dr.			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-16	Buena Vista south of Calle Concordia			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-17	Calle Concordia near Buena Vista			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-18	Calle Loma Linda @ Calle Bonita			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-19	Calle Solano wash area			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-20	CDO south of Riverfront Park			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-21	Hardy Road, wash west of the roundabout.			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-22	Highlands Mobile Park			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-23	La Cholla North of Glover			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-24	La Cholla South of Casas Entrance			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded

Town of Oro Valley
Stormwater Projects

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(V) · Vegetation Removal. Recently Completed (M) · Management Studies

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-25	La Cholla South of Lambert			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-26	La Cholla South of Naranja			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-27	Lambert east of La Cholla			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-28	Lambert Lane west of La Cholla			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-29	Landoran Ln	Oro Valley Estates		sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-30	Limewood East of Camino Del Plata	Limewood		sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-31	Linda Vista near Egleston	Vista Montana		sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-32	Lomas De Oro at Lambert			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-33	Moore East of La Cholla			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-34	Moore east of La Cholla			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-35	Naranja @ Ironwood Ridge HS			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-36	Naranja East of Shannon			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-37	Naranja West of La Cholla near HS			Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-38	Northern Ave behind Walmart			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-39	Northern Ave north of Cool			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded

Town of Oro Valley
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(V) · Vegetation Removal.
Recently Completed
(DC) · Drainage Design and Repair - Construction
(M) · Management Studies
(PR) · Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-40	Northern Ave south of camino cortaro			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-41	Northern Ave south of Magee			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-42	Overlook south of Calle Concordia			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-43	Pistachio @ culverts			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-44	Pistachio @ Pomegranate			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-45	Rancho Sonora Dr			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-46	Shannon South of Naranja			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-47	Shannon to stop traffic from crossing the wash at the north end.			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-48	Suffolk Dr @ Village			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-49	Tangerine - by Camino Del Plata	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-50	Tangerine - one at town boundary	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-51	Tangerine @ Camino Del Plata	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-52	Tangerine and area between La Cholla and La Canada.	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-53	Tangerine West of La Cholla	Tangerin Rd construction FY 2016		Road Closure - SAFETY sediment removal	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP	ongoing		In project cost	RTA/PAG funded - Tangerine Rd Project
DC-54	Valle Del Oro RD			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded

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(V) · Vegetation Removal.
Recently Completed
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(M) · Management Studies
(PR) • Private

No.	Location/Name	Subdivision	Owner	Description of Work		Cost Type	Priority	Year	Estimated Cost	Funding
DC-55	Valle Del Oro Rd at CC			sediment cleanup > Road Closure - SAFETY	Engineer, design and construct to make road and all weather road and eliminate road closure due to sediment - improving safety	One Time - CIP			TBD	Oro Valley - unfunded
DC-56	La Cholla @ Tangerine	La Cholla		Sediment removal from drop inlet culvert	Add Berm and waddles to slow and control/direct flow into the inlet		1	annual	$ 1,500	Oro Valley - unfunded
DC-58	8151 Northern Ave.	Northern Ave.		Debris removal from outlet	Storm Drain under Northern blocked by Veg/debris/Sediment at outlet		1	annual	$ 500	Oro Valley - unfunded
DC-60	8252 N Northern Ave.	Northern Ave.		Debris removal from inlets	Storm Drain under Northern blocked by Veg/debris/Sediment at inlet		1	annual	$ 1,500	Oro Valley - unfunded
DC-61	Casas Lindas Apts	Northern Ave.		Debris removal from inlet in ROW	Northern blocked by Veg/debris/Sediment at inlet		1	annual	$ 1,500	Oro Valley - unfunded
DC-62	2005 W Glover Rd	Ironwood Ranch		Debris/Veg /Sediment Removal from outlet of box culvert and manage downstream veg			1	annual	$ 2,500	Oro Valley - unfunded
DC-63	Bridge on Monterra Vista Dr.	Monterra Knolls		Debris/Veg /Sediment Removal from outlet of box culvert and manage downstream veg	Possible Detention Project - Engineer/Design		1	annual	$ 3,000	Oro Valley - unfunded
DC-67	Naranja Dr.	Canada Ridge		Box Culvert in ROW west of Eagle Crest Dr. - inlet /outlet need debris/veg removal			1	annual	$ 2,000	Oro Valley - unfunded
DC-69	605 E Windy Peak	Rancho Catalina		Drainage improvements	Discuss Easement behind lots from 625 E Windy Peak Dr - 8530 N Ranch Catalina with possible detention project. Al Coons		1		$ 10,000	Oro Valley - unfunded
DC-71	363 E Sunburst - Paul Parisi	Rancho Catalina		Veg removal and Channelization of wash running across Rancho Catalina Ave between 455 E Windy Vista Pl. and 8405 N Rancho Catalina Dr.			1		$ 7,500	Oro Valley - unfunded
DC-73	Oracle Square @ Hardy	Shadow Mountain Estates		Drainage improvements	Drainage Study - 900 cfs Coming across Oracle thru box culvert into Shadow Mountain Estates		1		$ 10,000	Oro Valley - unfunded
DC-76	Oracle Rd. Drainage N' of Calle Concordia	Vista Mantana		Drainage improvements - channelization of sheetflow onto Egleston contributing to flooding in Vista Mantana Subdivision	Drainage Study/Temporary Solutions		1		$ 30,000	Oro Valley - unfunded
DC-79	Rock Ridge Apts	Pusch View Lane		Drainage channell on S' side of Pusch View Lane Needs Veg cleanup/debris removal	ROW		1	annual	$ 1,500	Oro Valley - unfunded
DC-81	Rivers Edge S'	Rivers Edge (1-89)	PRI	Drainage Channel outlet to CDO needs Veg Mgmt	Private		1		Private	Private - unfunded
DC-83	Rivers Edge N'	Rivers Edge (103-120)		Box Culvert crossing Lambert needs sediment removed			1	annual	$ 4,500	Oro Valley - unfunded

Town of Oro Valley
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(V) · Vegetation Removal. Recently Completed (M) · Management Studies

No.	Location/Name	Subdivision	Owner	Description of Work	Cost Type	Priority	Year	Estimated Cost	Funding
DC-84	Vista Catalina	Vista Catalina		Channel N' of Vista Catalina/S' of Highlands Mobile Park requires veg/debris/sediment removal		1	TBD	$ 10,000	Oro Valley - unfunded
DC-57	8305 Northern Ave.	Northern Ave.		Debris removal from outlet/Cannot find inlet	Storm Drain under Northern blocked by Veg/debris/Sediment at outlet	2	annual	$ 500	Oro Valley - unfunded
DC-59	8090/8041 Northern Ave.	Northern Ave.		Debris removal from inlets/outlets	Storm Drain under Northern blocked by Veg/debris/Sediment at outlet	2	annual	$ 1,500	Oro Valley - unfunded
DC-65	Ironwood Valley Dr.	Tangerine Heights		Box Culvert - manage erosion cutting from road down sides of box culvert	need to engineer permanent solution	2	annual	$ 500	Oro Valley - unfunded
DC-68	Naranja Dr.	Canada Ridge		Box Culvert in ROW east of Canada Ridge Dr. - outlet need debris/veg removal		2	annual	$ 1,500	Oro Valley - unfunded
DC-70	8620 N Glenhurst Pl.	Sunnyslope		Drainage improvements	Changes in Federal land to the east - altering flows to the west	2		TBD	Oro Valley - unfunded
DC-75	Oracle Rd. Drainage N' of Calle Concordia	OV Aquatic Center		Drainage improvements	Drainage Study	2		$ 3,000	Oro Valley - unfunded
DC-80	Rooney Wash	Oracle Road E' side		Drainage channel on E' side of Oracle Rd. Needs Veg cleanup/debris removal at inlet	ROW /ADOT?	2	annual	$ 1,500	Oro Valley - unfunded
DC-85	10707 N Pomegranite Dr.	Monte Del Oro		Drainage requires refinement		2		$ 1,000	Oro Valley - unfunded
DC-64	Tangerine Road @ Highlands Wash (east of Monterra Knolls)	Monterra Knolls		Debris/Veg /Sediment Removal from inlet/outlet of box culvert and manage downstream veg		3	annual	$ 5,000	Oro Valley - unfunded
DC-66	Reflection Ridge Dr	Tangerine Heights		ROW erosion at entry from Tangerine and north along W'side ROW	Contact Water to discuss erosion around box	3		$ 500	Oro Valley - unfunded
DC-72	Campo Bello	Campo Bello		Drainage improvements	Drainage Study	3		TBD	Oro Valley - unfunded
DC-74	Oracle Rd. Drainage S' of Calle Concordia	Shadow Mountain Estates		Drainage improvements	Drainage Study	3		$ 1,500	Oro Valley - unfunded
DC-77	Oracle Rd. Drainage N' of El Conquistador Way	Mutterers Wash S'		Drainage from Wolfley/Ajacent Property adding to sediment Problem into Mutterers. Deep Erosion cuts next to spillway on El Conquistador Way (Private Property)	Discuss with property owners need for erosion control	3		TBD	Oro Valley - unfunded
DC-78	Valle Del Oro Town Homes	Mutterers Wash S'		Drainage Channell exiting Valle Del Oro townhomes needs to be cleaned...Veg/Debris/Sedimet	Discuss with property owners need for erosion control	3		Private	Oro Valley - unfunded
DC-82	Rivers Edge N'	Pusch Ridge Vistas II		Hillside at 10831 N Pusch Ridge View Pl. Needs Erosion Control	Pusch Ridge Vistas II HOA	3		Private	Oro Valley - unfunded

Town of Oro Valley
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(V) - Vegetation Removal.
Recently Completed
(DC) - Drainage Design and Repair - Construction
(M) - Management Studies
(PR) - Private

No.	Location/Name	Subdivision	Owner	Description of Work	Cost Type	Priority	Year	Estimated Cost	Funding
DC-86	1001 E Linda Vista Blvd	Pusch Ridge Estates		Sweep Road in front of house		3		$ 150	Oro Valley - unfunded
DC-87	Rancho Sonora Dr	Rancho Sonora		Trash in Wash up against barracades		3		$ 150	Oro Valley - unfunded
DC-88	Shadows of the Ridge	Shadows of the Ridge		Sediment removal from drop inlet culvert				$ 2,500	Oro Valley - unfunded

Appendix F – Western Kentucky University

Western Kentucky University
Stormwater Utility Survey
2014

What other are doing.
Summary

Cities, Towns, Counties		Average Fee	Lowest Fee	Highest Fee
Total US Stormwater Utilities	1511	$ 4.01	$ -	$ 35.00

Fee Range	No.			
No Fee	264	17.5%		
.01 to 1.49	96	6.4%		
1.50 to 2.49	137	9.1%		
2.50 to 2.99	160	10.6%	43.5%	Town of Oro Valley
3.00 to 3.49	81	5.4%		
3.50 to 3.99	99	6.6%		
4.00 to 4.99	206	13.6%		
5.00 to 5.99	136	9.0%	34.5%	
6.00 to 6.99	97	6.4%		
7.00 to 7.99	79	5.2%		
8.00 to 8.99	46	3.0%		
9.00 to 9.99	29	1.9%	16.6%	
10.00 to 14.99	61	4.0%		
15.00 to 35.00	20	1.3%	5.4%	
	1511	100.0%	100.0%	

Possible Rates - Residetial

Rates		FY 15/16		Increase Funds
$ 2.90	$ 783,974			
$ 3.63	$ 981,320	25.0%		
$ 4.35	$ 1,175,962	50.0%	$ 391,988	
$ 5.80	$ 1,567,949	100.0%	$ 783,975	
$ 7.25	$ 1,959,936	150.0%	$ 1,175,962	

Population				Average	High	
≤ 10,000	477	31.6%		$ 3.71	$ 19.43	
≤ 25,000	388	25.7%		$ 4.15	$ 14.00	
≤ 50,000	256	16.9%		$ 4.26	$ 14.46	Town of Oro Valley
≤ 75,000	105	6.9%	81.1%	$ 3.93	$ 11.99	
≤ 100,000	67	4.4%		$ 3.71	$ 13.05	
≤ 150,000	58	3.8%		$ 3.94	$ 14.26	
≤ 250,000	59	3.9%		$ 4.31	$ 14.00	
≤ 500,000	52	3.4%	15.6%	$ 4.01	$ 13.78	
≤ 1,000,000	34	2.3%		$ 4.34	$ 16.75	
> 1,000,000	15	1.0%	3.2%	$ 2.72	$ 13.48	
	1511	100.0%	100.0%			

ERU Classifications				
< 1000	18	1.2%		
< 1250	26	1.7%		
< 2000	64	4.2%		
< 2500	112	7.4%	14.6%	
< 2600	69	4.6%		
< 2750	68	4.5%		
< 3000	82	5.4%		
< 3250	125	8.3%	22.8%	
< 4000	122	8.1%		
< 5000	52	3.4%	11.5%	
5000 ≥ 9000	26	1.7%		Town of Oro Valley
9001 ≥ 25000	10	0.7%		
> 43500	35	2.3%		
Unspecified	702	46.5%	51.2%	
	1511	100.0%	100.0%	

Appendix G – Equivalent Residential Unit Study

Development and Infrastructure Services Department
Operations - Stormwater Utility

September 2, 2015

Re: Determining the basic ERU value

This memo describes the steps taken to date in the determination of an Equivalent Residential Unit (ERU) which will be applied to the determination of a revised Stormwater Utility fee structure. The use of available GIS data files in the determination of a revised ERU are discussed. Two GIS data files were used in the process, the first of which is a residential structure footprints file. The footprints file is a GIS data layer with file name [sde.SDE.Residentialfootprint] (footprints) which is located in the Town GIS repository. This file was generated by the Pima Association of Governments (PAG) using existing aerial photograph raster data. The footprint data is in the form of polygons which show the approximate footprint of nearly all the residential and some commercial structures in the Town. Any missing residential data would mostly be structures that did not exist at the time the data was prepared. The footprint data is intended to loosely represent the impervious areas within residential parcels. While the data contains essentially a complete set of all the residential structures, the actual impervious areas of each parcel are larger than what is indicated by the areas measured for the footprints file since the footprints file does not always include pavement areas, outside concrete areas etc... within each residential parcel. The data does, however, provide a consistent and complete source of information to use for our purposes. The second GIS data file used in this process represents the zoning in the Town with file name [sde.SDE.Zoning]. This data is also in the form of polygons with each polygon representing the specific zoning within its area.

Statistics for each zoning category were extracted by first overlaying the footprints file with the zoning file therefore isolating footprint sizes for each zoning district. The critical statistics were: 1) number of footprints within a particular zoning district and 2) the mean size of the footprints in that district. Footprint data for twelve zoning categories were observed (see Table 1). Please see the attached (Figure 1) for a distribution of Oro Valley zoning overlaid on the residential footprints within the Town.

Table 1. Oro Valley Zoning Districts with Selected Statistics

Zoning Category	Description	Count	Mean Footprint Size (sq-ft)
PAD	Planned Area Development	10,977	2752
R-4	Townhouse Residential	2,048	2461
R-6	Multi-Family Residential	198	1949
R1-300	Single Family Residential 0.15 RAC	99	5292
R1-144	Single Family Residential 0.30 RAC	416	3826
R1-43	Single Family Residential 1.00 RAC	449	3808
R1-36	Single Family Residential 1.20 RAC	1,563	3494
R1-20	Single Family Residential 2.00 RAC	350	4400
R1-7	Single Family Residential 5.00 RAC	645	3183
SDH-6	Site Delivered Housing District	281	1861
T-P	Technology Park	84	2181
C-1	Commercial	31	26,103

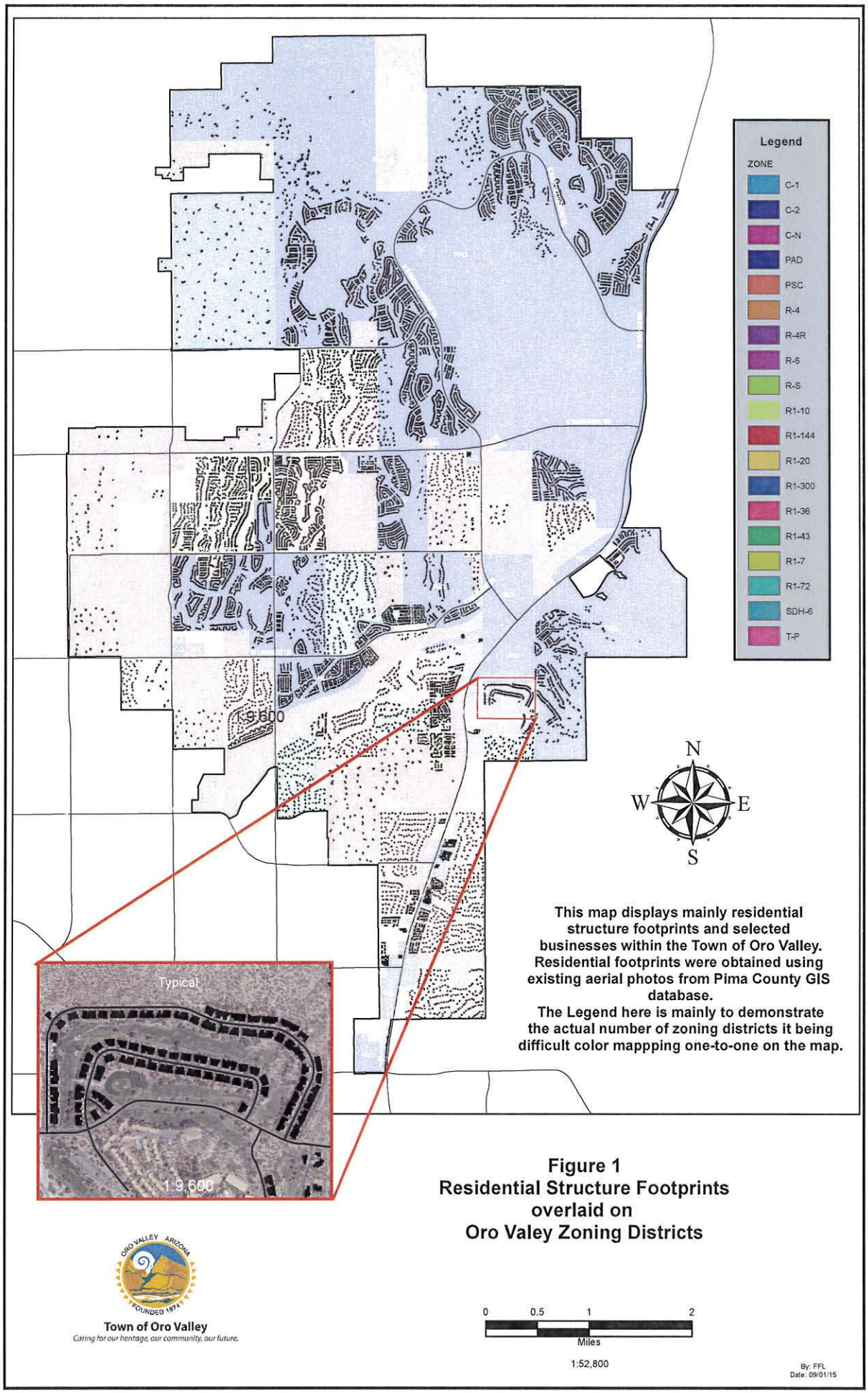
Note: The above data does not represent a complete list of all zoning districts and the Count values may be slightly higher for the districts that are shown. This calculation is a "first pass" intended to get a reasonable approximation of the statistics.

From the data identified in Table 1 all statistics for single family residential were used in the determination of an ERU value. Single family residential was used since it comprised the majority of the overall residential structures within the Town and it is typically used in the available literature when using ERU as a method of calculating stormwater fees. The ERU was calculated as the Count weighted average of the mean footprint sizes. The formula for calculating the ERU was as follows:

$$\frac{(\text{Mean Footprint Size}_{R1\text{-}300} \times \text{Count}_{R1\text{-}300}) + (\text{Mean Footprint Size}_{R1\text{-}144} \times \text{Count}_{R1\text{-}144}) + \ldots}{(\text{Count}_{R1\text{-}300} + \text{Count}_{R1\text{-}144} + \ldots)}$$

The result for this calculation is 3701.218 indicating a rounded ERU value of 3700. The current ERU for the Town is 5000. This method provides a consistent and measurable way to calculate the basic ERU.

Prepared by:
Fritz F. Laos, EIT, CFM
Civil Engineer
Town of Oro Valley Stormwater Utility



This map displays mainly residential structure footprints and selected businesses within the Town of Oro Valley. Residential footprints were obtained using existing aerial photos from Pima County GIS database.
The Legend here is mainly to demonstrate the actual number of zoning districts it being difficult color mappping one-to-one on the map.

Figure 1
Residential Structure Footprints overlaid on Oro Valey Zoning Districts

Town of Oro Valley
Caring for our heritage, our community, our future.

Document Path: F:\2 DIV OPERATIONS\STORMWATER\FRITZ'S DIRECTORIES\FFL Regional Floodplain\Maps\Imprvs_srfcs\Imprvs_srfcs.mxd

Bibliography

Campbell, C. Warren (2011). Western Kentucky University 2011 Stormwater Utility Survey, Western Kentucky University, Bowling Green, 51 pp.

PUBLIC NOTICE
RESOLUTION NO. (R)16-11
A RESOLUTION OF THE MAYOR AND COUNCIL OF THE TOWN OF ORO VALLEY, ARIZONA, PROVIDING NOTICE OF INTENT TO DECREASE THE EQUIVALENT RESIDENTIAL UNIT (ERU) AS DEFINED IN THE STORMWATER SECTION OF THE TOWN CODE THEREBY INDIRECTLY INCREASING THE STORMWATER RATES FOR THE ORO VALLEY STORMWATER UTILITY

WHEREAS, pursuant to A.R.S. § 9-511, et seq., the Town finds it necessary to consider decreasing the Equivalent Residential Unit (ERU) as defined in Chapter 15 of the Oro Valley Town Code, thereby indirectly increasing the Stormwater Utility base rate for the Oro Valley Stormwater Utility; and

WHEREAS, pursuant to A.R.S. § 9-511, et seq., the Town is required to give a Notice of Intent at a regular Town Council meeting to decrease Stormwater rates, fees and charges; and

WHEREAS, the Town has completed a Stormwater Rates Analysis Report, attached hereto as Exhibit "A", which supports decreasing the Equivalent Residential Unit (ERU); and

WHEREAS, not less than twenty (20) days prior to the public hearing on the proposed rate decrease, the Town shall cause to be published one time in a newspaper of general circulation within the Town's boundaries, a Notice of Intent showing the date, time and place of the hearing.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Council of the Town of Oro Valley, Arizona, that:

1. This Resolution serves as the Notice of Intent, which is hereby publicly given, for the Town of Oro Valley to decrease the Equivalent Residential Unit (ERU).
2. A public hearing shall be held at the regular meeting of the Mayor and Council at 6:00 p.m. on May 4, 2016, in the Council Chambers of the Town Hall, Town of Oro Valley, 11000 North La Cañada Drive, Oro Valley, Arizona, to deliberate and vote on the proposed increases.
3. Exhibit "A", attached hereto, be made available to the public in the Office of the Town Clerk and on the Town of Oro Valley Stormwater Utility website for review prior to the public hearing.

PASSED AND ADOPTED by the Mayor and Town Council of the Town of Oro Valley, Arizona, this 2nd day of March, 2016.

TOWN OF ORO VALLEY Dr. Satish I. Hiremath, Mayor ATTEST: APPROVED AS TO FORM Julie K. Bower, Town Clerk Tobin Sidles, Legal Services Director

*Exhibit "A" on file in the Town Clerk's Office

PUBLISH: The Daily Territorial
Mar. 7, 2016

Ramsey, Aimee

From:	Bob [redacted]
Sent:	Saturday, April 16, 2016 4:53 PM
To:	Storm Water OV
Subject:	storm water utility

Hi.
Got my statement today for my quarterly fee (1/1/16-4/1/16) for $8.70 due by 5/4/16. No problem there.

The reason I am emailing is because of the little blue note included with my bill. There are 2 reasons.

(1) Went to the website to view the "stormwater rates analysis report" at www.orovalleyaz.gov. Tried 3 different browsers and they all would not let me view that page because "The owner of www.orovalleyaz.gov has configured their website improperly." The error message goes on to say that it is an insecure connection and my personal information can be stolen. What's up with that?! (even though I type "http://www.orovalleyaz.gov" it gets changed to "https://www.orovalleyaz.gov" which is further confusing. Why is this site secured?)

(2) The blue note talks about a base rate increase from $2.90 per month to $4.50. Duh! This is over 55%! Wanna guess how much my social security has gone up in the past seven years? Don't guess, here's the answer:

January 2010 -- 0.0%
January 2011 -- 0.0%
January 2012 -- 3.6%
January 2013 -- 1.7%
January 2014 -- 1.5%
January 2015 -- 1.7%
January 2016 -- 0.0%

Three years - none! Three years less than 2%! One year less than 4%. That's a total of 8.5% over the last 7 years! And you're proposing 55%! Having been an OV resident for over 26 years, I think this is way outa line and needs to be re-reviewed. Of course, I haven't viewed the "analysis" since it's "hidden from view", but I still think this is a proposed "crime", especially considering that this is supposed to address "impact and cleanup of storm water runoff during and after rainfall events"* and we've been in a drought situation for the past 7 years! (meaning very little runoff to be taken care of) and does not address abatement construction (which should be taken from other taxes/fees).

Maybe I'll learn a little more after reviewing your "secret" document. I'm sorry I won't be able to attend your May 4th Public Hearing, but I wouldn't want to come with no details on this proposal, anyway.

Bob Owin
[redacted]

* taken from letter of March 13, 2008 from David B Parker to Tucson Water/Metro Water Customer

Ramsey, Aimee

From: CenturyLink Customer[redacted]
Sent: Tuesday, April 19, 2016 2:44 PM
To: Storm Water OV
Subject: Stormwater Utility rate increase

Follow Up Flag: Follow up
Flag Status: Flagged

To Whom it May Concern:

As a long time resident of Oro Valley (26 years), and a member of the nearby community since 1964, I am totally opposed to an increase in the Stormwater Utility rate of a whopping 55 percent. For those of us who live on a fixed income, this is an outrage. Nonetheless, I suspect when it comes to the Mayor and his cronies, any increase in taxes to the residents of Oro Valley is irrelevant, and they will do whatever they want regardless of what the people have to say.

Richard Gosla

Ramsey, Aimee

From:	[redacted]
Sent:	Tuesday, April 19, 2016 3:11 PM
To:	Storm Water OV
Subject:	Base Rate Increase for Residential Properties.
Follow Up Flag:	Follow up
Flag Status:	Flagged

To whom this may concern,

Upon receiving my latest Storm water bill from you folks, I notice the flyer which had been place in with the bill. This flyer notes that a rate increase on the Equivalent Residential Unit (ERU) from $2.90 to $4.50 which is about 64% increase from the current charge rate is being discuss at a Thursday (4/12) storm water utility commission meeting and then at a public meeting on Wednesday (5/4/16). I guess I'm dumb founded by this rate hike, because even with the $2.90 to ERU and a total of $8.70 I paid upon receipt I don't see results of these monies being used. I have been in Oro Valley since 1976, we have gone from a village I believe in 1976 to a town/city currently. So I'm asking given that you the council will see no problem with raising these rates, what is exactly these monies going to do for the current and future of Oro Valley?

Sincerely
Richard A. Yurmanovich

Ramsey, Aimee

From: [redacted] on behalf of Keith Donegan

Sent: Thursday, April 21, 2016 8:21 AM
To: Storm Water OV
Subject: Utility Rate Comment

As a resident and home owner of Oro Valley since the annex of Suffolk Hills, I have to strongly disagree with the proposed rate increase for storm water utility.

Please become more efficient with what you receive now, or make cuts.

Thank you for your time.

Ramsey, Aimee

To: [redacted]
Subject: RE: Base Rate Increase for Residential Properties.

From: [redacted]
Sent: Wednesday, April 20, 2016 3:34 PM
To: Ramsey, Aimee <aramsey@orovalleyaz.gov>
Subject: Re: Base Rate Increase for Residential Properties.

Good Afternoon Aimee,

First, let me start by thanking you for your immediate response to my e-mail below.

Second, given what I have read in your reply below I have a couple of questions I would like to pose to you - please see the following:

1.) Several years ago Oro Valley installed concrete curbs on the north side of our street, starting at the top and came down about 3/4 of the way. From that point to the bottom of our street (again the north side) they dump huge piles of rocks in the drainage ditch in front of the houses. Now that's all Oro Valley did, after years of run off from the monsoons along with the normal rain storms. Those piles of rocks ended up with large amount of debris gathering in those rock piles -whether it be dirt or dead vegetation, thus cause future water drainage to expand beyond the normal flow of the ditch area. Now to the best of my knowledge "NO" from Oro Valley knock on the individual homeowner door to explain what this was being done, along with what to do if as I noted previously if the water starts to erode into their front yard.

2.) I believe it was Two (2ea) year ago when we had those heavy rains during the Monsoon season in the month of August. Which for the most part expose a lot of utilities lines at the upper end of our street as well as rest of the Shadow Mountain Estates. Shortly afterwards a Oro Valley town engineer shows up at our front door to talk about the damage these rains had cause to our washes. When I questioned him on the time line for a response to cleaning up our washes, he believe this would happen in the next couple of months. Well, a long story short, this same engineer shows-up at my home about ten or eleven months later telling me that Oro Valley is going to start cleaning up the washes. To be perfectly honest with you/Aimee, there was "NO" reason for me to believe that this was going to actually happen. So the washes that runs through the back of my property, they basically ran a front end loader through the middle of the wash and cut some trees branches. I told this individual that if they felt that the many trees that in the wash and on my property needed to be remove to ensure better water flow for the future, you have my "OK" to remove them. Now to be perfectly honest with you/Aimee, from what I have seem I'm not impress with the work that was done.

So, I'm thinking what I have noted above falls into the category of the storm water. In closing, I want to thank you for your time and patience regarding my questions to this matter.

Sincerely
Richard A. Yurmanovich

Ms. Wendy L. Camp
[redacted]

4-20-16

Dear Oro Valley -

I and my late husband built our home 33 years ago. I do not live in a gated or golf community, nor do I have extra funds for lots of "wants." I cover the "needs."

I feel the increase of the current Storm Water Utility fee is <u>excessive</u>.

I remember complaints when it was started. "Double fee'd", as Pima Co. took out of our Prop. taxes for the same purpose.

A smaller amount perhaps, but to raise it an extra $1.60 a month is <u>wrong</u>.

P.S. I'm sure what I say won't matter, I felt I needed to speak.

Camp
[redacted]
Wendy Camp

Town of Oro Valley
Development and Infrastruture Services

Record of Comments - Stormwater Rate Analysis

Name/Address	Phone/Email	Comment	Staff Taking Call	Date	Would Like Call Back
Mr. Fauley		was concerned that the whole bill was increasing or just the SW fee by $1.60. Was provided an update an asssured the increase was $1.60 per month	Carmen Ryan	4/15/2016	Yes ☐
					No ■
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐
					Yes ☐
					No ☐

Please return once filled to Aimee Ramsey, Assistant Director. Or return by April 22, 2016

Town Council Regular Session **Item # 6.**

Meeting Date: 05/04/2016

Requested by: Stacey Lemos **Submitted By:** Stacey Lemos, Finance

Department: Finance

Information

SUBJECT:

DISCUSSION AND POSSIBLE ACTION REGARDING AN ENERGY EFFICIENCY IMPROVEMENT PROJECT AT THE ORO VALLEY COMMUNITY CENTER

RECOMMENDATION:

Staff recommends moving forward with the energy efficiency project at the Oro Valley Community Center following Option B, as outlined below, to include the replacement of aged HVAC units, evaporative coolers, lighting retrofits within the buildings and on the tennis courts, hot water heater replacements, pool heater and pump replacements, an irrigation system replacement and the installation of solar photovoltaic panels in the facility parking lot.

This is a comprehensive option that continues the Town's commitment to green building and energy efficiency. With the inclusion of the solar panels in this option, the Town continues its efforts in this area from the solar project completed on the Town Hall campus back in 2010, with the added side benefit of providing shade-covered parking for patrons and members at the Community Center, while offsetting a portion of the electricity needs of the facility.

EXECUTIVE SUMMARY:

Town staff has been working with Trane Energy Services and Controls (Trane) to evaluate the possibility of implementing an energy savings and efficiency project at the Oro Valley Community Center. Given that this facility is about 30 years old and has outdated systems, there is ample opportunity to achieve significant energy savings and efficiencies to cover the cost of this project over time. This would be a budget neutral project with no need for upfront funding from the Town whereby the improvements would be financed over a set period of time, and the energy savings from the project would be used to pay the financing costs of the project. This is similar in concept to the energy efficiency and solar project completed by the Town in 2010 for the Town Hall campus facilities.

Staff has asked Trane to prepare two project options for Town Council consideration based on a preliminary assessment of the property that included onsite property surveys

and review of past utility bills. The first option (Option A) consists of a project that includes the replacement of aged HVAC units, evaporative coolers, lighting retrofits within the buildings and throughout the 31 lighted tennis courts at both tennis locations, hot water heater replacements, pool heater and pump replacements and an irrigation pumping system replacement on the Conquistador golf course. This project is estimated to cost $1.6 million and generate annual savings of approximately $177,000 in water, gas, electric and maintenance costs.

The second option (Option B) consists of a project that includes all of the energy efficiency measures within Option A, plus the installation of solar photovoltaic panels over a reconfigured parking space layout in the Community Center parking lot. It is estimated that this project would cost $2.7 million and generate annual savings of approximately $211,000, including the offset of approximately 42% of the electricity needs of the Community Center with the solar panels.

Staff is asking for Council consideration and direction to move forward with either Option A or Option B this evening. Once direction is received, the Town will sign a Letter of Commitment with Trane to have them begin a more detailed energy analysis and investment grade audit in order to develop more accurate project specifications. As part of the more detailed analysis to come on this project, staff will research the merits of entering into a guaranteed performance energy contract with Trane, whereby the annual energy savings is guaranteed, otherwise Trane pays the Town the difference if the projected energy savings levels are not met.

BACKGROUND OR DETAILED INFORMATION:

Town staff has been working with Trane, the Town's current vendor for HVAC systems and maintenance, to evaluate the feasibility of implementing energy efficiency measures at the Oro Valley Community Center. Given that this facility is nearly 30 years old, many of the systems under consideration are past their useful lives and in need of replacement and upgrade. One of the goals of this project is to have it be 100% self-funded from beginning to end, with no up front capital cost required by the Town. In order to finance these improvements, the Town would look at various funding options to include low-interest bond financing, tax-exempt leases, and utility rebates from Tucson Electric Power and other utility providers. The annual energy savings from this project would be allocated toward paying off the financing of these improvements over a 10-16 year timeframe. Staff would ensure that the financing term of the improvements does not exceed the useful lives of these improvements. Moving forward with this project will allow the Town to invest in new, efficient infrastructure at the Community Center within existing budget capacity.

Attached to this Council Communication as Exhibit 1 is the Preliminary Assessment prepared by Trane which outlines Option A and Option B, as described above. This Exhibit provides greater detail into the various energy efficiency measures recommended, including the HVAC unit retrofit, lighting upgrades, pool system improvements, hot water heater replacements, irrigation pumping system replacement at the Conquistador golf course and the installation of solar photovoltaic parking structures.

The preliminary analysis shows the estimated annual electric, natural gas, water and maintenance savings for each measure, as well as the estimated project cost for each. This information will be refined during the investment grade energy audit process that will begin after staff receives Council direction this evening.

The energy efficiency measures being discussed with this project specifically relate to the Oro Valley Community Center. These would be funded entirely with energy savings budgeted within the Community Center Fund, and do not include any other Town locations or sites. It is the intent that this project would have no impact on the Town's General Fund. To consider improvements at other locations around Town would commingle project costs and savings from other Town funds, such as the General Fund. With the energy efficiency project that was completed in 2010, significant facility, lighting, solar and HVAC system upgrades were completed at that time, which have significantly reduced annual energy costs town-wide since then, leaving limited opportunities to achieve a return on investment sufficient enough to pay for additional improvements in these other areas.

It is important to note that if Council decides to move forward with either Option A or B, this would cause the Town to enter into a debt financing (either through the issuance of bonds, a tax-exempt lease or a combination of both) to pay for the proposed measures at the Community Center. This assumes that the Town will continue to own this facility at least throughout the financing term of either option. Should the Town decide to sell or cede ownership of all or a portion of this property before the debt financing is paid off, the Town may be obligated to pay off the debt early, which could negatively impact other funds of the Town.

In terms of next steps, if Council provides direction to move forward with this project, Trane will perform a detailed investment grade energy audit that could take up to a month to complete, staff will research in greater detail the financing options for this project, and a more complete project assessment will be prepared by Trane. This information, along with recommended financing options, will be presented to Council this summer with the goal of the project commencing shortly thereafter during the summer months. It is likely that the project construction phasing will begin with HVAC and evaporative cooler replacements, the irrigation pumping system replacement and the lighting retrofits, followed by the smaller measures, and will conclude with the installation of the solar panel parking structures to be installed on a reconfigured parking lot layout at the facility. It is anticipated that a more definitive project timeline will be developed over the next few months and will be presented to Council with the above-mentioned information.

FISCAL IMPACT:

In the two options provided by Trane, both options are cash flow positive in the first year as detailed in the last two pages of the attachment, Pro Forma - Option A and Pro Forma - Option B. That is, the estimated annual energy savings exceeds the estimated annual cost of financing the project. Option A illustrates the $1.6 million project cost being repaid within 10 years, with estimated annual energy and O&M savings of $177,000 in year 1 growing to over $229,000 in year 10 (see Total Annual Savings column in Pro Forma -

Option A).

Option B illustrates the $2.7 million project being repaid within 16 years, with estimated annual energy and O&M savings of $211,000 in year 1 growing to over $342,000 in year 16 (see Total Annual Savings column in Pro Forma - Option B). This longer payback term for Option B is consistent with the payback terms of the Town's existing Clean Renewal Energy Bonds that were issued in 2010 to finance the costs of the solar panel structures on the Town Hall campus. This payback term is expected due to the higher cost of the solar panel infrastructure; however, the useful life of the solar panel system is approximately 30 years, and the estimated annual net cash flow with Option B is higher than Option A.

It is anticipated that this project will not impact the Town's General Fund, will be 100% self-funded by the energy savings achieved within the Community Center Fund and will provide much-needed infrastructure improvements within the existing budget capacity of the Community Center Fund. It is important to note that these project expenses will be paid whether the project is approved or not by maintaining the current utility expenses. By replacing the aged equipment now through this self-funded structure, the Town will be able to avoid non-budgeted future capital costs to replace these items in the future.

SUGGESTED MOTION:

I MOVE to direct staff to proceed with an energy efficiency project at the Oro Valley Community Center following (Option A or Option B).

or

I MOVE to...

Attachments

Exhibit 1 - Preliminary Assessment

2016

PRELIMINARY ASSESSMENT

Zbuka, Jon

Trane Building Advantage

4/23/2016

ORO VALLEY, it's in our nature

EXECUTIVE SUMMARY

Trane is pleased to deliver this *Preliminary Assessment* to the **Town of Oro Valley**. Trane has conducted onsite surveys, reviewed utility bills (some were unavailable due to property ownership changes) and reviewed the current HVAC, Lighting, Pools Systems, Domestic Hot Water Heaters, Irrigation Pumping System and PV Solar Parking Structures at the Oro Valley Recreation Center. Using the available utility information, Energy Star Portfolio Manager and a Trace 700 energy model of the facility, the current Energy Utilization Index (EUI) of the facility was calculated to be 200,472 BTU/SQFT-YR. Comparing the existing EUI with other properties in the region, there appears to be a substantial opportunity to reduce energy consumption at the Oro Valley Recreation Center. Trane believes the project described below can reduce the current EUI from 200,472 BTU/SQFT-YR to 80,043 BTU/SQFT-YR.

The Energy Conservation Measures (ECMs) to reduce the overall energy consumption of the Oro Valley Recreation Center are outlined below and will be thoroughly evaluated during Trane's *Detailed Assessment* phase of the project.

Preliminary Project's Energy Saving Summary:

Option A Description	Water Total ($)	Electric Total ($)	Natural Gas Total ($)	Maintenance Savings Total ($)	Total Savings ($)	Project Cost ($)
Energy Conservation Measures	$90,000	$63,594	$12,974	$10,000	$176,568	$1,555,060

Option B Description	Water Total ($)	Electric Total ($)	Natural Gas Total ($)	Maintenance Savings Total ($)	Total Savings ($)	Project Cost ($)
Energy Conservation Measures	$90,000	$98,384	$12,974	$10,000	$211,359	$2,719,546

TRANE BUILDING ADVANTAGE

Trane has prepared two projects - Option A and Option B. Plan A includes HVAC, Lighting, Pools Systems, Domestic Hot Water Heaters and Irrigation Pumping System. Plan B includes the ECM's from Plan A with the addition of PV Solar Parking Structures. Trane estimates there is approximately $176,568 in energy and maintenance savings that could be realized with an investment of $1,555,060 in Option A. The estimates for Option B are approximately $211,359 in energy and maintenance savings that could be realized with an investment of $2,719,546. An itemized description of the individual ECMs are outline below.

ECM 1 - HVAC UNIT RETROFIT

Trane has performed an analysis of the existing HVAC systems, their application and method of control. We have determined that the existing units have all surpassed their industry standard life cycle and propose to replace each with higher efficiency models. We also recognize an opportunity to consolidate multiple small capacity units serving common areas, reconfigure constant volume air distribution to variable air flow, and institute a universal control approach to the facility as a whole, given its multi-functional applications and time schedules, driven by activities, occupancy (CO2), heat load, all with user (facility personnel) friendly flexibility.

The existing kitchen ventilation system is presently comprised of evaporative coolers, which are also beyond their life cycle and do not meet standards that the facility requires. We propose to install mechanical cooling units with ambient sub cooling and economizing capabilities.

HVAC Unit Retrofits - Energy Saving Summary:

Description	Electric Total ($)	Natural Gas Total ($)	Water Total ($)	Maintenance Total ($)	Total Savings ($)	Project Cost ($)
ECM 1 – HVAC Unit Retrofit	$30,133			$6,000	$36,133	$500,814

ECM 2 - LIGHTING UPGRADE

Trane has performed a lighting audit on the Community Center and Pusch Ridge interior lighting and tennis courts. The existing lighting is a combination of T-12 fluorescent, T-8 fluorescent and incandescent fixtures. The exterior lighting is HID and metal halide.

Lighting Upgrade - Energy Saving Summary:

Description	Electric Total ($)	Natural Gas Total ($)	Water Total ($)	Maintenance Total ($)	Total Savings ($)	Project Cost ($)
ECM 2 – Lighting Upgrade	$32,253			$4,000	$36,253	$547,761

ECM 3 - POOL SYSTEMS

We have audited the existing pool heaters and pumps and are proposing to replace the heaters with 94% efficiency gas fired heaters, the pumps with variable speed high efficiency replacements, and install automated pool covers on both pools which would provide insulation during the unoccupied periods, reduce evaporation in summer months and provide a barrier from dirt and airborne particulars in monsoons and haboobs.

Pool Systems - Energy Saving Summary:

Description	Electric Total ($)	Natural Gas Total ($)	Water Total ($)	Maintenance Total ($)	Total Savings ($)	Project Cost ($)
ECM 3 – Pool Systems		$12,240			$12,240	$71,394

ECM 4 - DOMESTIC HOT WATER HEATERS

The existing four (4) domestic hot water heaters have surpassed their life expectancy and given their usage we propose to install 95% efficient instantaneous type replacements that will respond to usage, but provide efficiency in unoccupied periods.

Domestic Hot Water Heaters - Energy Saving Summary:

Description	Electric Total ($)	Natural Gas Total ($)	Water Total ($)	Maintenance Total ($)	Total Savings ($)	Project Cost ($)
ECM 4 – Domestic Hot Water Heaters		$735			$735	$31,654

ECM 5 – Irrigation Pumping System

Furnish and install a replacement irrigation pump station at the northern location. Inclusive in the package are high efficiency motors, variable frequency drives, flow meter, and programmable logic controller with remote control management.

Irrigation Pumping System - Energy Saving Summary:

Description	Electric Total ($)	Natural Gas Total ($)	Water Total ($)	Maintenance Savings Total ($)	Total Savings ($)	Project Cost ($)
ECM 5 – Irrigation Pumping System	$1,209		$90,000		$91,209	$190,855

ECM 6 – PV Solar Parking Structure

Provide a complete turnkey installation of a 418.88 kW Solar Photovoltaic covered parking system at the Community Center.

PV Solar Parking Structure - Energy Saving Summary:

Description	Electric Total ($)	Natural Gas Total ($)	Water Total ($)	Maintenance Total ($)	Total Savings ($)	Project Cost ($)
ECM 6 – PV Solar Parking Structure	$34,790				$34,790	$1,164,486

PRO FORMA – OPTION A

Project Cost =	$1,555,060	Cost of Capital =	3.0%
Utility Rebates =	$46,222	Year 2-25 Utility Inflation Rate =	3.0%
First Cost =	$1,508,839	Term =	10
O&M Cost Avoidance (per year) =	$10,000	Equipment Useful Life =	20
New O&M Costs (per year) =	$0	O&M Yearly Inflation Rate =	2.0%

	Savings				Costs		Cash Flow	
CASH FLOW	Projected Energy Savings	O&M Cost Avoidance	Total Annual Savings	Cumulative Savings	Project Cost	Total Annual Costs	Annual Net Cash Flow	Cumulative Cash Flow
Year 1	$166,568	$10,000	$176,568		($176,431)	($176,431)	$137	$137
Year 2	$171,565	$10,200	$181,765	$358,333	($176,431)	($176,431)	$5,334	$5,472
Year 3	$176,712	$10,404	$187,116	$545,450	($176,431)	($176,431)	$10,685	$16,157
Year 4	$182,014	$10,612	$192,626	$738,075	($176,431)	($176,431)	$16,195	$32,352
Year 5	$187,474	$10,824	$198,298	$936,373	($176,431)	($176,431)	$21,867	$54,219
Year 6	$193,098	$11,041	$204,139	$1,140,512	($176,431)	($176,431)	$27,708	$81,927
Year 7	$198,891	$11,262	$210,153	$1,350,665	($176,431)	($176,431)	$33,722	$115,649
Year 8	$204,858	$11,487	$216,345	$1,567,010	($176,431)	($176,431)	$39,914	$155,563
Year 9	$211,004	$11,717	$222,720	$1,789,730	($176,431)	($176,431)	$46,289	$201,852
Year 10	$217,334	$11,951	$229,285	$2,019,015	($176,431)	($176,431)	$52,854	$254,706
Year 11	$223,854	$12,190	$236,044	$2,255,058	$0	$0	$236,044	$490,749
Year 12	$230,569	$12,434	$243,003	$2,498,061	$0	$0	$243,003	$733,752
Year 13	$237,486	$12,682	$250,169	$2,748,230	$0	$0	$250,169	$983,921
Year 14	$244,611	$12,936	$257,547	$3,005,777	$0	$0	$257,547	$1,241,468
Year 15	$251,949	$13,195	$265,144	$3,270,921	$0	$0	$265,144	$1,506,612
Year 16	$259,508	$13,459	$272,966	$3,543,888	$0	$0	$272,966	$1,779,579
Year 17	$267,293	$13,728	$281,021	$3,824,908	$0	$0	$281,021	$2,060,600
Year 18	$275,312	$14,002	$289,314	$4,114,223	$0	$0	$289,314	$2,349,914
Year 19	$283,571	$14,282	$297,854	$4,412,076	$0	$0	$297,854	$2,647,768
Year 20	$292,078	$14,568	$306,646	$4,718,723	$0	$0	$306,646	$2,954,414
Totals	$4,475,748.99	$242,973.70	$4,718,723		($1,764,308.78)	($1,764,309)	$2,954,414	

TRANE BUILDING ADVANTAGE

PRO FORMA – OPTION B

Project Cost =	$2,719,546	Cost of Capital =	3.0%
Utility Rebates =	$46,222	Year 2-25 Utility Inflation Rate =	3.0%
First Cost =	$2,673,325	Term =	16
O&M Cost Avoidance (per year) =	$10,000	Equipment Useful Life =	30
New O&M Costs (per year) =	$0	O&M Yearly Inflation Rate =	2.0%

	Savings				Costs		Cash Flow	
CASH FLOW	Projected Energy Savings	Solar Benefit	Total Annual Savings	Cumulative Savings	Project Cost	Total Annual Costs	Annual Net Cash Flow	Cumulative Cash Flow
Year 1	$176,568	$34,790	$211,359		($210,979)	($210,979)	$380	$380
Year 2	$181,865	$36,355	$218,221	$429,579	($210,979)	($210,979)	$7,242	$7,622
Year 3	$187,321	$37,990	$225,311	$654,890	($210,979)	($210,979)	$14,332	$21,954
Year 4	$192,941	$39,697	$232,638	$887,528	($210,979)	($210,979)	$21,659	$43,613
Year 5	$198,729	$41,480	$240,209	$1,127,737	($210,979)	($210,979)	$29,230	$72,842
Year 6	$204,691	$43,341	$248,032	$1,375,769	($210,979)	($210,979)	$37,053	$109,896
Year 7	$210,832	$45,286	$256,117	$1,631,886	($210,979)	($210,979)	$45,138	$155,034
Year 8	$217,157	$47,316	$264,472	$1,896,358	($210,979)	($210,979)	$53,494	$208,528
Year 9	$223,671	$49,436	$273,107	$2,169,466	($210,979)	($210,979)	$62,129	$270,656
Year 10	$230,381	$51,650	$282,032	$2,451,498	($210,979)	($210,979)	$71,053	$341,709
Year 11	$237,293	$53,962	$291,255	$2,742,753	($210,979)	($210,979)	$80,276	$421,986
Year 12	$244,412	$56,377	$300,789	$3,043,542	($210,979)	($210,979)	$89,810	$511,795
Year 13	$251,744	$58,898	$310,642	$3,354,184	($210,979)	($210,979)	$99,663	$611,458
Year 14	$259,296	$61,531	$320,827	$3,675,011	($210,979)	($210,979)	$109,848	$721,307
Year 15	$267,075	$64,280	$331,355	$4,006,366	($210,979)	($210,979)	$120,376	$841,683
Year 16	$275,087	$67,150	$342,238	$4,348,603	($210,979)	($210,979)	$131,259	$972,942
Year 17	$283,340	$70,148	$353,488	$4,702,091	$0	$0	$353,488	$1,326,429
Year 18	$291,840	$73,277	$365,117	$5,067,208	$0	$0	$365,117	$1,691,547
Year 19	$300,595	$76,545	$377,140	$5,444,349	$0	$0	$377,140	$2,068,687
Year 20	$309,613	$79,957	$389,570	$5,833,919	$0	$0	$389,570	$2,458,257
Year 21	$318,902	$83,519	$402,421	$6,236,340	$0	$0	$402,421	$2,860,679
Year 22	$328,469	$87,239	$415,708	$6,652,048	$0	$0	$415,708	$3,276,386
Year 23	$338,323	$91,123	$429,446	$7,081,494	$0	$0	$429,446	$3,705,832
Year 24	$348,473	$95,178	$443,650	$7,525,144	$0	$0	$443,650	$4,149,482
Year 25	$358,927	$99,411	$458,338	$7,983,482	$0	$0	$458,338	$4,607,820
Year 26	$369,695	$103,831	$473,526	$8,457,007	$0	$0	$473,526	$5,081,345
Year 27	$380,785	$108,446	$489,231	$8,946,238	$0	$0	$489,231	$5,570,577
Year 28	$392,209	$113,264	$505,473	$9,451,711	$0	$0	$505,473	$6,076,049
Year 29	$403,975	$118,294	$522,269	$9,973,980	$0	$0	$522,269	$6,598,318
Year 30	$416,094	$123,545	$539,639	$10,513,619	$0	$0	$539,639	$7,137,957
Totals	$8,400,304	$2,113,315	$10,513,619		($3,375,661.75)	($3,375,661.75)	$7,137,957	

TRANE BUILDING ADVANTAGE

Town Council Regular Session **Item # 7.**

Meeting Date: 05/04/2016

Requested by: Councilmember Zinkin & Councilmember Garner

Submitted By: Julie Bower, Town Clerk's Office

Department: Town Clerk's Office

Information

SUBJECT:

DISCUSSION AND POSSIBLE DIRECTION FOR A REQUEST FOR PROPOSALS TO SELECT A FIRM TO ASSIST WITH THE RECRUITMENT OF THE NEW TOWN MANAGER

RECOMMENDATION:

N/A

EXECUTIVE SUMMARY:

Councilmember Zinkin and Councilmember Garner have requested the item be placed on the agenda for discussion.

BACKGROUND OR DETAILED INFORMATION:

N/A

FISCAL IMPACT:

N/A

SUGGESTED MOTION:

I MOVE to _____

Attachments

No file(s) attached.