

City of Rockwall

Planning & Zoning Department
 385 S. Goliad Street
 Rockwall, Texas 75032
 (P): (972) 771-7745
 (W): www.rockwall.com

The City of Rockwall GIS maps are continually under development and therefore subject to change without notice. While we endeavor to provide timely and accurate information, we make no guarantees. The City of Rockwall makes no warranty, express or implied, including warranties of merchantability and fitness for a particular purpose. Use of the information is the sole responsibility of the user.

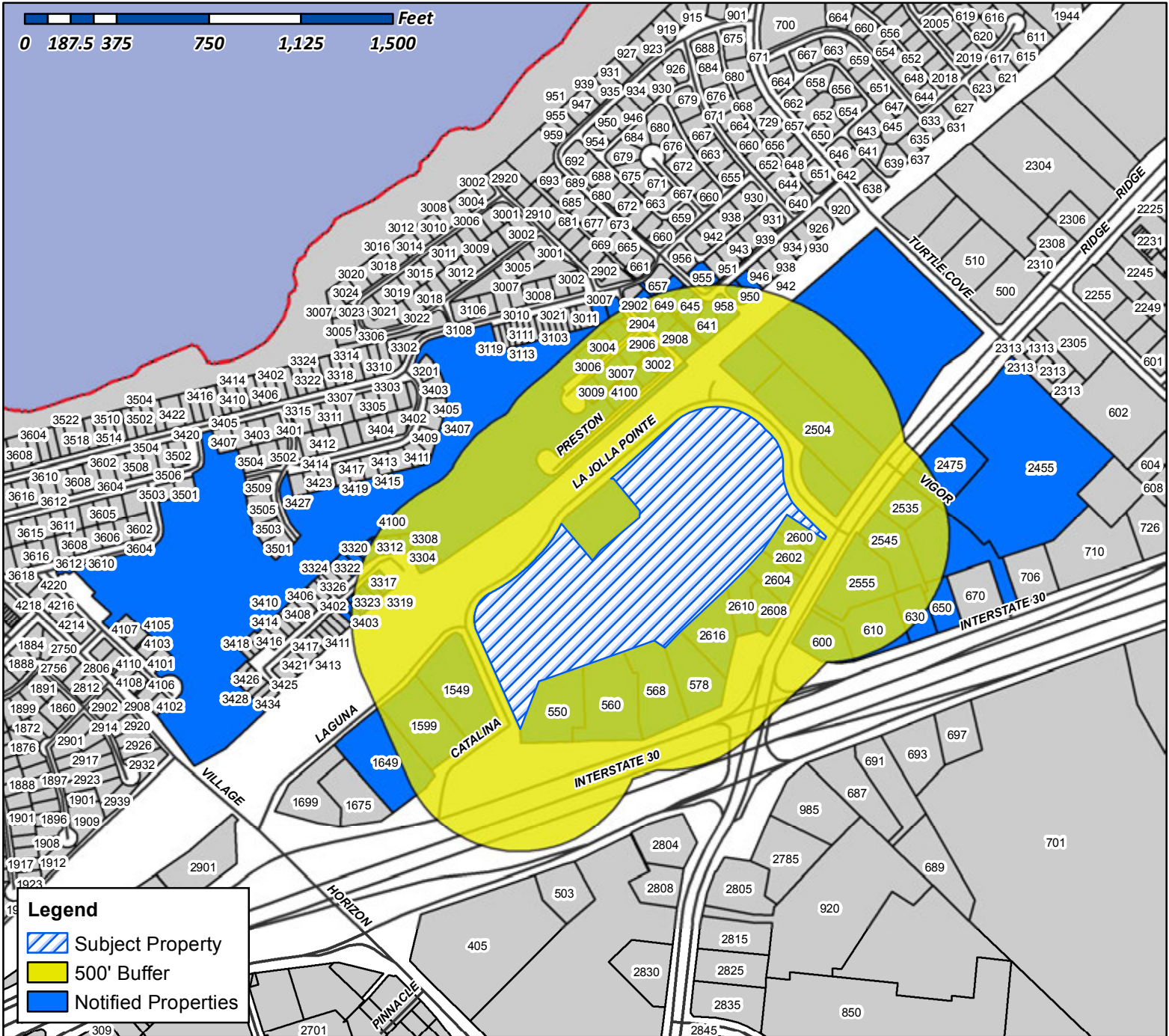




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Case Number: Z2016-042
Case Name: Davis Apartments at La Jolla Pointe
Case Type: Zoning
Zoning: Planned Development (PD) District
Case Address: Intersection of Laguna Drive and La Jolla Pointe

Date Created: 11/21/2016

For Questions on this Case Call (972) 771-7745



STEAK N SHAKE OPERATIONS INC
C/O THE STEAK N SHAKE COMPANY
107 S PENNSYLVANIA ST SUITE 400
INDIANAPOLIS, IN 46204

ROCKWALL MUSHROOM LLC
12 FAIRWAY DR
FRISCO, TX 75034

BOLD LLC
121 WYLER DR
DAKOTA, IL 61018

LANDRY'S RESTAURANTS INC
DBA SALTGRASS STEAKHOUSE
1510 WEST LOOP S
HOUSTON, TX 77027

PRICE JAMES
15330 LBJ FREEWAY STE 305
MESQUITE, TX 75150

CURRENT RESIDENT
1549 LAGUNA DR
ROCKWALL, TX 75087

CURRENT RESIDENT
1599 LAGUNA DR
ROCKWALL, TX 75087

COMPUTER SCIENCE INNOVATIONS LLC
16487 FREDERICK RD
WOODBINE, MD 21797

CURRENT RESIDENT
1649 LAGUNA DR
ROCKWALL, TX 75087

ASHTON CUSTER LLC
1800 VALLEY VIEW LN
FARMERS BRANCH, TX 75234

PREWITT LEE AND CONNIE
2010 PONTCHERTRAIN DR
ROCKWALL, TX 75087

HARRIS RICHARD DALE & JUDY A
210 GLENN AVE
ROCKWALL, TX 75087

MANGRIN CORPORATION
2255 RIDGE ROAD #208
ROCKWALL, TX 75087

CURRENT RESIDENT
2455 RIDGE RD
ROCKWALL, TX 75087

CURRENT RESIDENT
2475 RIDGE RD
ROCKWALL, TX 75087

BROOKS RICHARD L DR
2504 RIDGE RD STE 107
ROCKWALL, TX 75087

BROOKS RICHARD L MD
2504 RIDGE RD STE 101
ROCKWALL, TX 75087

CURRENT RESIDENT
2535 RIDGE RD
ROCKWALL, 75087

CURRENT RESIDENT
2545 RIDGE RD
ROCKWALL, TX 75087

CURRENT RESIDENT
2555 RIDGE RD
ROCKWALL, TX 75087

HANKINS NORMA A AND
MICA L MEYER
2571 VIVROUX RANCH RD
SEGUIN, TX 78155

BELAC PROPERTIES LLC
2600 RIDGE RD STE 102
ROCKWALL, TX 75087

CURRENT RESIDENT
2602 RIDGE RD
ROCKWALL, TX 75087

CURRENT RESIDENT
2604 RIDGE RD
ROCKWALL, TX 75087

CURRENT RESIDENT
2608 RIDGE RD
ROCKWALL, TX 75087

CURRENT RESIDENT
2610 RIDGE RD
ROCKWALL, TX 75087

CURRENT RESIDENT
2616 RIDGE RD
ROCKWALL, TX 75087

LINDEMAN JULIE A & BOBBY L
2902 PRESTON TRL
ROCKWALL, TX 75087

LEE JAMES H AND BARBARA
2904 PRESTON TR
ROCKWALL, TX 75087

CURRENT RESIDENT
2906 PRESTON TR
ROCKWALL, TX 75087

CURRENT RESIDENT
2908 PRESTON TR
ROCKWALL, TX 75087

EHLERT GORDON W & LINDA K
3001 PRESTON CT
ROCKWALL, TX 75087

CURRENT RESIDENT
3002 PRESTON TR
ROCKWALL, TX 75087

SALLS CAROL J
3002 PRESTON CT
ROCKWALL, TX 75087

CURRENT RESIDENT
3003 LAKESIDE DR
ROCKWALL, TX 75087

STURCH GARY D & CANDACE F
3003 PRESTON CT
ROCKWALL, TX 75087

MILLER KATHLEEN PALMER
3004 PRESTON CT
ROCKWALL, TX 75087

CURRENT RESIDENT
3005 PRESTON CT
ROCKWALL, TX 75087

HAMBLEY DAVID L JR & CAROL A
3006 PRESTON COURT
ROCKWALL, TX 75087

CHILDRESS DENNIS K JR & HILARY
3007 LAKESIDE DR
ROCKWALL, TX 75087

JOHNSON RAMONA
3007 PRESTON CT
ROCKWALL, TX 75087

ZUMWALT HAROLD J & VICKY
3009 PRESTON CT
ROCKWALL, TX 75087

NERKOWSKI FRANK A & PAMELA JO
3304 AUGUSTA BLVD
ROCKWALL, TX 75087

DANIELS BENNIE & GLORIA
3308 AUGUST BLVD
ROCKWALL, TX 75087

TARON MARK
3312 AUGUSTA BLVD
ROCKWALL, TX 75087

REED FRANCES GEAN
3316 AUGUSTA BLVD
ROCKWALL, TX 75087

ALLISON SHERRIE D
3317 AUGUSTA BLVD
ROCKWALL, TX 75087

BOBO LOUISE
3319 AUGUSTA BLVD
ROCKWALL, TX 75087

BOND PATRICIA A
3320 AUGUSTA BLVD
ROCKWALL, TX 75087

HOLLAND CHARLES A & BARBARA K
3321 AUGUSTA BLVD
ROCKWALL, TX 75087

SLOVAK PAMELA A
3322 AUGUSTA BLVD
ROCKWALL, TX 75087

CURRENT RESIDENT
3323 AUGUSTA BLVD
ROCKWALL, TX 75087

PARK PLACE REALTY & PROPERTY
MANAGEMENT LLC
3325 AUGUSTA BLVD
ROCKWALL, TX 75087

BRICENO KELLY M
3327 AUGUSTA BLVD
ROCKWALL, TX 75087

WILLMON KEVIN LEE
3329 AUGUSTA BLVD
ROCKWALL, TX 75087

VOHRA SURINDER L
C/O JULIA VOHRA
3401 AUGUSTA BLVD
ROCKWALL, TX 75087

ALLEN KIM L & LINDA
3510 LAKESIDE DR
ROCKWALL, TX 75087

ROBERTS JAMES F
3604 LAKESIDE DR
ROCKWALL, TX 75087

NOTY INVESTMENTS LLC
4001 BRIDGEPORT DR
PLANO, TX 75093

LAKESIDE VILLAGE HOMEOWNERS
4100 VILLAGE DR
ROCKWALL, TX 75087

ZAFAR PERRY AND
NASEEM JAMIL
4603 FOREST PARK ROAD
PLANO, TX 75024

CBAX PROPERTIES LLC
465 W PRESIDENT GEORGE BUSH HWY
RICHARDSON, TX 75080

CURRENT RESIDENT
550 I30
ROCKWALL, TX 75087

CURRENT RESIDENT
560 I30
ROCKWALL, TX 75087

CURRENT RESIDENT
568 I30
ROCKWALL, TX 75087

CURRENT RESIDENT
578 I30
ROCKWALL, TX 75087

ROCKWALL CORNER CORPORATION
600 E I-30
ROCKWALL, TX 75087

ROCKWALL RMKP LP
6005 SILVERLEAF LN
GARLAND, TX 75043

CURRENT RESIDENT
610 I30
ROCKWALL, TX 75087

CAMBRIDGE COURT LLC
6124 LA JOLLA MESA DR
LA JOLLA, CA 92037

RDF 188 30 & RIDGE ROCKWALL TX P1 LLC
620 E SOUTHLAKE BLVD
SOUTHLAKE, TX 76092

CURRENT RESIDENT
630 I 30
ROCKWALL, TX 75087

ZASTROW BRADLEY L & SANDRA D
641 CHANNEL RIDGE DR
ROCKWALL, TX 75087

JOHNSTON LISA P & MARK
645 CHANNEL RIDGE DR
ROCKWALL, TX 75087

SVRCEK JOSEPH T
649 CHANNEL RIDGE DR
ROCKWALL, TX 75087

PAUL'S KWIK KAR INC
650 E INTERSTATE 30
ROCKWALL, TX 75087

HYATT FAMILY TRUST
6525 NORTH FLY IN LAKE RD
ATHENS, TX 75751

MCCOY RAYMOND & BELVA
653 CHANNEL RIDGE DR
ROCKWALL, TX 75087

POP HOLDINGS LP
7750 N MACARTHUR BLVD STE 120-121
IRVING, TX 75063

AMM FA PROPERTIES LLC
8113 MUNICH DR
ROWLETT, TX 75089

DAVID HOGG BUILDING LLC
8652 W ROWEL RD
PEORIA, AZ 85383

ROCKWAY PARTNERS LLP
C/O JOHN HAMMERBECK
9071 E VASSAR AVE
DENVER, CO 80231

MIRANDA VINOD
9105 BRIARCREST DR
ROWLETT, TX 75089

MCDONALDS CORP (398/42)
C/O KEVA CHILDRESS
935 W RALPH HALL PKWY #101
ROCKWALL, TX 75032

SANDERS JOE D & JOLINDA
950 BRIAR OAK DR
ROCKWALL, TX 75087

MUNIZ SYLVIA D
954 BRIAR OAK DR
ROCKWALL, TX 75087

GERRALD SCOTT W & JUDY A
955 BRIAR OAK DR
ROCKWALL, TX 75087

DEEN LAUREN
958 BRIAR OAK DR
ROCKWALL, TX 75087

ROBERT H FAMILY TRUST AND BMK FIN CORP
AND
SHERRI LANE HEWETT AND SUSAN LYNNE
HEWETT LUCAS
C/O IHOP ATTN HAKIM REMA 5743
STONEGATE RD
DALLAS TX 75209

WENDY'S PROPERTIES LLC
C/O THE WENDY'S COMPANY
ONE DAVE THOMAS BLVD
DUBLIN, OH 43017

ROCKWALL OCEANHILL LLC
C/O GEORGE RAUST
PO BOX 1295
ROCKWALL, TX 75087

PASTEM CORP
PO BOX 600433
DALLAS, TX 75360

LANDAU PROPERTIES LP
PO BOX 601679
DALLAS, TX 75360

ROCKWALL II PROPERTIES LLC
PO BOX 630768
HOUSTON, TX 77263

WAFFLE HOUSE INC
ATTN: TAX DEPT
PO BOX 6450
NORCROSS, GA 30091

November 18, 2016

City of Rockwall - Planning and Zoning Department
Attention: Ryan Miller, AICP, Director of Planning
385 S. Goliad Street
Rockwall, Texas 75087

Re: Letter of Intent – 17.595 Acre Planned Development (Davis Apartments at La Jolla Pointe)

To Planning and Zoning Department:

Our Client, Davis Development, would like to formally submit an application for a 17.595 acre multi-family (MF) planned development (PD) in Rockwall. The subject property is bounded by La Jolla Pointe Drive on the north, east and west and is located on the north side of I-30 behind existing commercial development including the Mellow Mushroom, Logan's Roadhouse, Taco Cabana, Steak 'n Shake, IHOP among others. The 17.595 acre PD is proposed to include Lots 6 – 11, Block A of La Jolla Point Addition, Phase 2 (16.449 acres) and the proposed public right-of-way of Carmel Circle (1.146 acres). Carmel Circle was platted as a public right-of-way when the subject property was subdivided. We propose that Carmel Circle will be abandoned and included within the PD boundary. The subdivided lots (Lots 6-11) and Carmel Circle will be recombined during the platting process, after the zoning change process is complete.

The site is currently zoned Commercial (C), located in the IH-30 Overlay (IH-30 OV) and Scenic Overlay (SOV) Districts, and our Client requests that the site be rezoned as a Planned Development for multi-family use. The proposed PD will be developed in one (1) phase and consist of seven (7), 3-story/4-story split level buildings and one (1) 3-story building with approximately 272 total units. A leasing office, clubhouse and fitness area will also be included in the "L" shaped building located at the main entrance. The building mix chart that lists the approximate unit mix, unit size and overall building square footages, is shown on the PD Concept Plan attached with this letter. A mail kiosk, maintenance/car wash building and a pool amenity area are also proposed for the residents' use.

Attached with this letter are the following: (1) Check for \$464 for zoning change application fee, (2) Completed Development Application for zoning change, (3) Letter of Explanation Supporting Zoning Change (Rockwall Comp. Plan), (4) PD Development Standards, (5) Location Map with aerial photograph and PD Boundary Overlay, (6) Property Description of PD area, (7) PD Concept Plan, (8) Tree Survey, (9) TIA Report, and (10) Typical Building Elevations (colored) for city review and comment. Should you have any questions, please feel free to contact me at 972.620.1255, extension 6037.

Respectfully submitted,

Burgess & Niple, Inc.

TBPE FIRM REGISTRATION NO. F-10834



Benjamin Mikesell, P.E.

Project Manager

**DAVIS URBAN RESIDENTIAL AT LA JOLLA POINTE AND THE ROCKWALL
COMPREHENSIVE PLAN**

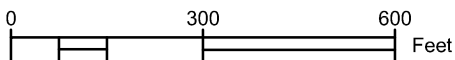
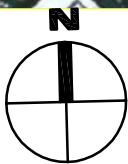
Support for the proposed zoning amendment for the Davis Urban Residential at La Jolla Pointe may be found under the City's Comprehensive Plan. The City's Future Land Use map designates the Property as "Commercial," with "Medium Density Single-Family Residential" to the north and west, and "Commercial" to the west, south and east along I-30. The "Commercial" future land use designation states that *(z)oning should only be allowed where the commercial use is eminent and where it would be planned and integrated with the adjacent residential neighborhoods*. The subject property is situated behind a row of retail buildings blocking the view of the site from the nearby major roadways. Further, access to the site from Ridge Road and the I-30 service road is limited and not ideal for a major retail development. Additionally, the topography of the site is not conducive for a retail development. Therefore, due to visibility, access and topography, retail is not eminent for the subject property..

The "Commercial" designation also sets forth the need for the commercial use to be "integrated with the adjacent residential neighborhoods." This policy is consistently reflected within the "Land Use Policies" of the Comprehensive Plan. Given the separation of the subject property from nearby residential uses by a railroad track, a commercial development on this property could not be integrated with the adjacent residential neighborhoods.

The proposed development does, however, satisfy further policies in the Comprehensive Plan that suggest a transition between the retail and the single-family homes to be accomplished through more condensed housing. For example, the land use policies in the Comprehensive Plan provide "general residential policies," which provide that "(h)igh density residential should be used as a transitional use from commercial (or existing retail) use, or where it will serve as a logical extension of an existing high density development." The addition of multi-family uses between the single family homes to the north and west of the Property and the commercial uses along I-30 would serve as this transition.

Another land use policy states that there should be a "blending of land uses that will result in a strong sense of community and neighborhood identity, and in the efficient use of land." As support for this policy, the Comprehensive Plan describes the current segregation of land uses in Rockwall, which "forces everyone to have to hop into a car, wind through a neighborhood and onto an already crowded arterial roadway to go even a few hundred feet away." The introduction of multifamily residential on the subject property provides a blend of horizontally mixed uses.

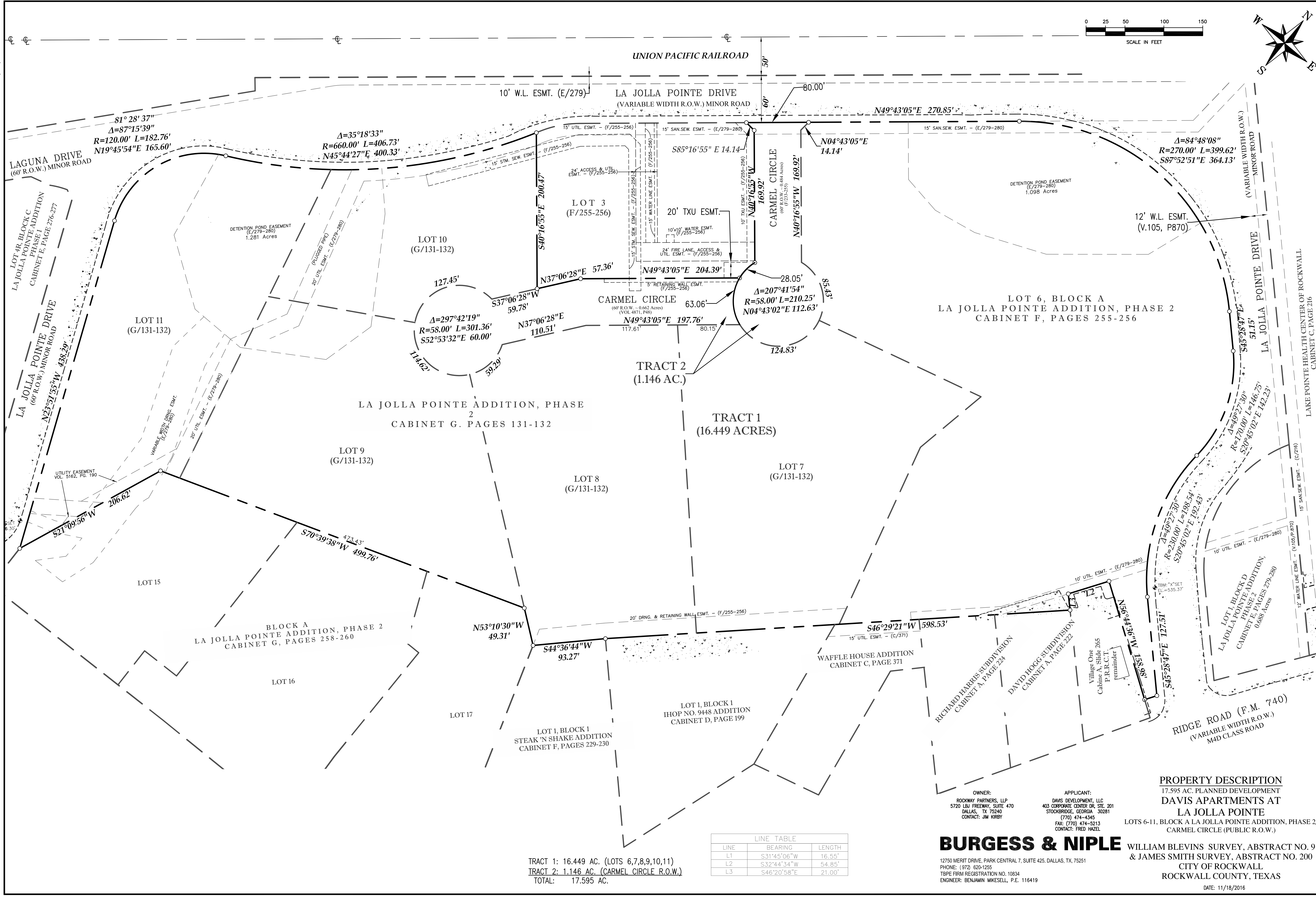
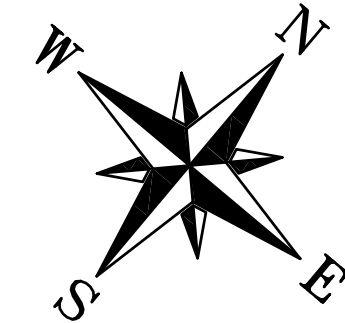
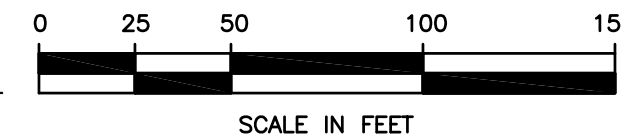
The land use policies also encourage the provision of a range of housing types to "accommodate different age groups, incomes and life styles," as well as to improve economic vitality. Specifically, "a greater variety of housing should be provided in specific areas of the city to accommodate a broad range of individual and family demand." Multifamily residential on the subject property would provide an additional choice of housing that could accommodate different age groups, incomes and life styles.



LOCATION MAP
 PLANNED DEVELOPMENT
 DAVIS APARTMENTS AT
 LA JOLLA POINTE

12750 Merit Dr., Ste. 425, Dallas, TX 75251 TBPE FIRM NO. 10834

BURGESS & NIPLE



TRACT 1: 16.449 AC. (LOTS 6,7,8,9,10,11)
TRACT 2: 1.146 AC. (CARMEL CIRCLE R.O.W.)
TOTAL: 17.595 AC.

LINE	BEARING	LENGTH
L1	S31°45'06"W	16.55'
L2	S32°44'34"W	54.85'
L3	S46°20'58"E	21.00'

OWNER:
ROCKWAY PARTNERS, LLP
5720 LBJ FREEMAN, SUITE 470
DALLAS, TX 75240
CONTACT: JIM KIRBY

APPLICANT:
DAVIS DEVELOPMENT, LLC
403 CORPORATE CENTER DR, STE 301
STOCKBRIDGE, GEORGIA 30281
(770) 474-4345
FAX: (770) 474-5213
CONTACT: FRED HAZEL

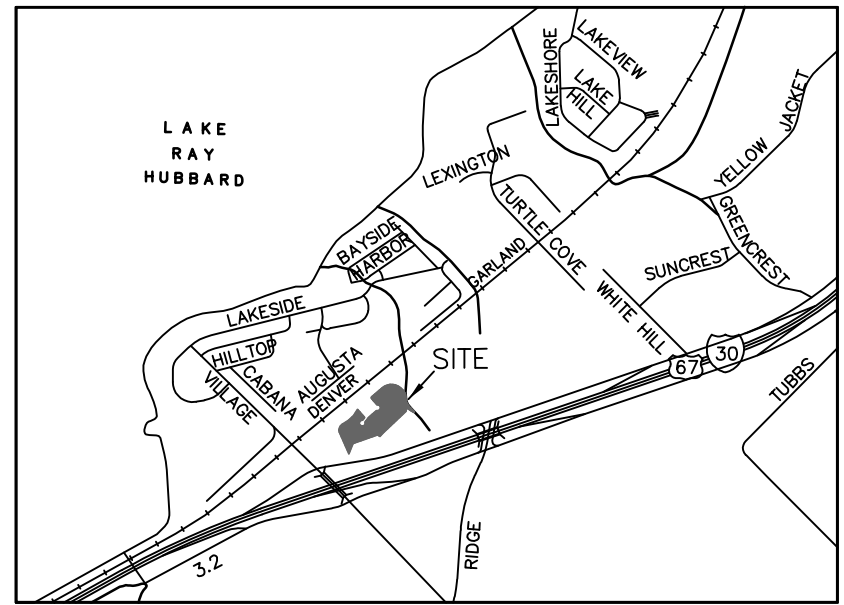
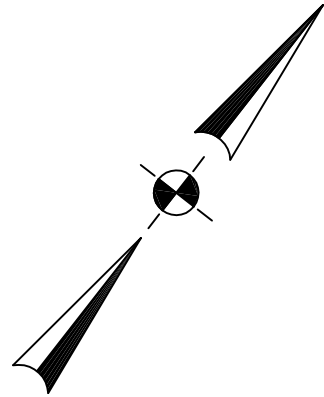
BURGESS & NIPLE

12750 MERIT DRIVE, PARK CENTRAL 7, SUITE 425, DALLAS, TX, 75251
PHONE: (972) 620-1255
TBPE FIRM REGISTRATION NO. 10834
ENGINEER: BENJAMIN MIKESSELL, P.E. 116419

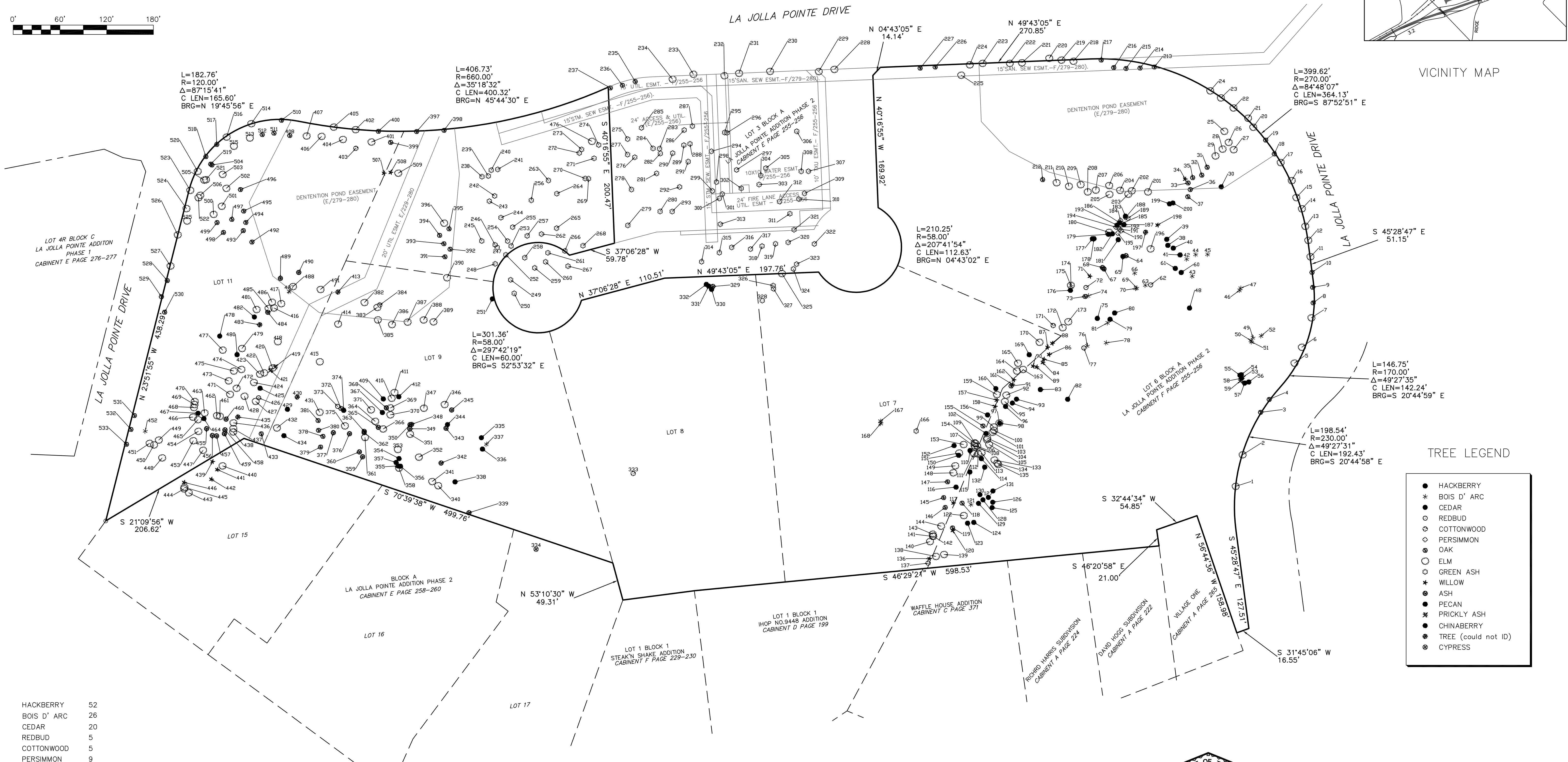
PROPERTY DESCRIPTION

17.595 AC. PLANNED DEVELOPMENT
DAVIS APARTMENTS AT
LA JOLLA POINTE
LOTS 6-11, BLOCK A LA JOLLA POINTE ADDITION, PHASE 2/
CARMEL CIRCLE (PUBLIC R.O.W.)

WILLIAM BLEVINS SURVEY, ABSTRACT NO. 9
& JAMES SMITH SURVEY, ABSTRACT NO. 200
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS



VICINITY MAP



TREE LEGEND

- HACKBERRY
- * BOIS D' ARC
- CEDAR
- REDBUD
- COTTONWOOD
- ◇ PERSIMMON
- OAK
- ELM
- GREEN ASH
- * WILLOW
- ASH
- PECAN
- * PRICKLY ASH
- CHINABERRY
- TREE (could not ID)
- CYPRESS

HACKBERRY	52
BOIS D' ARC	26
CEDAR	20
REDBUD	5
COTTONWOOD	5
PERSIMMON	9
OAK	69
ELM	190
GREEN ASH	90
WILLOW	23
ASH	28
PECAN	6
PRICKLY ASH	3
CHINABERRY	1
TREE	5
CYPRESS	1

BOUNDARY SURVEY BY OTHERS



RUDY RANGEL
TEXAS #PLS#5664

TREE SURVEY
LA JOLLA POINTE ADDITION, PHASE TWO
WILLIAM BLIEVINS SURVEY ABSTRACT NO. 9
JAMES SMITH SURVEY, ABSTRACT NO. 200

CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS.

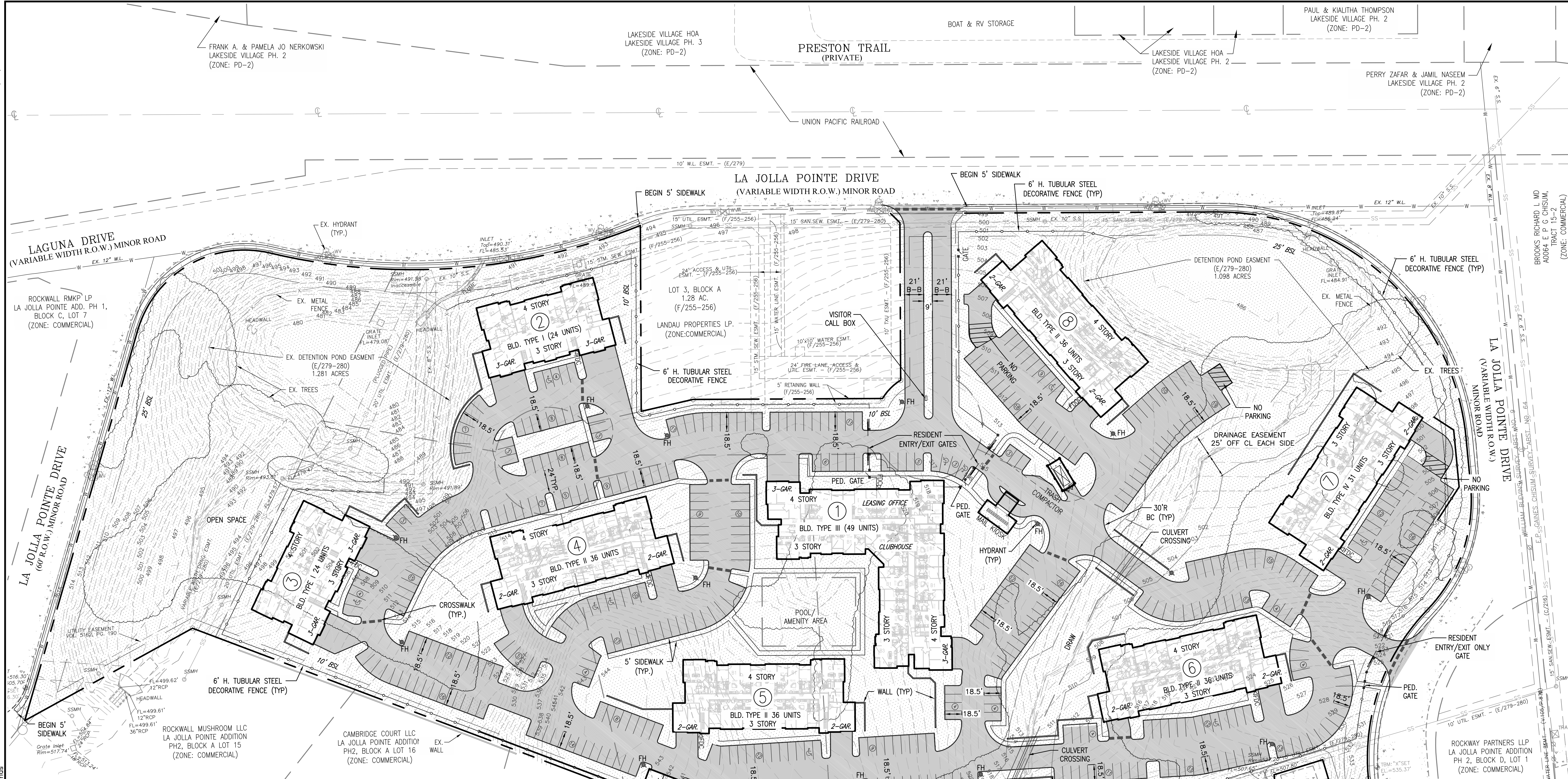
POINT	DESCRIPTION	POINT	DESCRIPTION	POINT	DESCRIPTION	POINT	DESCRIPTION	POINT	DESCRIPTION	POINT	DESCRIPTION
1	8" ELM	101	10" ELM	201	6" 4" ELM	301	12" GREEN ASH	401	8" ELM	501	10" ELM
2	6" ELM	102	12" HACKBERRY	202	4" ELM	302	12" GREEN ASH	402	10" ELM	502	10" ELM
3	4" OAK +	103	10" ELM	203	4" 4" ELM	303	12" GREEN ASH	403	6" COTTONWOOD	503	10" ELM
4	6" OAK	104	10" ELM	204	4" ELM +	304	12" GREEN ASH	404	12" ELM	504	6" 4" OAK
5	8" ELM	105	12" ELM	205	4" ELM	305	12" GREEN ASH	405	6" 10" ELM	505	6" ELM
6	10" ELM	106	4" ELM	206	4" ELM	306	12" 10" GREEN ASH	406	10" ELM	506	8" ELM
7	8" ELM	107	4" ELM	207	4" ELM	307	10" GREEN ASH	407	10" GREEN ASH	507	(14) 4" WILLOW
8	5" 4" 6" OAK	108	8" ELM	208	6" ELM	308	12" GREEN ASH	408	4" OAK	508	(4) 4" WILLOW
9	8" OAK	109	8" ELM	209	4" ELM	309	6" 10" GREEN ASH	409	10" HACKBERRY	509	10" 6" 8" ELM
10	8" OAK	110	8" HACKBERRY	210	4" ELM	310	6" GREEN ASH	410	4" ELM	510	4" OAK
11	8" ELM	111	8" ELM	211	4" ELM	311	10" GREEN ASH	411	12" ELM	511	6" OAK
12	8" ELM	112	6" ELM	212	4" OAK	312	12" GREEN ASH	412	6" 6" HACKBERRY	512	4" OAK
13	8" ELM	113	4" ELM	213	10" OAK	313	10" 10" GREEN ASH	413	6" 6" TREE	513	8" ELM
14	6" 8" ELM	114	12" HACKBERRY	214	8" OAK	314	8" 8" GREEN ASH	414	36" ELM	514	8" ELM
15	10" ELM	115	30" PECAN	215	10" OAK	315	10" GREEN ASH	415	36" ELM	515	8" ELM
16	8" ELM	116	8" HACKBERRY	216	8" OAK	316	12" GREEN ASH	416	6" ELM	516	4" 4" 4" ELM
17	8" ELM	117	4" WILLOW	217	8" OAK	317	8" 8" GREEN ASH	417	12" ELM	517	8" OAK
18	6" 4" OAK +	118	15" OAK	218	8" 4" ELM	318	8" 6" GREEN ASH	418	3" ELM	518	8" OAK
19	4" OAK +	119	8" OAK	219	8" 6" ELM	319	10" GREEN ASH	419	4" 4" PRICKLY ASH	519	6" 4" OAK
20	12" ELM	120	10" WILLOW	220	6" 6" ELM	320	10" GREEN ASH	420	4" ELM	520	8" ELM
21	6" ELM	121	8" BOIS D' ARC	221	6" ELM	321	8" GREEN ASH	421	4" PRICKLY ASH	521	6" ELM
22	8" ELM	122	8" ELM	222	4" 4" ELM	322	10" GREEN ASH	422	10" ELM	522	6" ELM
23	8" 4" ELM	123	12" HACKBERRY	223	6" ELM	323	8" GREEN ASH	423	4" ELM	523	4" ELM
24	10" ELM	124	12" 10" HACKBERRY	224	4" ELM	324	10" GREEN ASH	424	4" ELM	524	8" ELM
25	4" 8" ELM	125	8" CEDAR	225	6" ELM +	325	6" ELM	425	4" HACKBERRY	525	6" ELM
26	4" ELM	126	26" CEDAR	226	4" OAK	326	8" GREEN ASH	426	4" REDBUD +	526	8" ELM
27	10" ELM	127	15" CEDAR	227	4" OAK	327	10" GREEN ASH	427	6" ELM	527	6" ELM
28	6" ELM	128	10" CEDAR	228	8" ELM +	328	8" GREEN ASH	428	4" ELM	528	10" OAK
29	6" ELM	129	10" CEDAR	229	5" ELM +	329	12" GREEN ASH	429	24" PECAN	529	10" OAK
30	36" D'AN	130	4" 6" CEDAR	230	4" ELM	330	5" HACKBERRY	430	6" TREE	530	10" OAK
31	4" 4" OAK 4+	131	12" 6" CEDAR	231	4" ELM	331	4" HACKBERRY	431	15" 15" ELM	531	8" OAK
32	4" OAK 4+	132	10" HACKBERRY	232	4" ELM	332	4" HACKBERRY	432	6" 4" ELM	532	6" 6" OAK
33	6" OAK	133	8" ELM	233	4" ELM	333	12" 12" COTTONWOOD	433	8" OAK	533	8" OAK
34	4" 4" 4" WILLOW	134	8" ELM	234	8" ELM	334	4" BALD CYPREES	434	42" PECAN		
35	6" OAK	135	12" ELM	235	8" OAK +	335	10" CEDAR	435	4" TREE		
36	4" 4" 4" OAK	136	6" WILLOW	236	4" 4" OAK	336	4" 4" 4" HACKBERRY	436	6" ELM		
37	10" OAK	137	12" COTTONWOOD	237	10" OAK	337	4" 4" 4" BOIS D' ARC	437	6" ELM		
38	8" 8" HACKBERRY	138	10" ELM	238	12" GREEN ASH	338	10" 8" HACKBERRY	438	4" ELM		
39	24" HACKBERRY	139	4" ELM	239	12" GREEN ASH	339	10" 12" 12" GREEN ASH	439	4" 6" WILLOW		
40	12" HACKBERRY	140	10" ELM	240	12" 8" GREEN ASH	340	10" ELM	440	4" ELM		
41	12" HACKBERRY	141	12" ELM	241	15" GREEN ASH	341	10" ELM	441	6" WILLOW		
42	6" 6" 8" 6" BOIS D' ARC	142	10" 8" 6" ELM	242	8" 10" GREEN ASH	342	18" GREEN ASH	442	6" 8" WILLOW		
43	12" BOIS D' ARC	143	15" ELM	243	10" GREEN ASH	343	10" GREEN ASH	443	4" ELM		
44	4" 4" 4" 4" 4" BOIS D' ARC	144	4" 4" 4" ELM	244	10" GREEN ASH	344	15" CEDAR	444	4" ELM		
45	8" 8" BOIS D' ARC	145	15" OAK	245	10" GREEN ASH	345	12" GREEN ASH	445	6" ELM		
46	12" BOIS D' ARC	146	12" OAK	246	10" GREEN ASH	346	10" 10" ELM	446	8" 4" WILLOW		
47	12" BOIS D' ARC	147	12" OAK	247	12" GREEN ASH	347	6" ELM	447	10" 8" ELM		
48	12" 12" HACKBERRY	148	12" 12" ELM	248	12" GREEN ASH	348	10" GREEN ASH	448	40" ELM		
49	10" BOIS D' ARC	149	10" ELM	249	15" GREEN ASH	349	10" 8" 6" GREEN ASH	449	40" ELM		
50	12" BOIS D' ARC	150	6" HACKBERRY	250	12" GREEN ASH	350	10" 12" 8" GREEN ASH	450	4" ELM		
51	12" BOIS D' ARC	151	10" ELM	251	4" CEDAR	351	6" ELM	451	8" ELM		
52	18" 6" BOIS D' ARC	152	10" HACKBERRY	252	8" 10" GREEN ASH	352	8" ELM	452	8" BOIS D' ARC		
53	12" 18" BOIS D' ARC	153	4" ELM	253	10" GREEN ASH	353	6" 8" ELM	453	8" 8" ELM		
54	4" HACKBERRY	154	4" ELM	254	12" GREEN ASH	354	6" 6" 6" HACKBERRY	454	8" 8" 4" ELM		
55	4" HACKBERRY	155	12" OAK	255	15" GREEN ASH	355	6" HACKBERRY	455	6" 6" GREEN ASH		
56	4" HACKBERRY	156	10" HACKBERRY	256	10" GREEN ASH	356	4" 6" HACKBERRY	456	6" GREEN ASH		
57	10" HACKBERRY	157	12" WILLOW	257	12" GREEN ASH	357	4" 6" HACKBERRY	457	8" GREEN ASH		
58	6" CEDAR	158	12" WILLOW	258	12" GREEN ASH	358	6" 6" ELM	458	8" GREEN ASH		
59	4" PRICKLY ASH	159	10" ELM	259	15" GREEN ASH	359	12" GREEN ASH	459	6" 6" GREEN ASH		
60	12" HACKBERRY	160	12" CEDAR	260	12" GREEN ASH	360	12" GREEN ASH	460	6" 6" GREEN ASH		
61	10" HACKBERRY	161	15" WILLOW	261	12" GREEN ASH	361	6" ELM	461	8" ELM		
62	4" REDBUD +	162	6" WILLOW	262	10" 8" GREEN ASH	362	6" GREEN ASH	462	8" 6" ELM		
63	4" BOIS D' ARC	163	12" 12" ELM	263	8" GREEN ASH	363	8" GREEN ASH	463	4" ELM		
64	10" GREEN ASH	164	12" ELM	264	4" 12" GREEN ASH	364	6" 6" 4" ELM	464	10" 8" HACKBERRY		
65	8" HACKBERRY	165	24" ELM	265	12" GREEN ASH	365	4" GREEN ASH	465	8" ELM		
66	10" 10" 12" BOIS D' ARC	166	12" 12" GREEN ASH	266	10" GREEN ASH	366	8" 15" ELM	466	8" ELM		
67	4" GREEN ASH	167	6" BOIS D' ARC +	267	12" GREEN ASH	367	6" 6" 6" HACKBERRY	467	12" 8" HACKBERRY		
68	4" GREEN ASH	168	8" BOIS D' ARC +	268	14" GREEN ASH	368	4" GREEN ASH	468	10" ELM		
69	4" BOIS D' ARC	169	10" HACKBERRY	269	12" GREEN ASH	369	8" ELM	469	12" ELM		
70	4" BOIS D' ARC	170	12" ELM	270	14" GREEN ASH	370	12" ELM	470	18" ELM		
71	12" WILLOW	171	36" COTTONWOOD	271	12" GREEN ASH	371	8" ELM	471	36" ELM		
72	8" REDBUD	172	15" ELM	272	12" GREEN ASH	372	15" OAK	472	12" ELM		
73	18" OAK	173	15" ELM	273	12" GREEN ASH	373	8" REDBUD	473	12" ELM		
74	24" 10" BOIS D' ARC	174	12" 12" BOIS D' ARC	274	14" GREEN ASH	374	8" HACH	474	12" ELM		
75	4" HACKBERRY	175	24" ELM	275	12" 12" GREEN ASH	375	10" ELM	475	12" ELM		
76	18" 8" 10" BOIS D' ARC	176	10" HACKBERRY	276	12" GREEN ASH	376	15" GREEN ASH	476	8" ELM		
77	6" 6" REDBUD	177	12" 10" HACKBERRY	277	12" GREEN ASH	377	15" GREEN ASH	477	15" ELM		
78	6" 6" BOIS D' ARC	178	10" HACKBERRY	278	12" GREEN ASH	378	15" OAK	478	4" CEDAR		
79	4" HACKBERRY	179	6" 8" HACKBERRY	279	14" GREEN ASH	379	15" OAK	479	4" ELM		
80	4" HACKBERRY	180	8" ELM	280	14" GREEN ASH	380	6" OAK	480	6" HACKBERRY		
81	4" 4" BOIS D' ARC	181	8" HACKBERRY	281	10" 8" GREEN ASH	381	15" OAK	481	12" ELM		
82	24" 24" PECAN	182	12" 6" HACKBERRY	282	10" 8" 8" GREEN ASH	382	10" ELM	482	12" CEDAR		
83	18" HACKBERRY	183	6" CEDAR	283	8" GREEN ASH	383	8" ELM	483	4" TREE		
84	12" 15" WILLOW	184	6" PERSIMMON	284	12" GREEN ASH	384	8" COTTONWOOD	484	4" GREEN ASH		
85	12" WILLOW	185	6" PERSIMMON	285	4" 5" 6" GREEN ASH	385	8" ELM	485	12" ELM		
86	6" WILLOW	186	10" PECAN	286	12" GREEN ASH	386	4" ELM	486	18" ELM		
87	6" WILLOW	187	12" HACKBERRY	287	12" GREEN ASH	387	4" 4" ELM	487	18" 18" BOIS D' ARCH		
88	4" WILLOW	188	6" PERSIMMON	288	12" GREEN ASH	388	4" ELM	488	6" ELM		
89	6" WILLOW	189	4" PERSIMMON	289	12" GREEN ASH	389	4" ELM	489	12" GREEN ASH		
90	12" WILLOW	190	4" PERSIMMON	290	8" GREEN ASH	390	4" ELM	490	18" GREEN ASH		
91	10" OAK	191	4" PERSIMMON	291	12" GREEN ASH	391	12" GREEN ASH	491	36" ELM		
92	8" ELM	192	4" PERSIMMON	292	12" GREEN ASH	392	4" OAK	492	4" OAK		
93	18" CEDAR	193	4" CEDAR	293	12" GREEN ASH	393	4" OAK	493	4" OAK		
94	10" CEDAR	194	6" PERSIMMON	294	12" GREEN ASH	394	6" OAK	494	4" OAK		
95	10" ELM	195	4" PERSIMMON	295	12" GREEN ASH	395	6" OAK	495	4" OAK		
96	15" CEDAR	196	8" ELM	296	12" GREEN ASH	396	4" ELM	496	4" 4" OAK		
97	10" 10" ELM	197	4" TREE	297	10" GREEN ASH	397	10" OAK	497	4" 4" OAK		
98	6" CEDAR	198	6" WILLOW	298	8" GREEN ASH	398	4" OAK	498	4" 4" OAK		
99	6" ELM	199	4" HACKBERRY +	299	8" GREEN ASH	399	6" OAK	499	6" OAK		
100	10" ELM	200	4" 4" CHINABERRY	300	8" GREEN ASH	400	4" 6" OAK	500	10" ELM		

Notes:
+ / (X) Tree Protected: the diameter of a multi-trunk tree shall be determined by adding the total diameter of the largest trunk at DBH to one-half the diameter of each additional trunk.

TREE SURVEY
LA JOLLA POINTE ADDITION, PHASE TWO
WILLIAM BLIEVINS SURVEY ABSTRACT NO. 9
JAMES SMITH SURVEY, ABSTRACT NO.200

CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS.

RANGEL LAND SURVEYING 1012 TIMBERLINE DR. HEATH, TEXAS 75032 RANGELANDSURVEY@GWBELL.NET 214-325-8026 T.B.P.L.S. NO. 10077180	DATE: 03-23-2016 JOB NO.
---	--------------------------------



Davis Development					
UNIT NAME	UNIT TYPE	NET AREA(SF)	UNIT COUNT	PERCENTAGE	TOTAL AREA
A1	1br/1ba	667	33	12.13%	22,011
A2	1br/1ba	804	4	1.47%	3,216
A3	1br/1ba	816	39	14.34%	31,824
A3-ALT	1br/1ba	833	20	7.35%	16,660
A4	1br/1den/1ba	975	21	7.72%	20,475
B1	2br/2ba	1,083	79	29.04%	85,557
B2	2br/2ba	1,175	8	2.94%	9,400
B3	2br/2ba	1,245	33	12.13%	41,085
C1	3br/3ba	1,445	35	12.87%	50,575
TOTALS			272	100.00%	280,803

UNIT TABULATION
4,516

UNIT AVERAGE NET SF: 1,032.36

* NET AREA IS COMPUTED TO INCLUDE SQUARE FOOTAGE FROM EXTERIOR FACE OF ALL EXTERIOR FRAME WALLS THAT ENCLOSE A/C SPACE. IT DOES NOT INCLUDE PATIOS, BALCONIES, PATIO/BALCONY STORAGE.

UNIT AVERAGE NET SF: 1,032.36 S.F.

SITE DATA
PD AREA: 17,595 ACRES
LOTS 6-11 BLOCK A: 16,449 AC.
CARMEL CIRCLE ROW: 1,146 AC.

EX. ZONING: COMMERCIAL (C), SCENIC OVERLAY, I-30 OVERLAY
PROPOSED ZONING: PLANNED DEVELOPMENT

EX. USE: VACANT
PROPOSED USE: MULTI-FAMILY RESIDENTIAL

PROPOSED UNITS: 272
FLOOR AREA RATIO: 0.4 (BUILDING SF/ LOT SF)
MAX. BUILDING COVERAGE: 45% (15% PROVIDED)

MIN. OPEN SPACE: 20% (±58% PROVIDED)

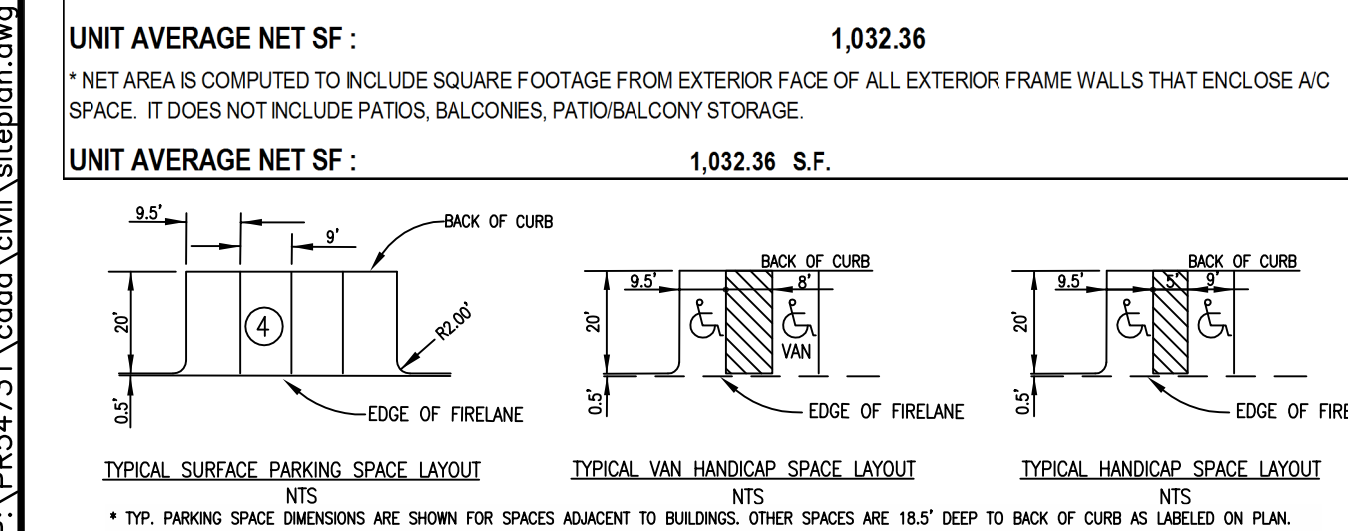
PARKING REQUIRED:
1 BDRM UNITS (117 X 1.5) = 176 SPACES
2 BDRM UNITS (120 X 2.0) = 240 SPACES
3 BDRM UNITS (35 X 2.5) = 88 SPACES

TOTAL PARKING SPACES REQUIRED = 504 SPACES (1.85 SPACES/UNIT)
(OF WHICH 2% MUST BE HC ACCESSIBLE SPACES, I.E. 11 SPACES)

TOTAL PARKING PROVIDED:
SURFACE: 482 SPACES
ATTACHED GARAGES: 38
TOTAL SPACES PROVIDED = 520 SPACES (1.91 SPACES/UNIT)
(OF WHICH 11 ARE HC ACCESSIBLE)

NOTES

- SURVEY DATA SHOWN IS BASED ON ALTA/ACSM LAND TITLE SURVEY FOR "LA JOLLA POINTE ADDITION, PHASE TWO" BY ARTHUR SURVEYING CO., INC. DATED 7/13/2015.
- PER SURVEY, ELEVATIONS AND CONTOURS SHOWN ARE BASED ON THE CITY OF ROCKWALL GIS NETWORK, MONUMENT NUMBER R005-1. ELEVATION = 578.63'.
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- ALL PARKING ADJACENT TO ANY BUILDING IS 20'x9' MINIMUM. OTHER PARKING SPACES ARE 18'x9' WITH A CLEAR TWO FOOT OVERHANG AND 4' CLEAR FROM ANY LANDSCAPING.
- ALL FIRE LANE CURB RETURN RADI ARE 30' UNLESS OTHERWISE NOTED.



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NOTES

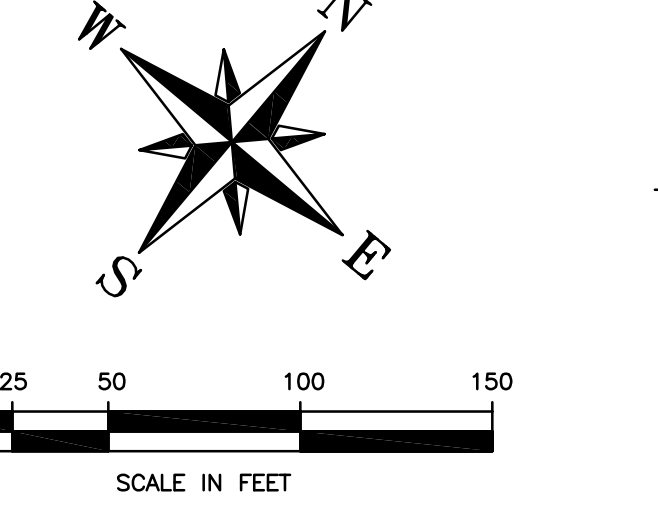
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NOVEMBER 18, 2016
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BURGESS & NIPLE

12750 MERIT DRIVE, PARK CENTRAL 7, SUITE 425, DALLAS, TX 75251
PHONE: (972) 620-1255
TBPE FIRM REGISTRATION NO. 10834
ENGINEER: BENJAMIN MIKESELL, P.E. 116419

PD CONCEPT PLAN

DAVIS APARTMENTS AT LA JOLLA POINTE

LOTS 6-11, BLOCK A LA JOLLA POINTE ADDITION, PHASE 2 AND CARMEL CIRCLE (PUBLIC R.O.W.)

WILLIAM BLEVINS SURVEY, ABSTRACT NO. 9 & JAMES SMITH SURVEY, ABSTRACT NO. 200
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
CASE NO. Z2016-011
DATE: 11/18/2016

**TRAFFIC IMPACT ANALYSIS FOR
DAVIS APARTMENTS AT LA JOLLA POINTE
ROCKWALL, TEXAS**

Prepared for:
Davis Development
17304 Preston Road, Suite 700
Dallas, Texas 75252

Prepared by:



LEE ENGINEERING

3030 LBJ Freeway, Suite 1660
Dallas, Texas 75234
(972) 248-3006
TBPE Firm F-450

April 2016



Joshua D. Smith
4-5-16

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INTRODUCTION

This traffic study was conducted to analyze the potential traffic impacts of the proposed Davis Apartments at La Jolla Pointe, in Rockwall, Texas. The development will be bounded by La Jolla Pointe Drive on the north, east and west and will be located on the north side of I-30 behind existing commercial development. A vicinity map of the study area is shown in **Figure 1** and a site plan is shown in **Figure 2**. The following elements were included in this study:

Data Collection

- Collected the AM and PM peak hour turning movement volumes at the following intersections
 1. Ridge Road at La Jolla Pointe Drive
 2. Catalina Drive at I-30 Westbound Frontage Road
 3. Laguna Drive at La Jolla Pointe Drive
 4. Village Drive at Laguna Drive
 5. Village Drive at I-30 Westbound Frontage Road
 6. Horizon Road at I-30 Eastbound Frontage Road
- Obtained the proposed site plan, information related to planned roadway improvements, and other relevant information.

Traffic Analysis

- Assessed the general accessibility of the site.
- Estimated the number of trips that will be generated by the proposed development.
- Estimated the directional distribution of traffic approaching / departing the proposed development.
- Assigned the estimated traffic to the street network.
- Performed capacity analyses for the critical intersections within the study area.
- Analyzed the impact of the proposed development on the area roadways.

Recommendations

- Determined if any roadway improvements are needed to accommodate projected traffic generated by the proposed development.

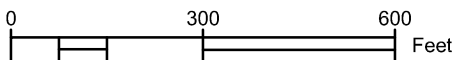
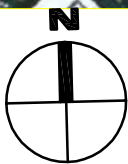
Documentation

- Prepared a report documenting the study procedures and results.

Figure 1

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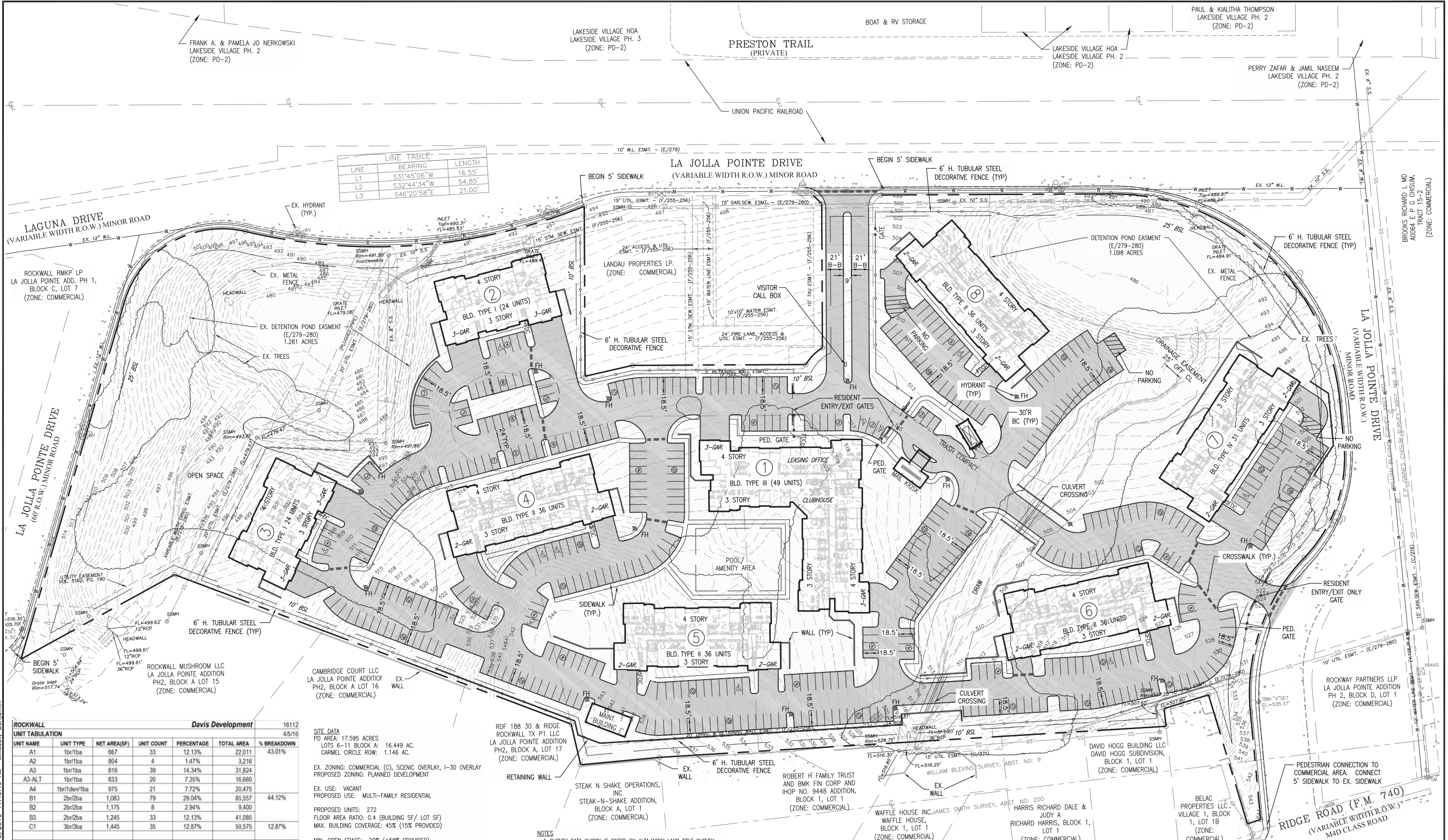
LOCATION MAP
 PLANNED DEVELOPMENT
 DAVIS APARTMENTS AT
 LA JOLLA POINTE

12750 Merit Dr., Ste. 425, Dallas, TX 75251 TBPE FIRM NO. 10834

BURGESS & NIPLE

PLOTTED: 4/5/2016 11:49:59 AM

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LINE	BEARING	LENGTH
L1	S31°45'06"W	16.55'
L2	S32°44'34"W	54.85'
L3	S46°20'58"E	21.00'

ROCKWALL UNIT TABULATION						
UNIT NAME	UNIT TYPE	NET AREA(SF)	UNIT COUNT	PERCENTAGE	TOTAL AREA	% BREAKDOWN
A1	1br/1ba	667	33	12.13%	22,011	43.01%
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TOTALS			272	100.00%	280,803	100%

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MAX. BUILDING COVERAGE: 45% (15% PROVIDED)

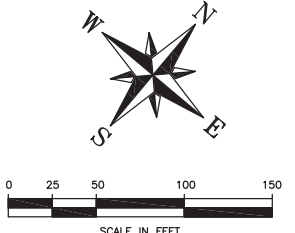
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TOTAL PARKING SPACES REQUIRED = 504 SPACES (1.85 SPACES/UNIT)
 (OF WHICH 2% MUST BE HC ACCESSIBLE SPACES, I.E. 11 SPACES)

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 SURFACE: 482 SPACES
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 PHONE: (972) 620-1255
 TPBE FIRM REGISTRATION NO. 10834
 ENGINEER: BENJAMIN MIKESELL, P.E. 116419

OWNER:
 ROCKWAY PARTNERS, LLP
 5720 LBJ FREEWAY, SUITE 470
 DALLAS, TX 75240
 (972) 661-2145
 CONTACT: JIM KIRBY

APPLICANT:
 DAVIS DEVELOPMENT, LLC
 403 CORPORATE CENTER DR. STE. 201
 STOCKBRIDGE, GEORGIA 30281
 (770) 474-4345
 FAX: (770) 474-5213
 CONTACT: FRED HAZEL

PD CONCEPT PLAN
DAVIS APARTMENTS AT LA JOLLA POINTE
 LOTS 6-11, BLOCK A LA JOLLA POINTE ADDITION, PHASE 2 AND CARMEL CIRCLE (PUBLIC R.O.W.)

WILLIAM BLEVINS SURVEY, ABSTRACT NO. 9 & JAMES SMITH SURVEY, ABSTRACT NO. 200
 CITY OF ROCKWALL
 ROCKWALL COUNTY, TEXAS
CASE NO. Z2016-011
 DATE: 4/5/2016

SITE ACCESSIBILITY

Site accessibility describes the ease with which vehicles can get to and from a development. A site's accessibility is affected by the geographical location of the development with respect to other activity areas, the roadway system, and physical restraints such as rivers or lakes.

The proposed development will be located in the empty tract south, east and west of La Jolla Pointe Drive and north of existing commercial development in Rockwall, Texas. Access to the facility will be provided by two full access driveways along La Jolla Pointe Drive, one approximately 900 feet northeast of Laguna Drive and another approximately 185 feet northwest of Ridge Road.

The existing and proposed lane configurations for these roadways and the critical intersections within the study area are provided in **Figure 3** and **Figure 4**. Note the lane configurations in each figure are identical except for the new turning movements to and from the proposed apartment driveway intersections.

A description of the study area roadways includes:

Interstate Highway 30 (I-30) – I-30 is located south of the proposed facility and is an east-west, six-lane freeway with one-way frontage roads. The speed limit on the I-30 main-lanes is 60 miles per hour (mph). The I-30 westbound frontage road (WBFR) is located south of the proposed site. It is a two-lane, one-way roadway with a posted speed of 45 mph. The I-30 eastbound frontage road (EBFR) is a two-lane, one-way roadway. No speed limit on the I-30 EBFR was found near the study area. The study assumes a 45 mph speed limit for the I-30 EBFR.

Ridge Road – Ridge Road is located southeast of the proposed facility and is a five-lane undivided roadway with a two-way center left turn lane and a posted speed limit of 45 mph. La Jolla Pointe Drive has its southeastern terminus at Ridge Road. At its southwestern terminus, it changes alignment to the west and becomes Catalina Drive southeast of existing commercial development.

La Jolla Pointe Drive – La Jolla Pointe Drive is a loop located east, west and north of the proposed facility and is a two-lane undivided roadway with a posted speed limit of 30 mph. Its 40-foot wide cross-section, unstriped except for a double yellow centerline, allows for future conversion to a 4-lane undivided roadway or a two-lane undivided roadway with on-street parking. La Jolla Pointe Drive tees into Ridge Road at one end and continues as Laguna Drive west of Catalina Drive.

Catalina Drive – Catalina Drive is located east of the proposed facility and is a two-lane undivided roadway with a posted speed limit of 30 mph. Catalina Drive runs a short distance of only about 450 feet from the I-30 WBFR at its southwest end end to La Jolla Pointe Drive on the east.

Figure 3

Existing Lane Configuration

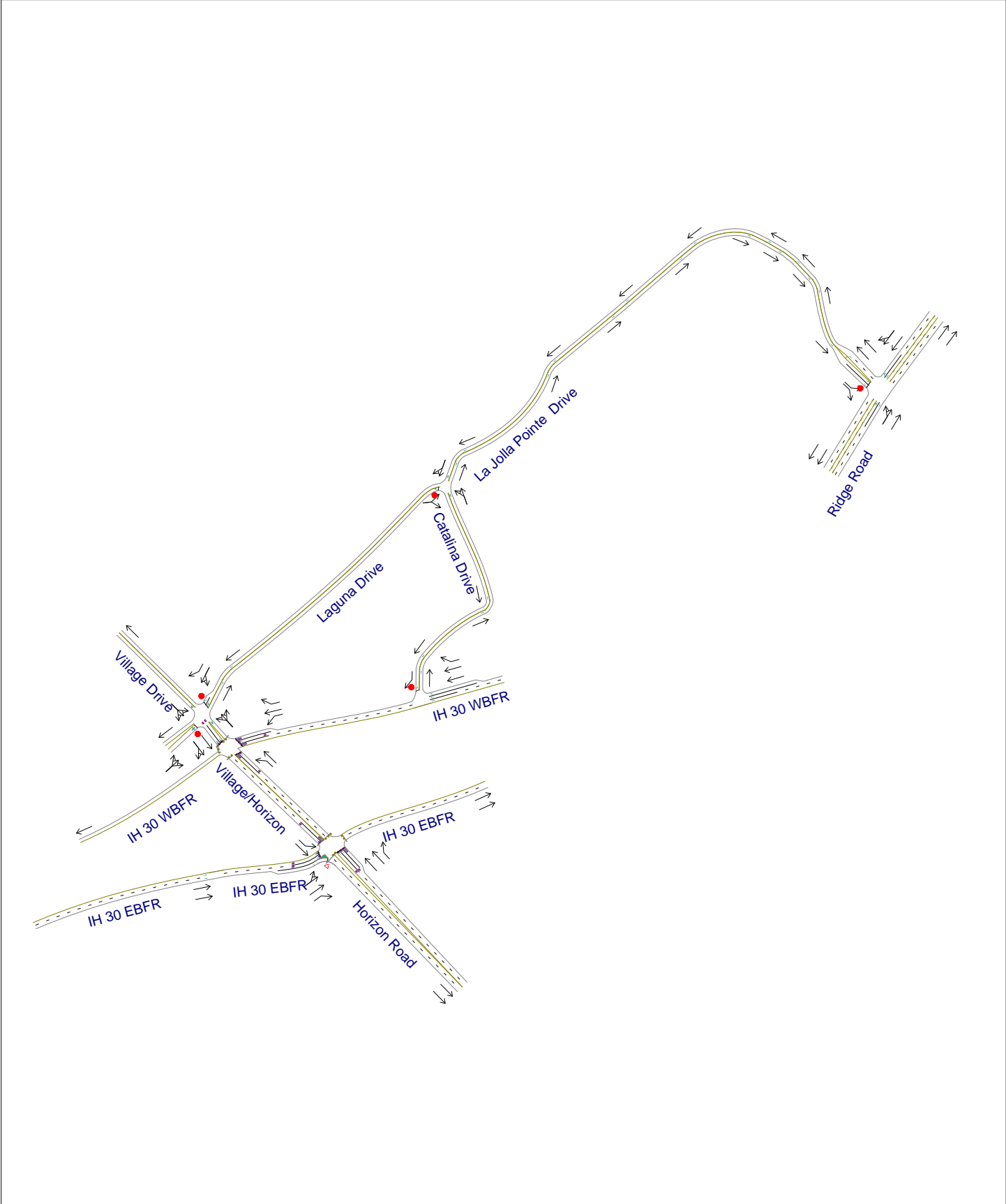
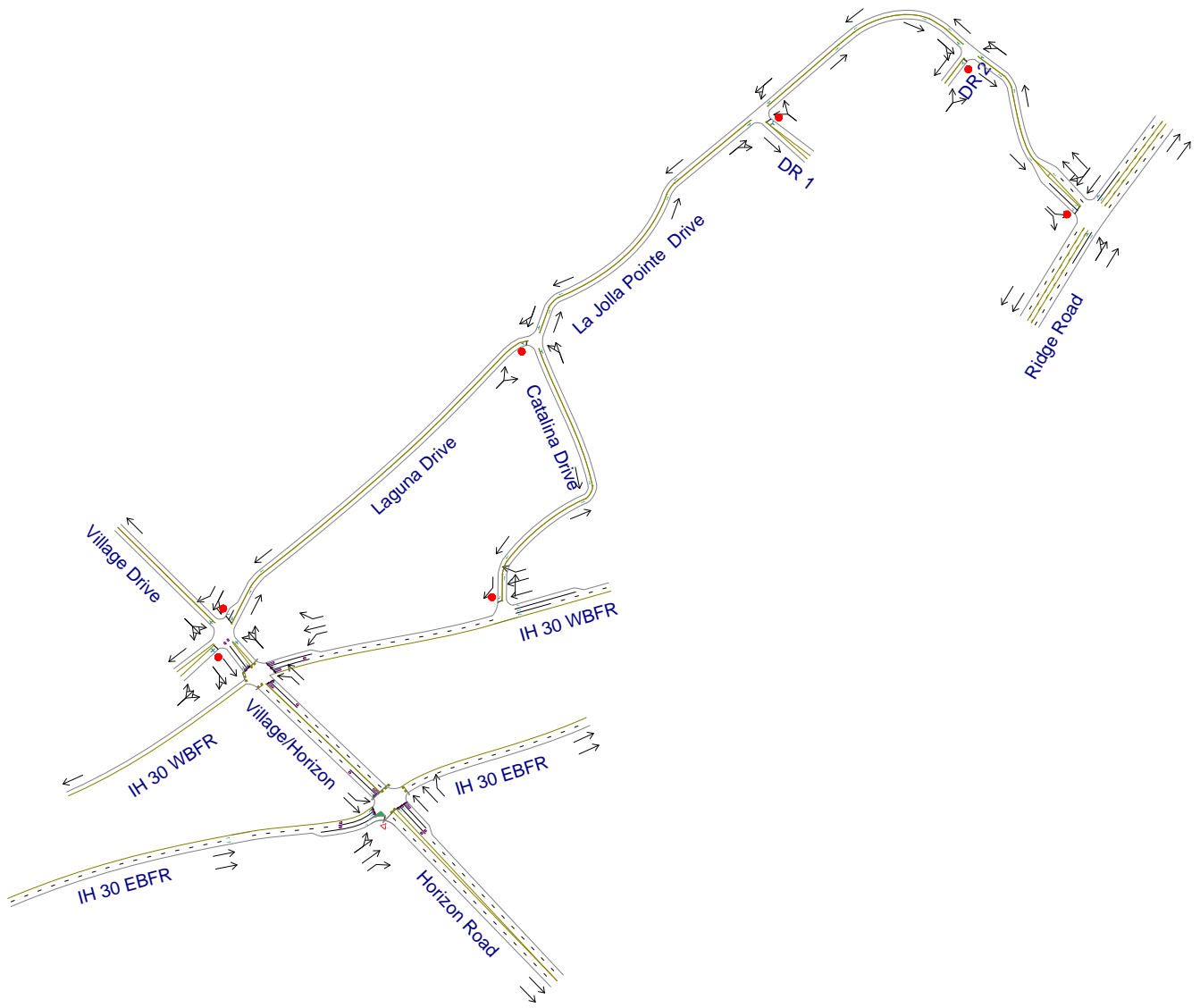


Figure 4

Proposed Lane Configuration



Laguna Drive – Laguna Drive is located west of La Jolla Pointe Drive and is a two-lane undivided roadway with a prima-fascia speed limit of 30 mph. Laguna Drive intersects with Village Drive at its western end and with La Jolla Pointe Drive at its eastern end.

Village Drive/Horizon Road – Village Drive is located west of the proposed facility and is a two-lane undivided roadway with a posted speed limit of 20 mph. South of I-30, Village Drive becomes Horizon Road. Horizon Road is a four-lane undivided roadway with a posted speed limit of 40 mph.

PROPOSED DEVELOPMENT

The proposed Davis Apartments are planned to consist of a 272 dwelling units (DU). The build-out year of proposed site is assumed to be 2017.

The number of trips generated by the facility is a function of the type and quantity of land use for the development. The number of vehicle trips generated by the proposed development was estimated based on the trip generation rates and equations provided in the publication entitled *Trip Generation, Ninth Edition*, by the Institute of Transportation Engineers (ITE). Estimates of the number of trips generated by the site were made for the AM and PM peak hour, as well as on a daily basis. The trip generation rates and the directional splits for this development are shown in **Table 1** and **Table 2**. Additionally, **Table 3** presents the number of trips generated by the proposed development at build-out.

Table 1: Trip Generation Rates

Land Use		Rates ¹		
Description	ITE Code	Average Weekday	AM Peak Hour	PM Peak Hour
Apartments	220	$T = 6.06*(X)+123.56$	$T = 0.49*(X)+3.73$	$T = 0.55*(X)+17.65$

¹T = Trips Ends; X = Number of DU

Table 2: Directional Splits

Land Use		Directional Split ¹		
Description	ITE Code	Average Weekday	AM Peak Hour	PM Peak Hour
Apartments	220	50 / 50	20 / 80	65 / 35

¹XX / YY = % entering vehicles / % exiting vehicles

Table 3: Estimated Trip Generation

Land Use	Variable ¹	Average Weekday			AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out	Total	In	Out
Apartments	220	1,772	886	886	138	28	110	168	109	59

¹DU

TRAFFIC VOLUMES

Existing Traffic Volumes

AM and PM peak hour turning movement volumes were collected at the study intersections from 6:30 to 8:30 AM and 4:30 to 6:30 PM on Tuesday, March 15, 2016. **Figure 5** and **Figure 6** show the existing (2016) peak hour traffic volumes at these intersections. The raw traffic count data is provided in the Appendix.

Background Traffic Volumes

The growth rate for the background traffic volumes was estimated based on the historical 24-hour traffic volumes in the area from TxDOT traffic count maps. **Table 4** summarizes the historical traffic volumes on area roadways.

Table 4: Historical Traffic Counts

Year	Location
	FM 740 S of IH 30
2009	26,000
2010	21,000
2011	16,700
2012	14,000
2013	20,841
2014	21,648
Average Growth	-4.0%

The traffic volumes in Table 4 show that traffic on the area roadways has decreased at an annual rate of 4% within the previous five year period. An annual growth rate of two percent (2%) was used for determining traffic conditions in the Build-Out Year (2017) and Horizon Year (2022). This is a conservative assumption. No growth was assumed for traffic to and from Village Road north of I-30 as this area is fully developed.

The Build-Out Year (2017) Background traffic volumes at the study intersections are provided in **Figure 7** and **Figure 8**. The Horizon Year (2022) Background traffic volumes at the study intersections are shown in **Figure 9** and **Figure 10**.

Figure 5

Existing AM Peak Hour Traffic Volumes

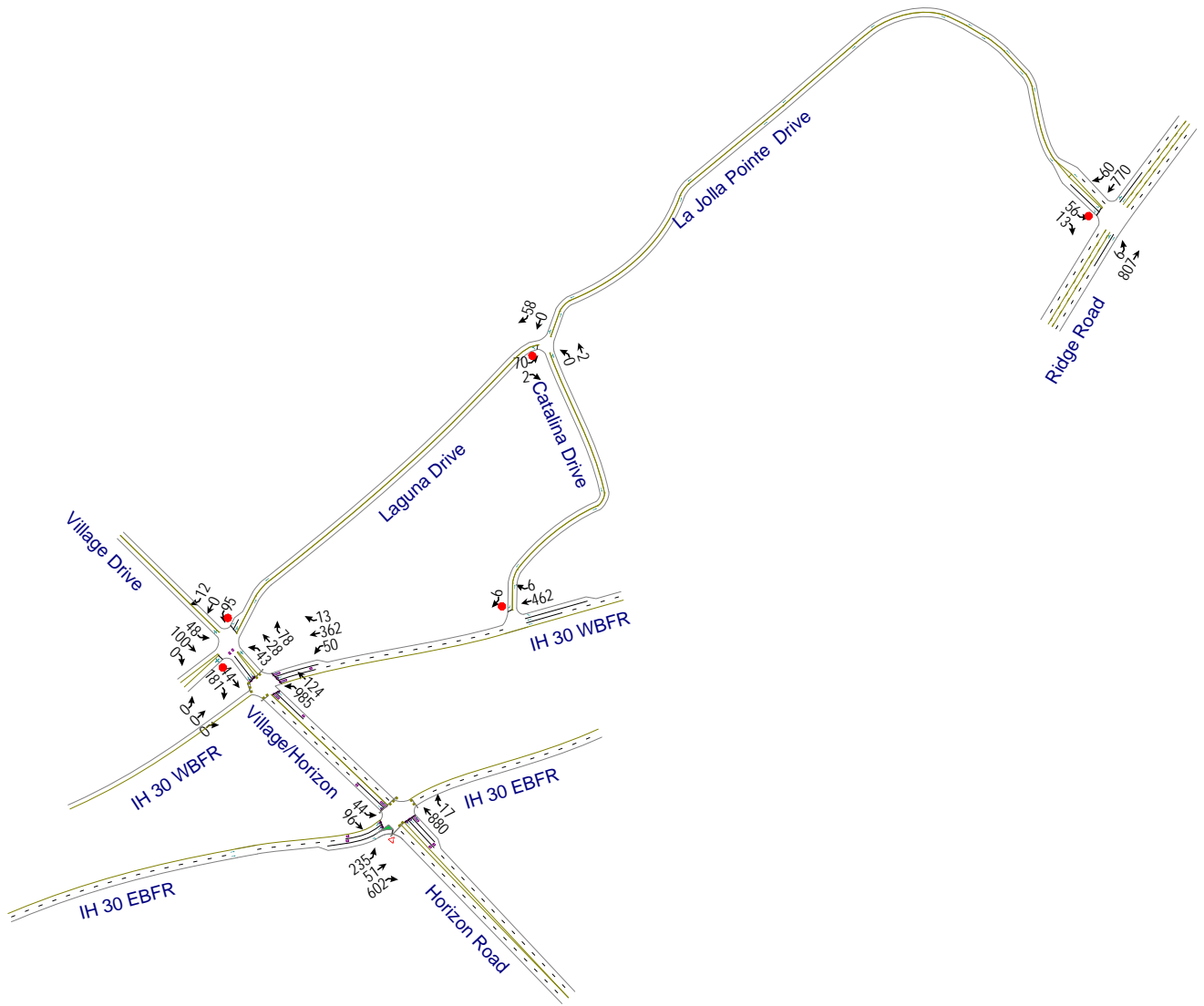


Figure 6

Existing PM Peak Hour Traffic Volumes

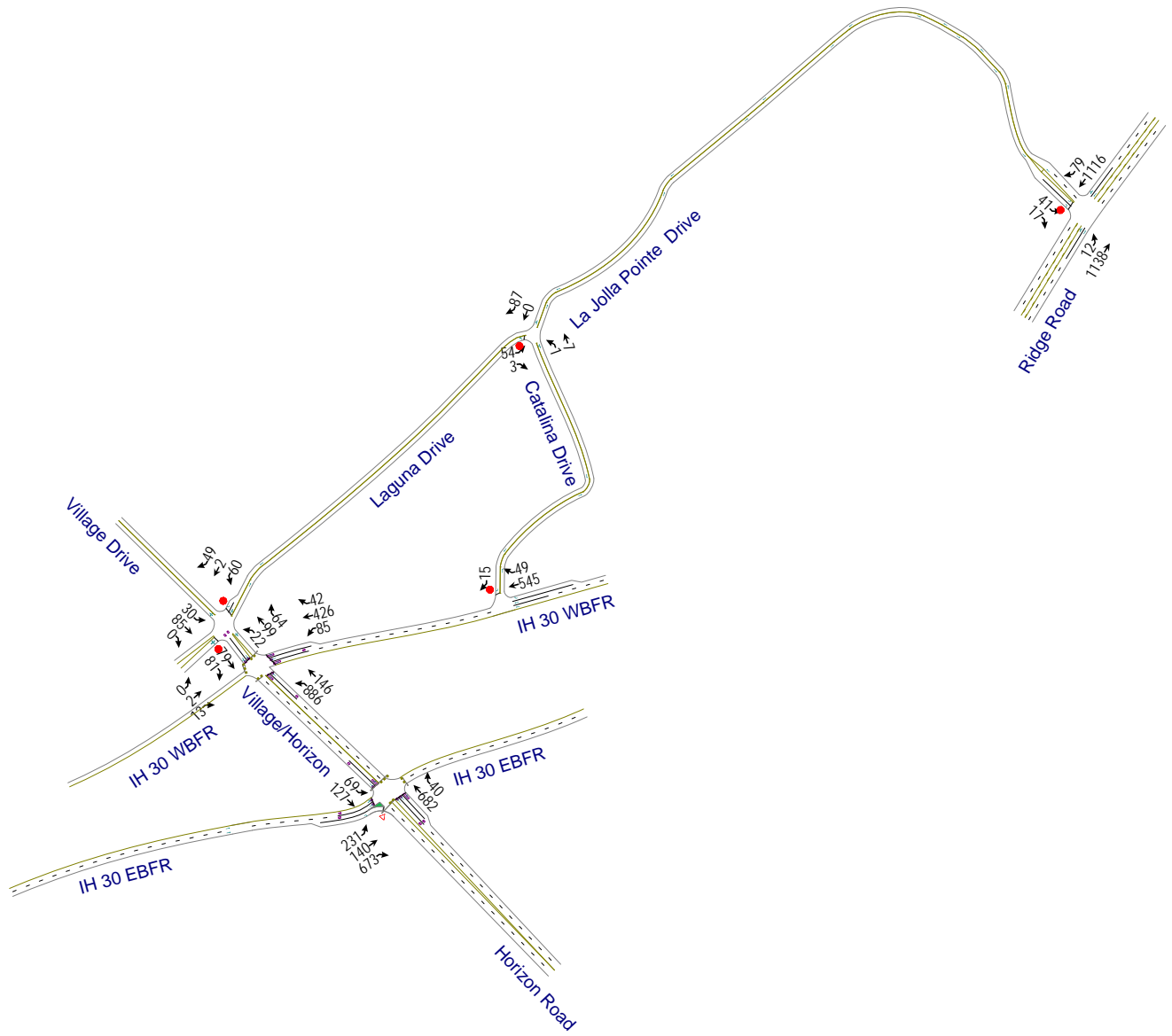


Figure 7

Build-Out Year (2017) Background AM Peak Hour Traffic Volumes

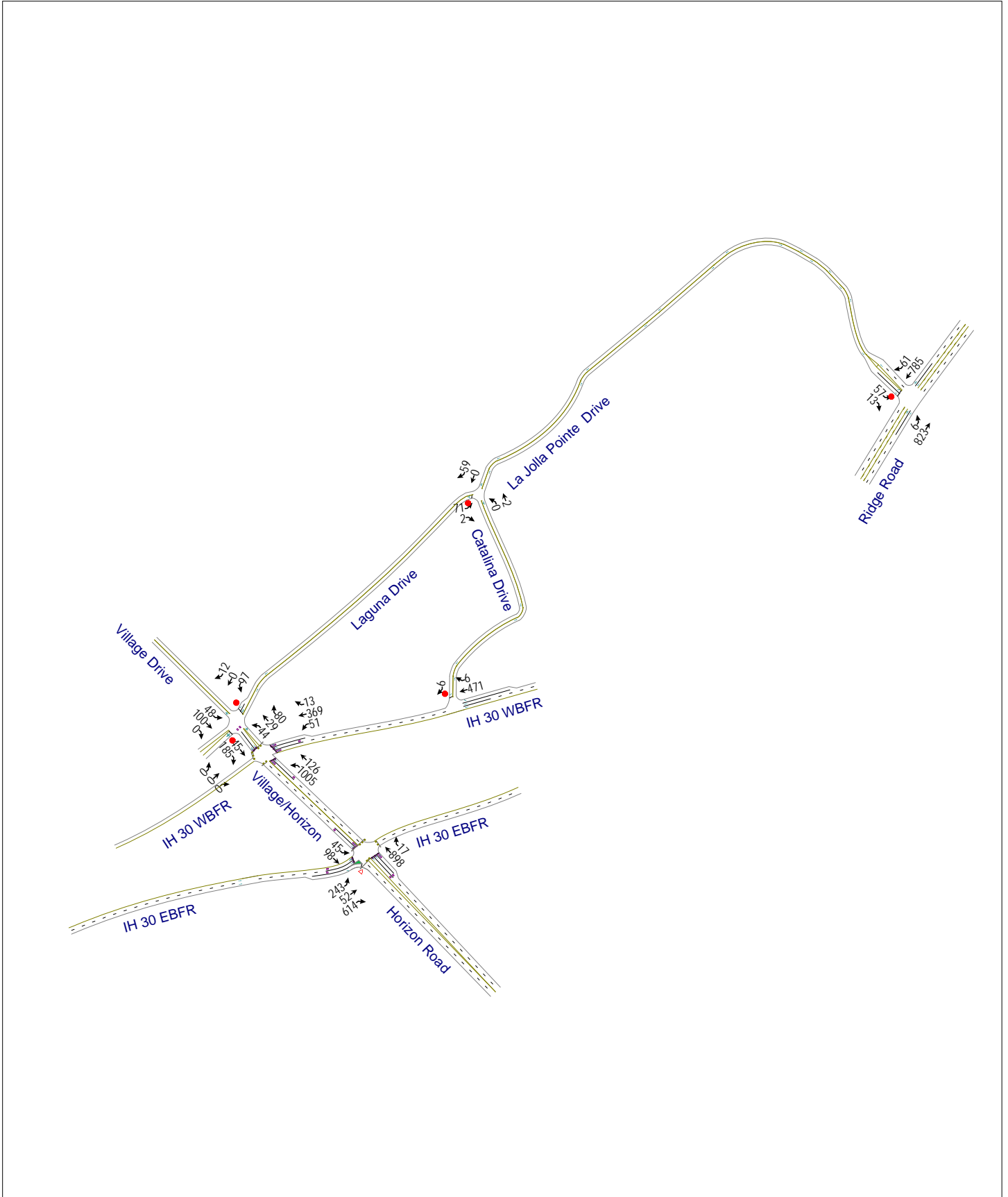


Figure 8

Build-Out Year (2017) Background PM Peak Hour Traffic Volumes

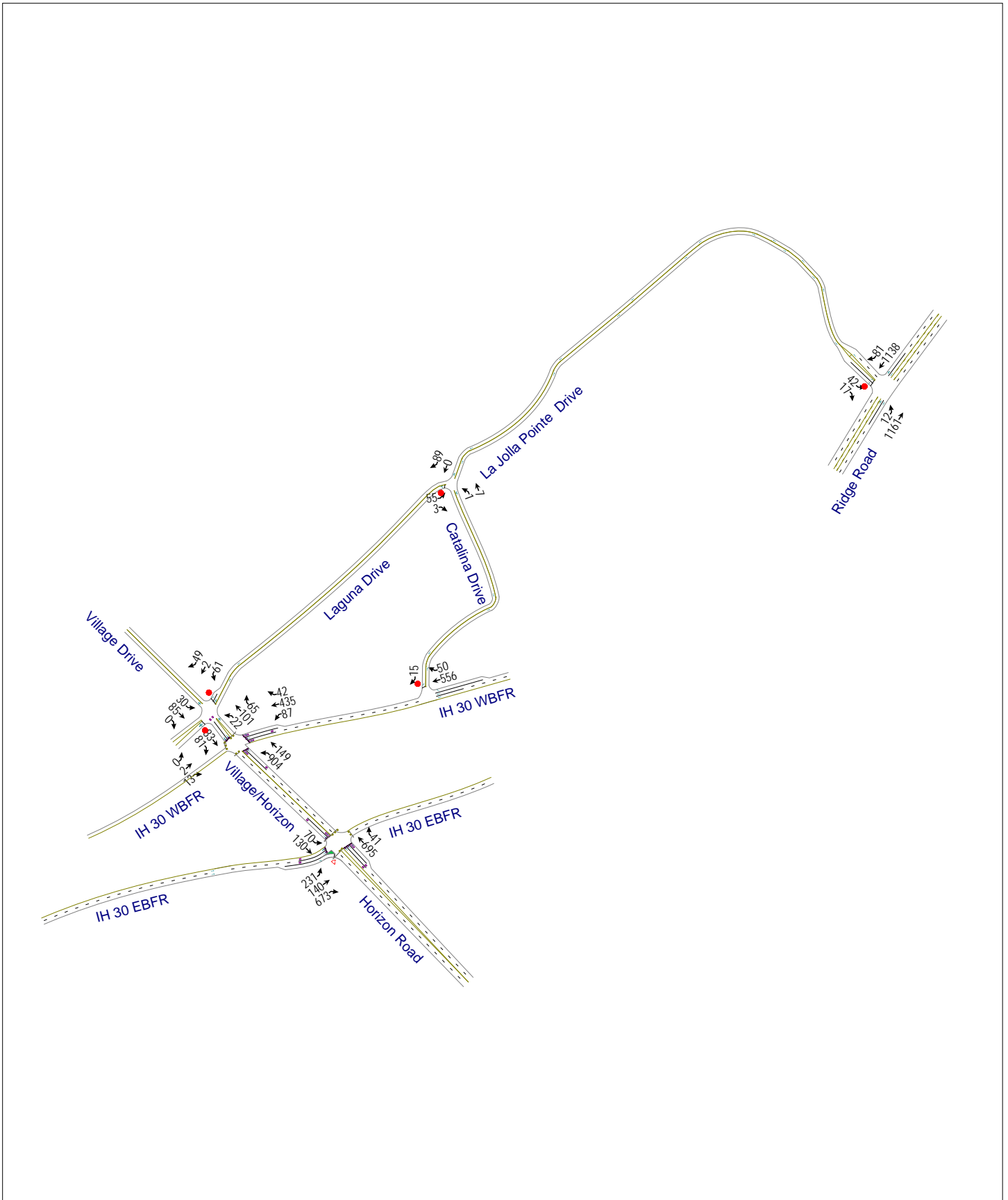


Figure 9

Horizon Year (2022) Background AM Peak Hour Traffic Volumes

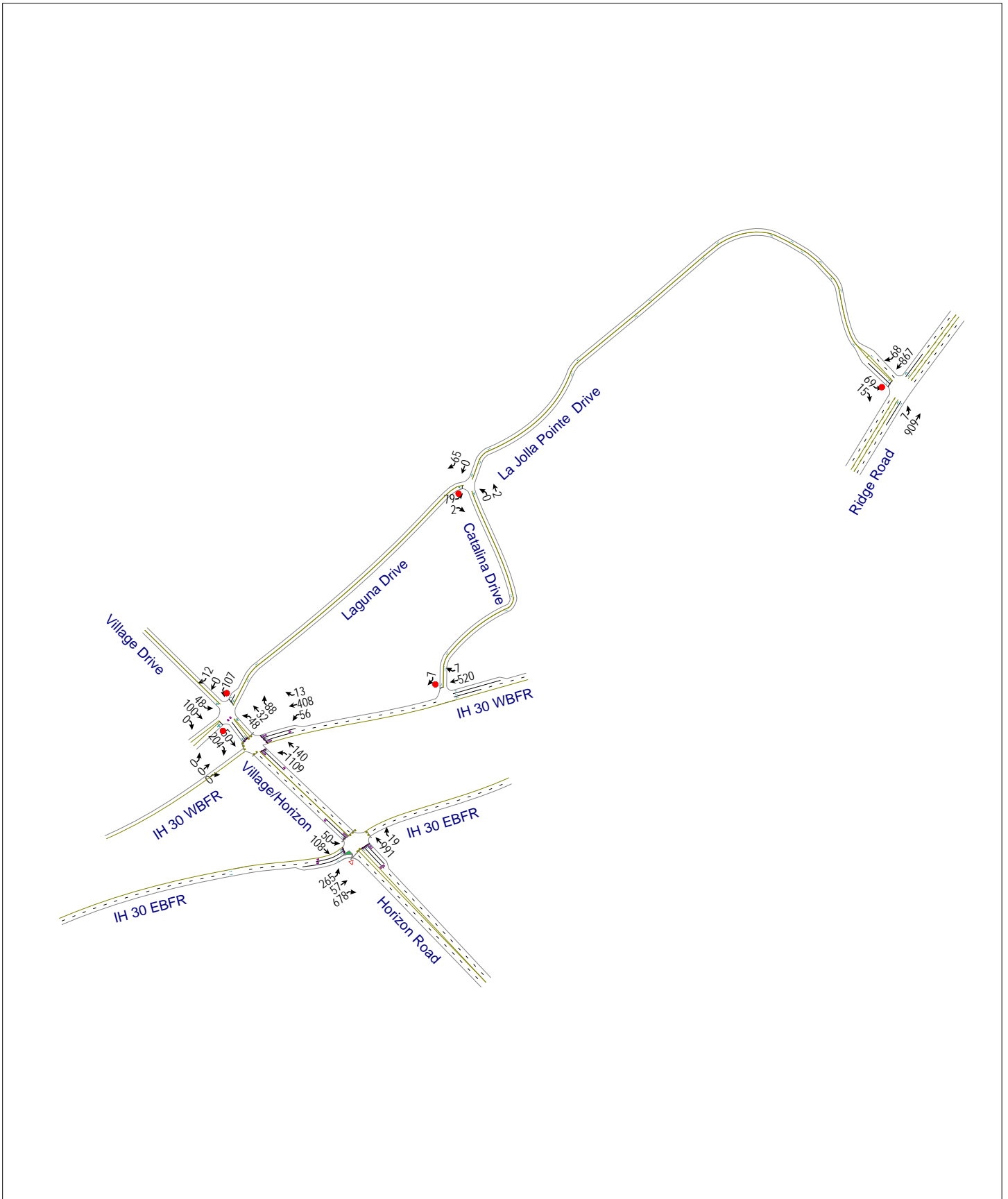
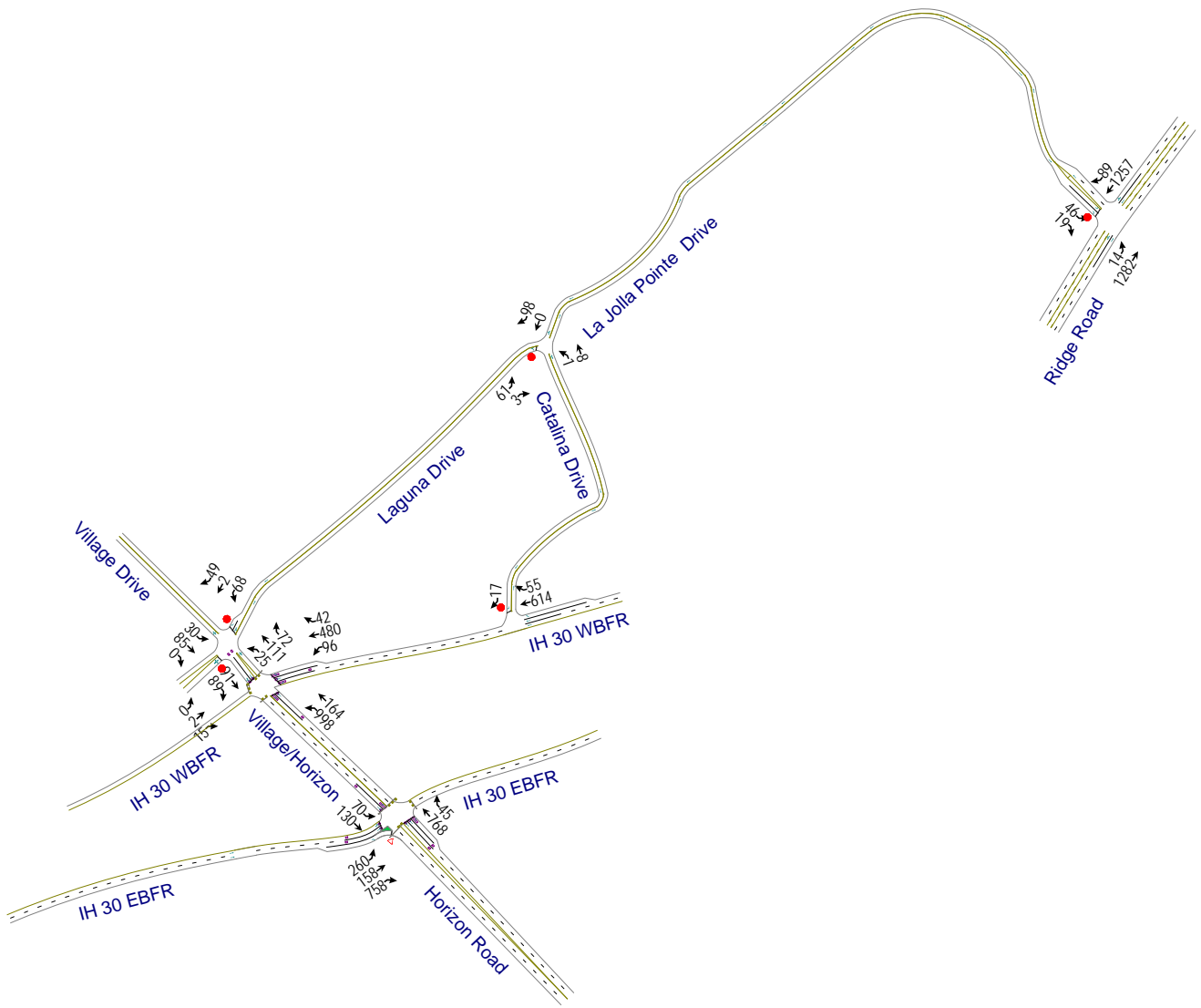


Figure 10

Horizon Year (2022) Background PM Peak Hour Traffic Volumes



TRIP DISTRIBUTION AND ASSIGNMENT

Trip Distribution

The existing traffic volumes and roadways in the area were used to determine the directions from which traffic would approach and depart the proposed multi-family residential facility. The assumed directional distributions for all vehicles are provided in **Figure 11** and **Figure 12**. Figure 11 shows inbound percentages and Figure 12 shows outbound percentages.

Site Traffic Volumes

Traffic volumes expected to be generated by the proposed Davis Apartments were assigned to the area roadways and site access points based on the directional distribution identified in Figures 11 and 12. The estimated site generated traffic volumes for the AM and PM peak hours for all vehicles are shown in **Figure 13** and **Figure 14**.

Total Traffic Conditions

Total (background + site) peak hour traffic volumes at Build-Out Year (2017) were obtained by adding the Build-Out Year (2017) Background traffic volumes (Figure 7 and Figure 8) to the site generated traffic volumes (Figure 13 and Figure 14). **Figure 15** and **Figure 16** show Build-Out Year (2017) Total AM Peak Hour Volume and Build-Out Year (2017) Total PM Peak Hour Volume, respectively.

Similarly, Total peak hour traffic volumes at Horizon Year (2022) were obtained by adding the Horizon Year (2022) Background traffic volumes (Figure 9 and Figure 10) to the site generated traffic volumes (Figure 13 and Figure 14). **Figure 17** and **Figure 18** show Horizon Year (2022) Total AM Peak Hour Volume and Horizon Year (2022) Total PM Peak Hour Volume, respectively.

Figure 11

Assumed Directional Distribution - Inbound Percentages

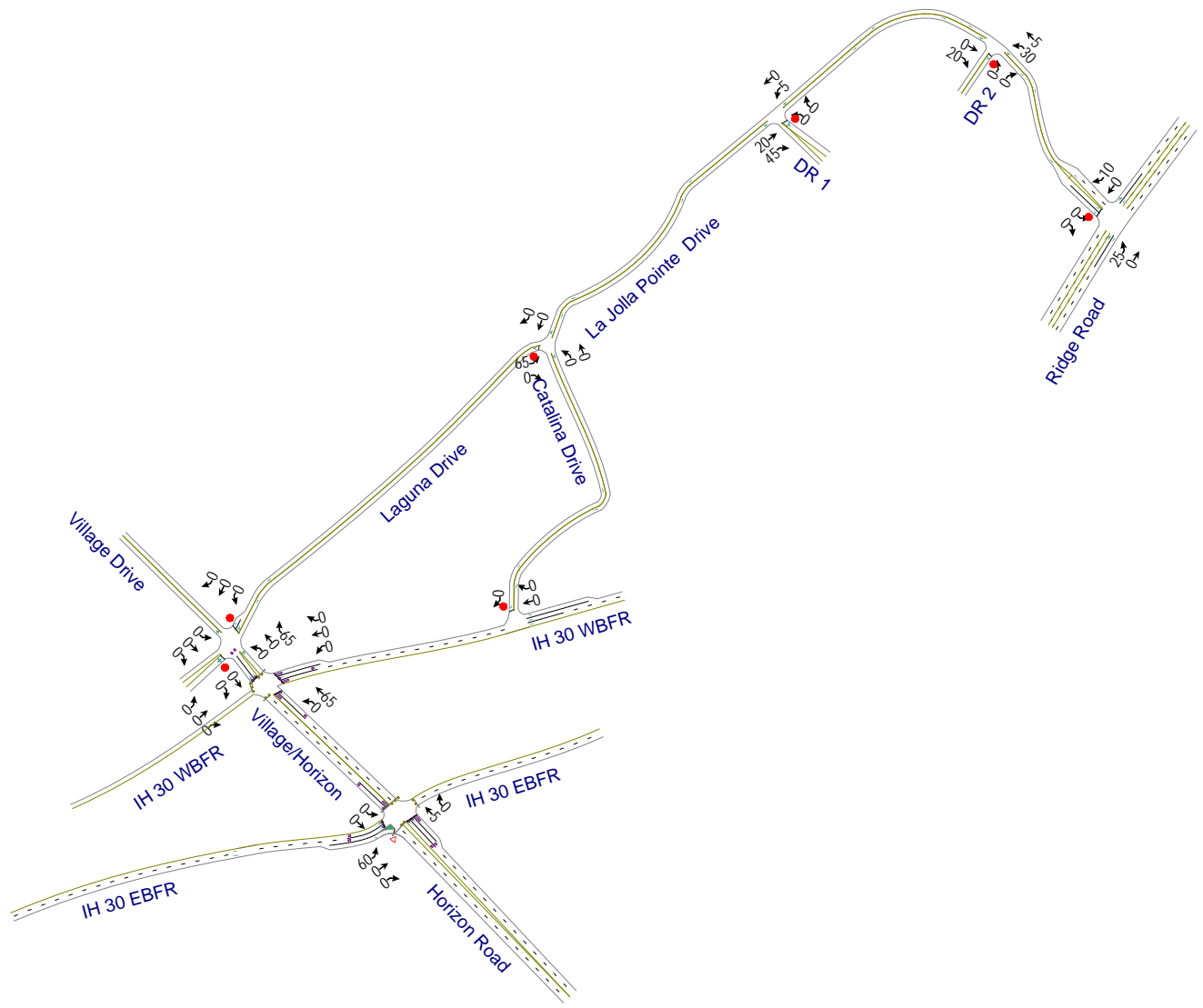


Figure 12

Assumed Directional Distribution - Outbound Percentages

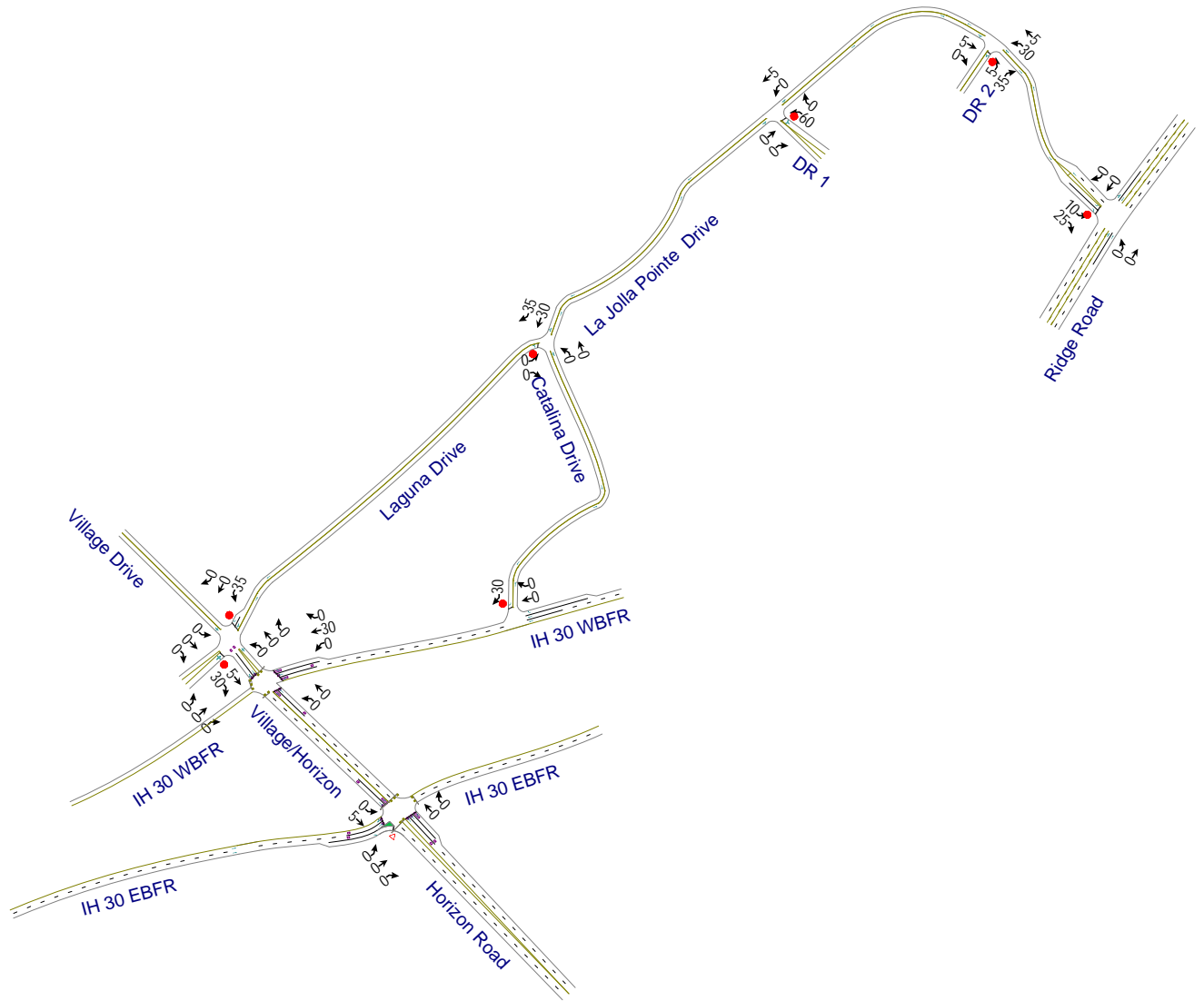


Figure 13

AM Peak hour Site Generated Traffic Volumes

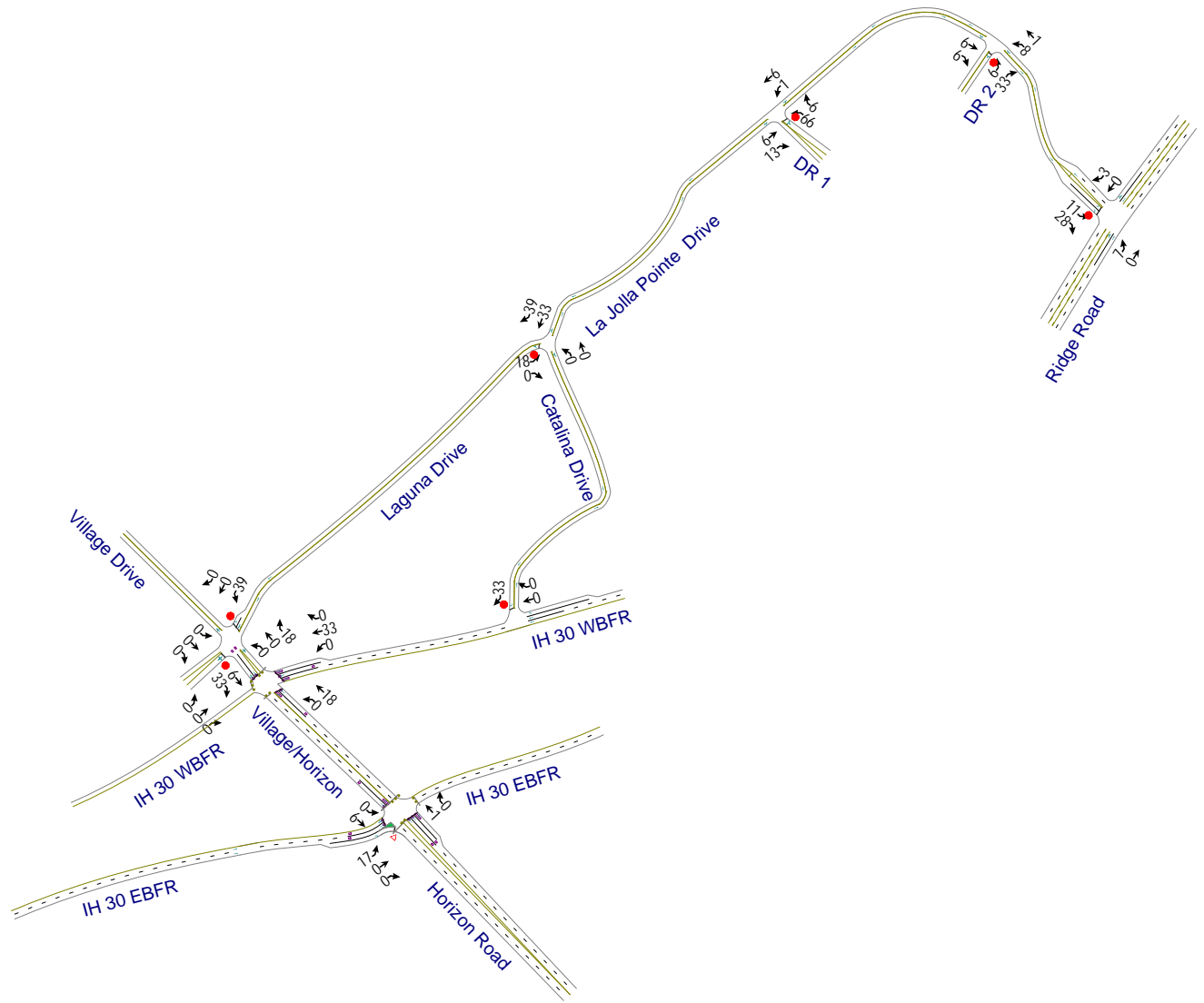


Figure 14

PM Peak hour Site Generated Traffic Volumes

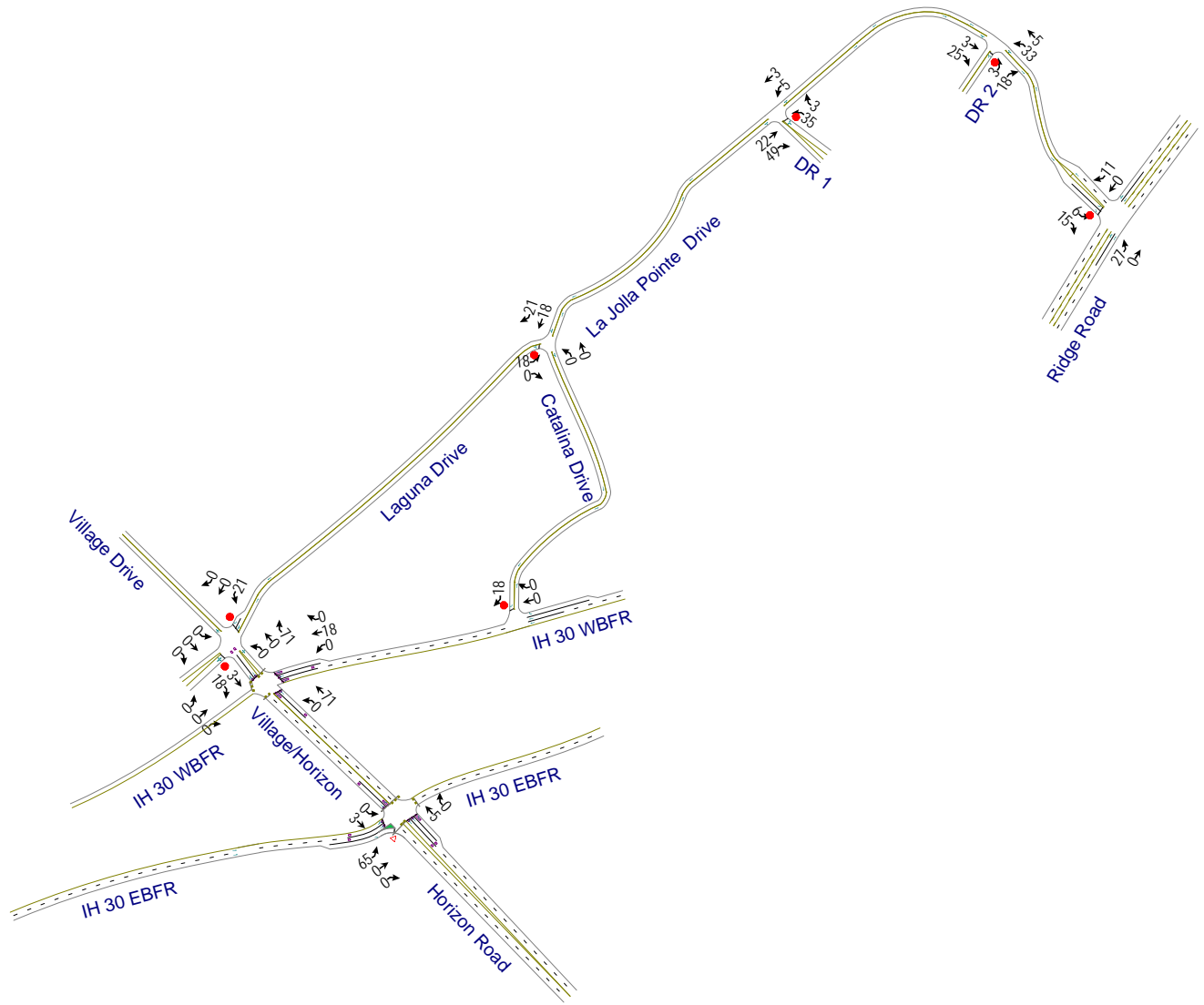


Figure 15

Build-Out Year (2017) Total AM Peak Hour Traffic Volumes

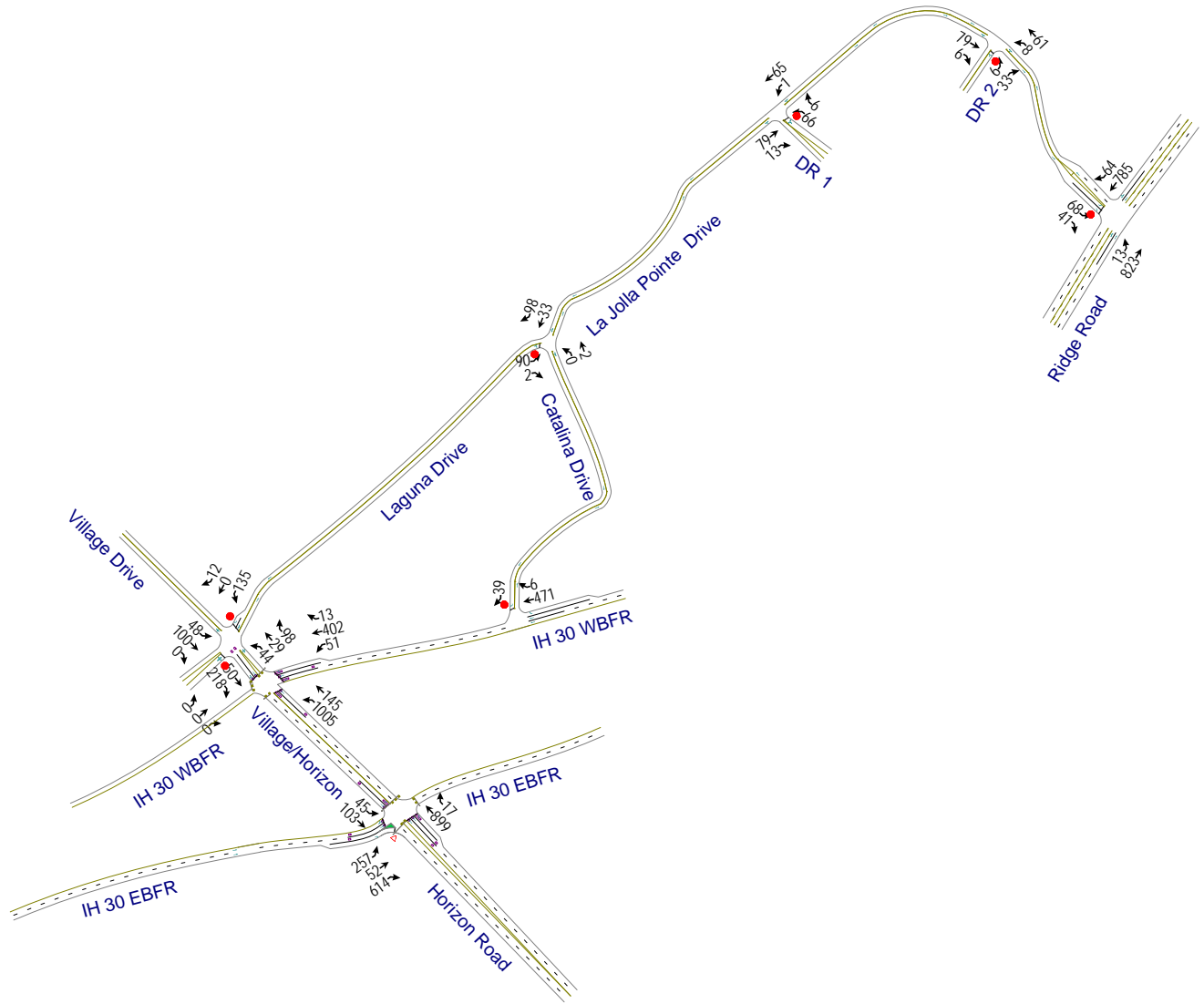


Figure 16

Build-Out Year (2017) Total PM Peak Hour Traffic Volumes

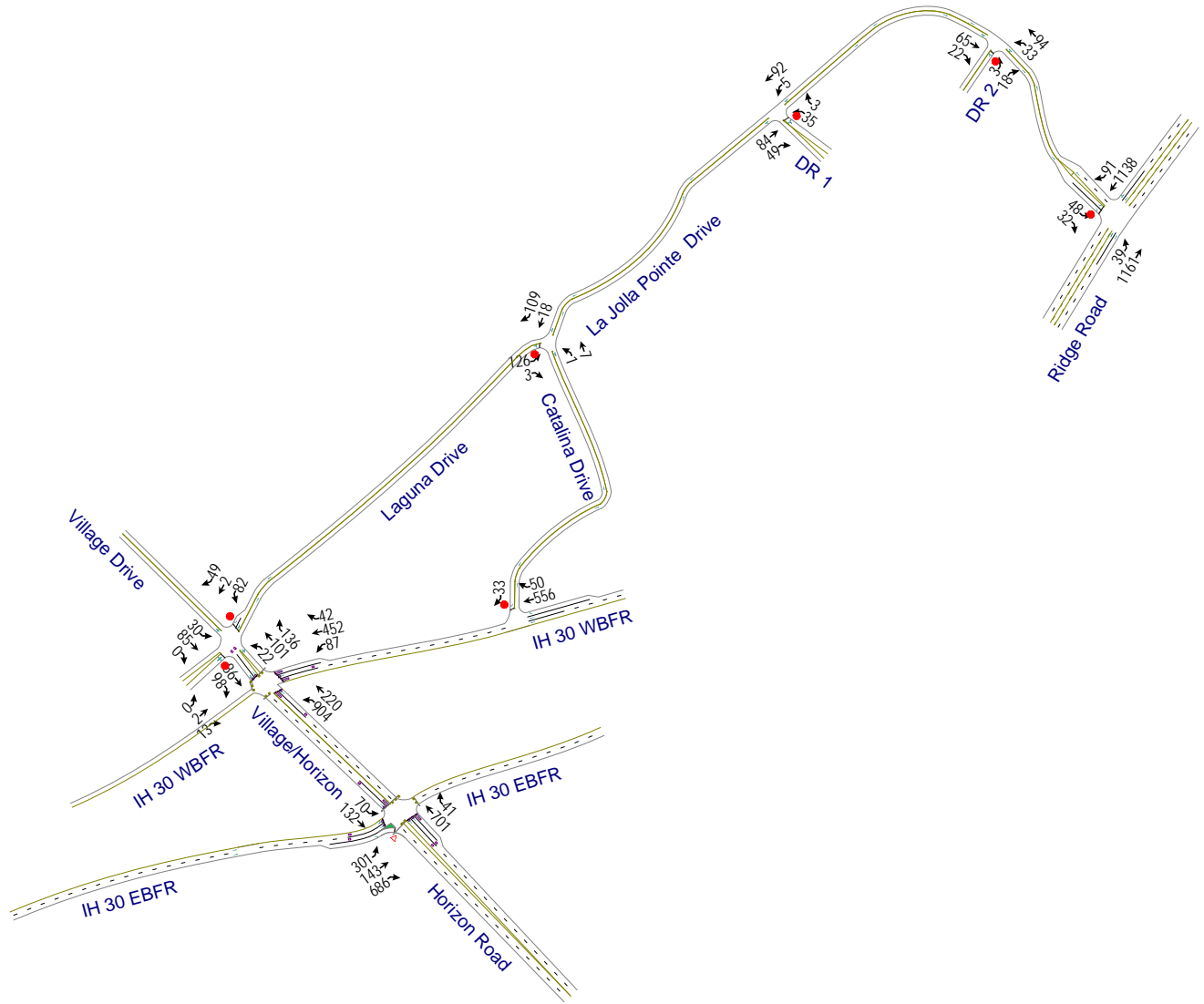


Figure 17

Horizon Year (2022) Total AM Peak Hour Traffic Volumes

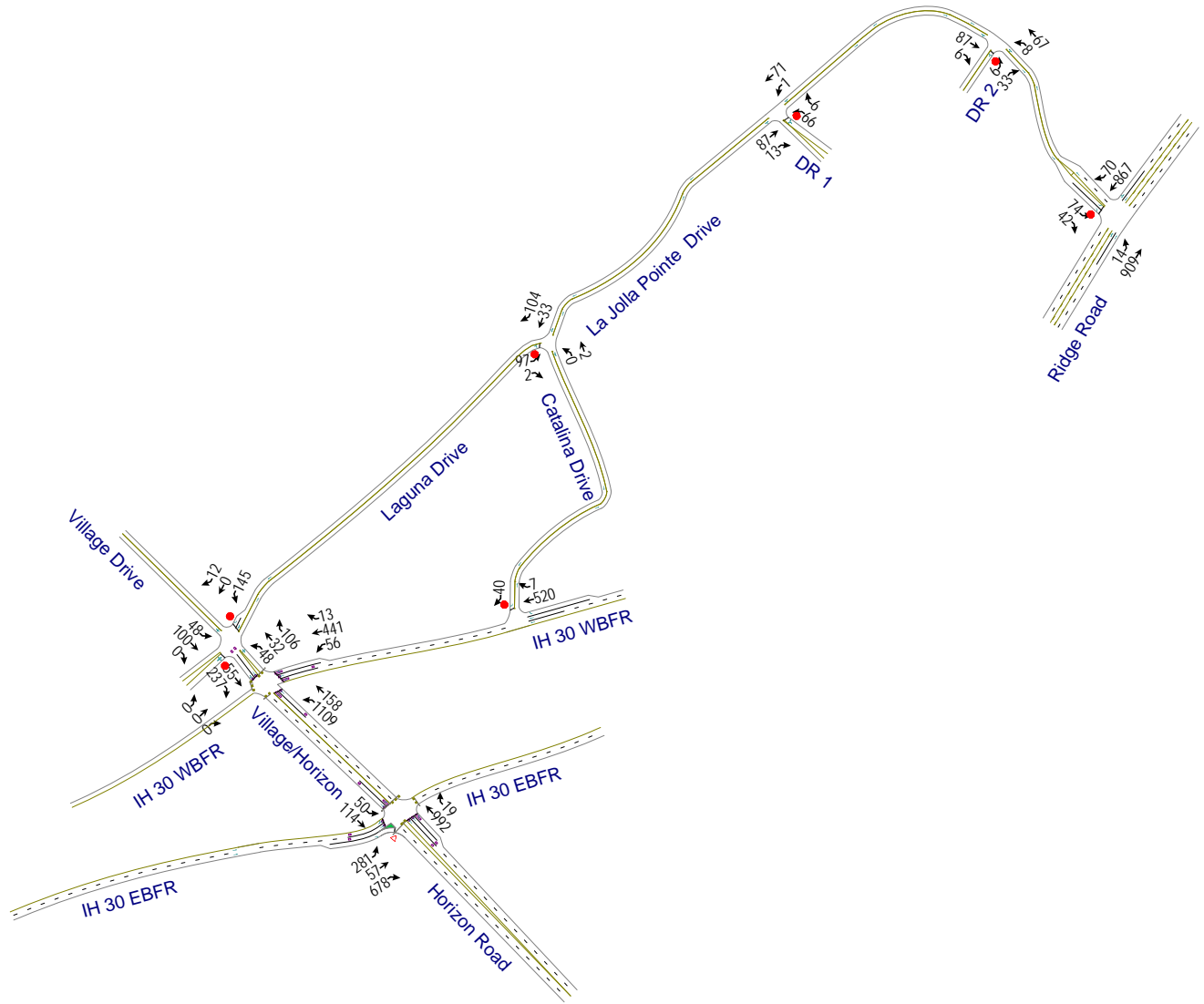
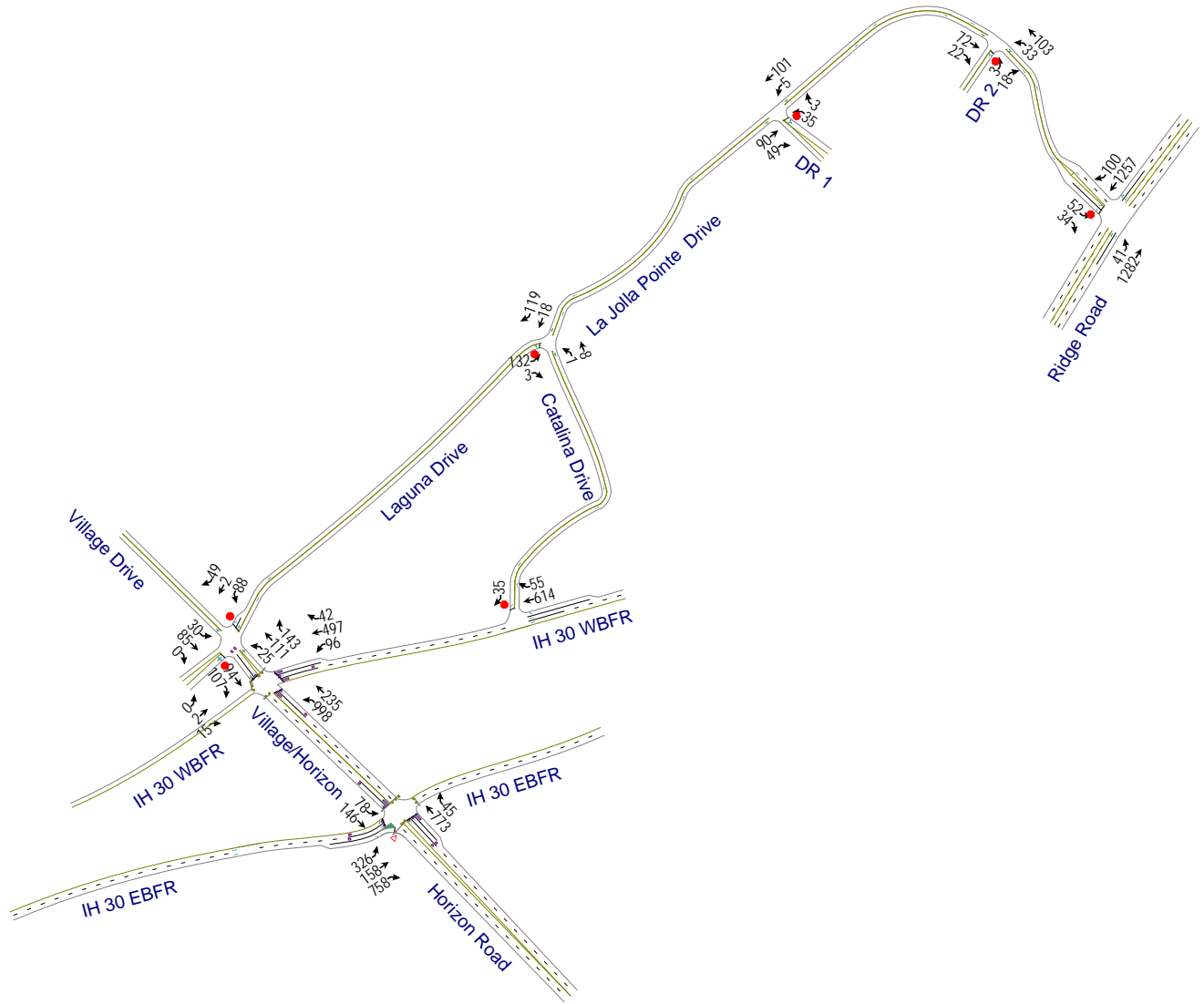


Figure 18

Horizon Year (2022) Total PM Peak Hour Traffic Volumes



INTERSECTION CAPACITY ANALYSES

The Level of Service (LOS) of an intersection is a qualitative measure of capacity and operating conditions and is directly related to vehicle delay. The LOS criteria for a signalized intersection are shown in **Table 5**. LOS is given a letter designation from A to F, with LOS A representing very short delays (less than 10 seconds of average control delay per vehicle) and LOS F representing very long delays (more than 80 seconds of average control delay per vehicle). LOS D, ranging from 35.1 to 55.0 seconds of average control delay per vehicle, is typically considered the minimum acceptable condition.

For unsignalized intersections, the levels of service, as shown in **Table 6**, are defined by average control delay in seconds per vehicle. For unsignalized analyses, LOS D is also typically the minimum acceptable condition.

Capacity analyses were conducted for the study area intersections under the following analysis scenarios:

- Existing (2016) Traffic Conditions
- Build-Out Year (2017) Background Traffic Conditions
- Build-Out Year (2017) Total Traffic Conditions
- Horizon Year (2022) Background Traffic Conditions
- Horizon Year (2022) Total Traffic Conditions

The intersection capacity analyses were conducted using HCM methodologies in the *Synchro 9* traffic analysis software package. For existing and background conditions, the intersection lane configurations provided in Figure 3 were used. For total conditions, the intersection lane configurations provided in Figure 4 were used.

Additional performance measures such as volume to capacity (v/c) ratios and queue lengths also provide an indication of operations. For example, at two-way stop controlled intersections, main street traffic volumes may impose longer average delays for a small number of side-street vehicles, thus creating vehicle delays which correspond to a poor level of service. Motorists and agencies will typically accept longer delays (LOS E to F) if gaps in the traffic stream are anticipated within a reasonable timeframe and the side street traffic volumes do not warrant a traffic signal. As a general guide, gap acceptance thresholds for the longer delay values can be defined when the v/c ratios are under 0.80, which corresponds to 80 percent capacity usage for that movement. Therefore, a traffic movement with a poor level of service and a v/c value below 0.80 could be considered as operating acceptably.

Table 5: Level of Service Criteria for Signalized Intersections

Level-of-Service (LOS)	Average Control Delay (seconds/vehicle)	Description
A	≤ 10.0	Very low vehicle delays, free flow, signal progression extremely favorable, most vehicles arrive during given signal phase.
B	10.1 to 20.0	Good signal progression, more vehicles stop and experience higher delays than for LOS A.
C	20.1 to 35.0	Stable flow, fair signal progression, significant number of vehicles stop at signals.
D	35.1 to 55.0	Congestion noticeable, longer delays and unfavorable signal progression, many vehicles stop at signals.
E	55.1 to 80.0	Limit of acceptable delay, unstable flow, poor signal progression, traffic near roadway capacity, frequent cycle failures.
F	> 80.0	Unacceptable delays, extremely unstable flow and congestion, traffic exceeds roadway capacity, stop-and-go conditions.

SOURCE: *Highway Capacity Manual, HCM 2010*, Transportation Research Board, 2010

Table 6: Level of Service Criteria for Unsignalized Intersections

Level-of-Service (LOS)	Average Control Delay (seconds/vehicle)	Description
A	≤ 10.0	No delays at intersections with continuous flow of traffic. Uncongested operations: high frequency of long gaps available for all left and right turning traffic. No observable queues.
B	10.1 to 15.0	No delays at intersections with continuous flow of traffic. Uncongested operations: high frequency of long gaps available for all left and right turning traffic. No observable queues.
C	15.1 to 25.0	Moderate delays at intersections with satisfactory to good traffic flow. Light congestion; infrequent backups on critical approaches.
D	25.1 to 35.0	Increased probability of delays along every approach. Significant congestion on critical approaches, but intersection functional. No standing long lines formed.
E	35.1 to 50.0	Heavy traffic flow condition. Heavy delays probable. No available gaps for cross-street traffic or main street turning traffic. Limit of stable flow.
F	> 50.0	Unstable traffic flow. Heavy congestion. Traffic moves in forced flow condition. Average delays greater than one minute highly probable. Total breakdown.

SOURCE: *Highway Capacity Manual, HCM 2010*, Transportation Research Board, 2010

Existing and Background Traffic Conditions

The I-30 at Horizon Road/Village Drive interchange is currently over-capacity for the northbound and westbound movements during the AM peak hour. The northbound left turn (NBLT) queue at this intersection extends past the intersection of the I-30 EBFR at Horizon Road during peak hours. During an AM peak hour site visit by Lee Engineering, the queue was observed to extend approximately 2,000 feet back to the intersection of Horizon Road and Ridge Road. No other congestion was observed on the study area roadways.

To model existing conditions as a basis for prediction of future improvements, the lane configurations shown in Figure 3 and the existing and background traffic volumes shown in Figures 5 to 10 were used for these analyses. **Table 7** presents the analysis results for the study area intersections under Existing (2016), Build-Out Year (2017) Background and Horizon Year (2022) Background traffic conditions.

Traffic generated by the proposed the proposed Davis apartment complex (Figures 13 and 14) is not included in any of these analysis results in Table 7. The shaded cells indicate intersections or approaches which are predicted to operate at less than acceptable levels of service (LOS D).

The analysis results in Table 7 indicate significant delay and congestion at the I-30 at Horizon Road/Village Drive interchange that will worsen over time with background development even without the Davis Apartments, but no existing operational problems at other study intersections, consistent with existing conditions field observations.

As indicated earlier, multiple analysis outputs are sometimes required to provide a complete picture of operational performance. As such, Table 7 lists queue lengths that are particularly long and volume/capacity ratios that are close to or greater than 1.0, indicating over-capacity conditions that may or may not be reflected in the accompanying delay estimates. When volume is greater than capacity ($v/c > 1$), the analysis models are known to under-predict delay.

The signalized intersections of the I-30 EBFR at Village Drive/Horizon Road currently operate at level of service (LOS) E during the AM peak hour, below the acceptable LOS D. The northbound approach at this intersection operates at LOS F and E during AM and PM peak hour under existing conditions. The westbound movement at the intersection of Village Drive and I-30 WBFR also operates at LOS F as modeled during the AM peak hour in both existing and future background scenarios, though congestion on this approach was not observed during the AM peak hour site visit.

The analysis predicts the two frontage road intersections will continue to operate unacceptably for future background traffic conditions (without including the proposed Davis Apartment traffic) for build-out year (2017) and horizon year (2022). By 2022, the interchange will run at an overall LOS F during the AM peak hour and LOS E during the PM peak hour.

Table 7: Capacity Analysis Results – Existing and Background Traffic Conditions¹

Village Drive and Laguna Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WB	NBL	SBL
Existing (2016) Conditions	AM	---	0.0 (A)	12.3 (B)	7.5 (A)	7.5 (A)
	PM	---	9.4 (A)	10.7 (B)	7.4 (A)	7.6 (A)
Build-Out Year (2017) Background Conditions	AM	---	0.0 (A)	12.3 (B)	7.5 (A)	7.5 (A)
	PM	---	9.4 (A)	10.7 (B)	7.4 (A)	7.6 (A)
Horizon Year (2022) Background Conditions	AM	---	0.0 (A)	12.7 (B)	7.5 (A)	7.6 (A)
	PM	---	9.4 (A)	11.1 (B)	7.4 (A)	7.7 (A)
Village Drive and I-30 Westbound Frontage Road (Signalized) ³						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Existing (2016) Conditions	AM	51.6 (D)	---	104.4 (F) V/C^5 1.12	32.3 (C) [230] ⁴	42.3 (D)
	PM	33.4 (C)	---	58.8 (E) V/C^5 0.94	19.8 (B) [753] ⁴	29.4 (C)
Build-Out Year (2017) Background Conditions	AM	56.6 (E)	---	110.2 (F) V/C^5 1.14	37.7 (D) [237] ⁴	44.7 (D)
	PM	35.5 (D)	---	58.6 (E) V/C^5 0.95	23.4 (C) [770] ⁴	30.2 (C)
Horizon Year (2022) Background Conditions	AM	93.5 (F)	---	145.8 (F) V/C^5 1.26	80.3 (F) V/C^5 1.17 [278] ⁴	57.9 (E) V/C^5 1.08 dr^6
	PM	57.4 (E)	---	63.1 (E) V/C^5 0.98	57.8 (E) V/C^5 1.09 [840] ⁴	38.6 (D)
Horizon Road and I-30 Eastbound Frontage Road (Signalized) ³						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Existing (2016) Conditions	AM	55.6 (E)	22.2 (C)	---	97.2 (F) V/C^5 1.12 [897] ⁴	19.7 (B)
	PM	36.0 (D)	22.8 (C)	---	61.7 (E) V/C^5 0.96 [684] ⁴	28.5 (C)
Build-Out Year (2017) Background Conditions	AM	59.6 (E)	22.6 (C)	---	105.8 (F) V/C^5 1.14 [924] ⁴	19.7 (B)
	PM	37.9 (D)	23.2 (C)	---	66.4 (E) V/C^5 0.97 [704] ⁴	28.4 (C)
Horizon Year (2022) Background Conditions	AM	81.1 (F)	23.6 (C)	---	152.7 (F) V/C^5 1.26 [1,063] ⁴	19.5 (B)
	PM	54.9 (D)	35.8 (D)	---	96.8 (F) V/C^5 1.08 [818] ⁴	28.3 (C)
Catalina Drive and La Jolla Pointe Drive/Laguna Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WB	NBL	SB
Existing (2016) Conditions	AM	---	9.0 (A)	---	0 (A)	---
	PM	---	9.0 (A)	---	7.4 (A)	---

Build-Out Year (2017) Background Conditions	AM	---	9.0 (A)	---	0 (A)	---
	PM	---	9.0 (A)	---	7.4 (A)	---
Horizon Year (2022) Background Conditions	AM	---	9.0 (A)	---	0 (A)	---
	PM	---	9.1 (A)	---	7.4 (A)	---
I-30 Westbound Frontage Road and Catalina Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WBR	NB	SB
Existing (2016) Conditions	AM	---	---	0 (A)	---	9.9 (A)
	PM	---	---	0 (A)	---	10.4 (B)
Build-Out Year (2017) Background Conditions	AM	---	---	0 (A)	---	10.0 (B)
	PM	---	---	0 (A)	---	10.4 (B)
Horizon Year (2022) Background Conditions	AM	---	---	0 (A)	---	10.2 (B)
	PM	---	---	0 (A)	---	10.7 (B)
Ridge Road and La Jolla Pointe Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EBL	WB	NB	SB
Existing (2016) Conditions	AM	---	9.8 (A)	---	---	20.3 (C)
	PM	---	12.0 (B)	---	---	29.2 (D)
Build-Out Year (2017) Background Conditions	AM	---	9.9 (A)	---	---	20.7 (C)
	PM	---	12.1 (B)	---	---	30.7 (D)
Horizon Year (2022) Background Conditions	AM	---	10.4 (B)	---	---	24.9 (C)
	PM	---	13.1 (B)	---	---	39.2 (E) V/C 0.40

¹ Delay in seconds/vehicle (Level of Service)

² HCM methodology does not provide intersection level of service for two-way stop controlled intersection

³ HCM methodology does not provide level of service for non-standard NEMA phasing. LOS is based on Synchro outputs.

⁴ [##] 95th percentile queue length in feet for NBLT at I-30 WBFR and NBTh at I-30 EBFR

⁵ V/C = Volume/Capacity Ratio

⁶ dr = De facto right turn lane

The southbound left turn (SBLT) at the intersection of La Jolla Pointe Drive and Ridge Road is predicted to operate at LOS E during the PM peak hour under horizon year (2022) background conditions. At this intersection, La Jolla Pointe Drive is a stopped controlled street and Ridge Road has the right-of-way (ROW).

However, the volume/capacity ratio for the horizon year build condition is less than 0.80. As discussed earlier, as a general guide, gap acceptance thresholds for the longer delay values can be defined when the v/c ratios are under 0.80, which corresponds to 80 percent capacity usage for that movement. Therefore, a traffic movement with a poor level of service and a v/c value below 0.80 could be considered as operating acceptably.

All other study are intersections are expected to operate acceptably under existing and build-out conditions.

Mitigations for Existing and Background Traffic Conditions

The intersections of the I-30 frontage roads at Village Drive/Horizon Road are part of a coordinated signal system. Thus, limited signal cycle length optimization was analyzed to determine whether signal timing changes alone could improve LOS. No signal timing improvements could be identified for the future year scenarios that would yield significant operational improvements.

Since the interchange is capacity constrained by the existing lane geometry, additional lanes would be needed to correct the projected deficiencies with or without the Davis Apartments. In particular, a northbound double left turn lane would likely be required. The westbound on-ramp would need to be widened for several hundred feet west of the signal to receive double left turns. Widening of the bridge over IH 30 might also be needed. In either case, analysis of such improvements is outside the scope of this study given the development's small contribution to an already existing traffic problem.

The City of Rockwall also has in preliminary planning a City-funded / TxDOT-construction project that would add a new westbound entrance ramp to I-30 between Ridge Road and Horizon Road. This project may provide additional future relief to the I-30 at Village Drive/Horizon Road interchange. However, since the design phase for the project has not yet begun and the construction schedule is unknown, City staff have requested that no reassignment of traffic be incorporated into this analysis based on the new ramp.

Total Traffic Conditions

To evaluate the Total Traffic Conditions of the study area under Build-Out (2017) and Horizon Year (2022), the study area intersections were analyzed using the proposed lane configurations (Figure 4) and the Total traffic volumes (Figures 15 to 18). **Table 8** presents the capacity analysis results for these conditions.

As shown in Table 8, similar to the exiting and background scenarios, the analysis predicts the two frontage road intersections will continue to operate unacceptably for future total traffic conditions for build-out year (2017) and horizon year (2022). Level of service in 2022 with the Davis Apartments will be no worse than under background conditions, with delays about 10% higher in the AM peak hour and only marginally higher in the PM peak hour.

It should be noted that the proposed site is not predicted to add any traffic to the critical NBLT movement at the I-30 WBFR. During the AM peak period, the site is predicted to add 33 vehicles per hour (vph) to the westbound through movement on the-I 30 WBFR at Village Drive, which is also projected to be over capacity. The proposed site generated traffic is less than 10% of the total existing westbound traffic.

Table 8: Capacity Analysis Results – Total Traffic Conditions¹

Village Drive and Laguna Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WB	NBL	SBL
Build-Out Year (2017) Total Conditions	AM	---	0.0 (A)	13.3 (B)	7.5 (A)	7.6 (A)
	PM	---	9.6 (A)	11.5 (B)	7.4 (A)	7.8 (A)
Horizon Year (2022) Total Conditions	AM	---	0.0 (A)	13.9 (B)	7.5 (A)	7.6 (A)
	PM	---	9.6 (A)	11.9 (B)	7.4 (A)	7.9 (A)
Village Drive and I-30 Westbound Frontage Road (Signalized) ³						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Build-Out Year (2017) Total Conditions	AM	67.6 ³ (E)	---	141.3 (F) V/C ⁵ 1.24	39.1 (D) [248] ⁴	56.6 (E) V/C ⁵ 1.08 d ⁶
	PM	37.5 (D)	---	60.4 (E) V/C ⁵ 0.96	25.7 (C) [791] ⁴	34.4 (C)
Horizon Year (2022) Total Conditions	AM	104.3 (F)	---	180.2 (F) V/C ⁵ 1.36	78.6 (E) V/C ⁵ 1.17 [259] ⁴	79.1 (E) V/C ⁵ 1.27 dr
	PM	61.8 (E)	---	65.1 (E) V/C ⁵ 0.99	63.7 (E) V/C ⁵ 1.12 [858] ⁴	44.1 (D)
Horizon Road and I-30 Eastbound Frontage Road (Signalized) ³						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Build-Out Year (2017) Total Conditions	AM	59.6 (E)	23.1 (C)	---	106.3 (F) V/C ⁵ 1.14 [9254] ⁴	18.6 (B)
	PM	41.2 (D)	26.2 (C)	---	73.7 (E) V/C ⁵ 0.98 [713] ⁴	27.5 (C)
Horizon Year (2022) Total Conditions	AM	81.0 (F)	24.2 (C)	---	153.2 (F) V/C ⁵ 1.26 [1,066] ⁴	18.6 (B)
	PM	56.9 (E)	41.1 (D)	---	96.6 (F) V/C ⁵ 1.08 [824] ⁴	26.8 (C)
Catalina Drive and La Jolla Pointe Drive/Laguna Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WB	NBL	SB
Build-Out Year (2017) Total Conditions	AM	---	9.3 (A)	---	0 (A)	---
	PM	---	9.6 (A)	---	7.5 (A)	---
Horizon Year (2022) Total Conditions	AM	---	9.4 (A)	---	0 (A)	---
	PM	---	9.6 (A)	---	7.5 (A)	---
I-30 Westbound Frontage Road and Catalina Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WBR	NB	SB
Build-Out Year	AM	---	---	0 (A)	---	10.2 (B)

(2017) Total Conditions	PM	---	---	0 (A)	---	10.6 (B)
Horizon Year (2022) Total Conditions	AM	---	---	0 (A)	---	10.5 (B)
	PM	---	---	0 (A)	---	10.9 (B)
Driveway 1 and La Jolla Pointe Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WB	NBR	SBL
Build-Out Year (2017) Total Conditions	AM	---	---	9.8 (A)	0 (A)	7.4 (A)
	PM	---	---	10.0 (B)	0 (A)	7.5 (A)
Horizon Year (2022) Total Conditions	AM	---	---	9.9 (A)	0 (A)	7.4 (A)
	PM	---	---	10.1 (B)	0 (A)	7.5 (A)
Driveway 2 and La Jolla Pointe Drive/Laguna Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EB	WB	NBL	SBR
Build-Out Year (2017) Total Conditions	AM	---	9.0 (A)	---	7.4 (A)	0 (A)
	PM	---	9.0 (A)	---	7.5 (A)	0 (A)
Horizon Year (2022) Total Conditions	AM	---	9.1 (A)	---	7.4 (A)	0 (A)
	PM	---	9.0 (A)	---	7.5 (A)	0 (A)
Ridge Road and La Jolla Pointe Drive (TWSC) ²						
Scenario	Peak Hour	Intersection	EBL	WB	NB	SB
Build-Out Year (2017) Total Conditions	AM	---	10.0 (A)	---	---	19.8 (C)
	PM	---	12.7 (B)	---	---	33.9 (D)
Horizon Year (2022) Total Conditions	AM	---	10.4 (B)	---	---	23.1 (C)
	PM	---	13.8 (B)	---	---	51.6 (F) V/C ⁵ 0.54

¹ Delay in seconds/vehicle (Level of Service)

² HCM methodology does not provide intersection level of service for two-way stop controlled intersection

³ HCM methodology does not provide level of service for non-standard NEMA phasing. LOS is based on Synchro outputs.

⁴ [##] 95th percentile queue length in feet for NBLT at I-30 WBFR and NBTh at I-30 EBFR

⁵ V/C = Volume/Capacity Ratio

⁶ dr = De facto right turn lane

Similar to the Horizon Year Background conditions, the southbound left turn (SBLT) at the intersection of La Jolla Pointe Drive and Ridge Road is predicted to operate at LOS F during the PM peak hour under horizon year (2022) total conditions. At this intersection, La Jolla Pointe Drive is a stopped controlled street and Ridge Road has the right-of-way. However, the volume/capacity ratio for the horizon year build condition is projected to be less than 0.80, so the operation of the intersection is expected to be satisfactory, with relatively low turning volumes that would not warrant a traffic signal.

All other study are intersections are expected to operate acceptably under total conditions.

ACCESS MANAGEMENT ANALYSES

As part of this study, access management analyses were performed to consider the need for deceleration lanes and to determine if adequate driveway spacing and intersection sight distance is provided for the site driveways.

Right Turn Deceleration Lane Analysis

The site access driveways were analyzed to determine if right turn deceleration lanes would be required. Based on guidelines presented in TxDOT’s Access Management Manual and used by several cities in the Dallas-Fort Worth area, right turn deceleration lanes are typically considered under the following conditions:

- Right turn volumes greater than 50 vph (if posted speed limit greater than 45 mph)
- Right turn volumes greater than 60 vph (if posted speed limit less than/equal to 45 mph)

Table 9 summarizes the projected right turn volumes under Build-Out Year (2017) Total traffic conditions.

Table 9: Right Turn Deceleration Lane Analysis Results

Intersection	Scenario	Approach	Speed Limit (mph)	Volume (vph) AM (PM)	Threshold (vph)	Exceeds Threshold? AM (PM)
Driveway 1 at La Jolla Pointe Drive	Build-Out Year (2017) Total	NB	30	2 (49)	60	No (No)
Driveway 2 at La Jolla Pointe Drive	Build-Out Year (2017) Total	SB	30	6 (22)	60	No (No)

As shown in Table 9, the site driveways do not exceed the threshold for consideration of a right turn deceleration lane during both the AM and PM peak hours.

Intersection Sight Distance

As part of this traffic analysis, the available and required intersection sight distances for motorists accessing the adjacent roadways from the proposed site driveways were analyzed. The sight distances required at the proposed site driveways were estimated using the procedures developed by the American Association of State Highway and Transportation Officials (AASHTO) and published in the 2011 edition of *A Policy on Geometric Design of Highways and Streets*. At these locations, the motorist should be able to see if and when adequate gaps exist to perform their desired maneuver. **Table 10** presents the required and available sight distance for vehicles exiting

at the proposed Davis Apartments site driveways.

Table 10: Sight Distance Evaluation

Major Roadway	La Jolla Pointe Drive	La Jolla Pointe Drive
Posted Speed Limit	30 mph	30 mph
Minor Roadway	DWY 1	DWY 2
Design Vehicle	Passenger Car	Passenger Car
Required Intersection Sight Distance	335'	300' ¹ to left, 335' to right
Available Sight Distance to the Left	~375'	~300'
Available Sight Distance to the Right	~390'	~350'
Sight Distance Adequate?	To the Left?	Yes
	To the Right?	Yes
		N/A

¹ Grade Correction for +5% grade

The required sight distance for 30 mph speed is 335 feet per AASHTO guidelines. Five percent positive grade was observed on the southbound approach on La Jolla Pointe Drive near site Driveway 2. The calculated adjustment to the required sight distance given the increased ability to stop on a 5% upgrade is about 10% less sight distance required. Thus, the required site distance for the site Driveway 2 has been reduced to 300 feet.

The field investigation indicated that the available sight distance at the proposed driveway locations meet the required sight distances at the time of the field visit, when vegetation was not yet in full foliage.

Vegetation along the west side of La Jolla Pointe Drive north of Ridge Road (north of the eastern site driveway) should be removed/relocated to obtain clear sight distance. Smaller trees near the roadway edge may need to be removed, and the larger trees with low canopies set farther back from the road's edge may need to be removed or replaced with trees having higher canopies for clear line of sight. Future on-street parking should also be restricted in this area north of the eastern driveway so it does not interfere with line of sight for drivers looking left.

CONCLUSIONS

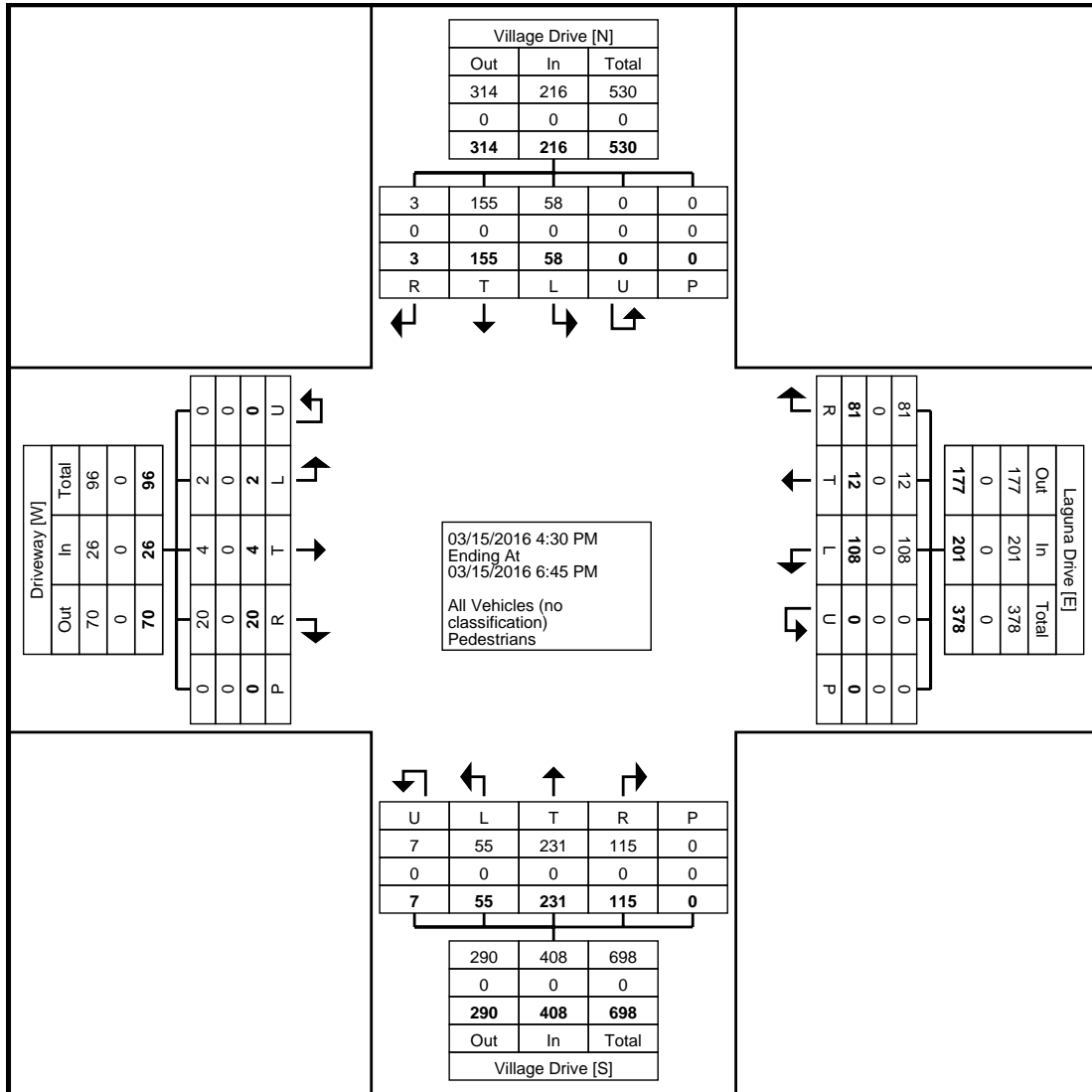
Based on the analysis of the proposed site plan and characteristics of the Davis Apartments multifamily residential facility, the following conclusions can be made:

- The proposed multifamily apartments are expected to generate 1,772 trips on a daily basis with 138 trips during the AM peak hour and 168 trips during the PM peak hour.
- The signalized intersections of the I-30 frontage roads at Village Drive/Horizon Road currently operate at less than acceptable LOS under existing (2016) conditions. The addition of site traffic will not significantly deteriorate the LOS at this intersection for build-out (2017) and horizon year (2022) conditions.
- Under horizon year (2022) background and total conditions, the southbound approach at the intersection of Ridge Road and La Jolla Pointe Drive is predicted to operate at poor levels of service (LOS E) during the PM peak hour. However, the volume/capacity ratio is projected to be significantly below 0.80, which indicates acceptable operations despite higher delay for low-volume movements.
- Right turn deceleration lanes at the project driveways are not warranted.
- Adequate sight distance is predicted to be provided for passenger cars exiting the site driveways if vegetation along the west side of La Jolla Pointe Drive north of Ridge Road will be removed/relocated to obtain clear sight distance and on-street parking is not allowed within the appropriate intersection sight triangles.

APPENDIX

Turning Movement Data

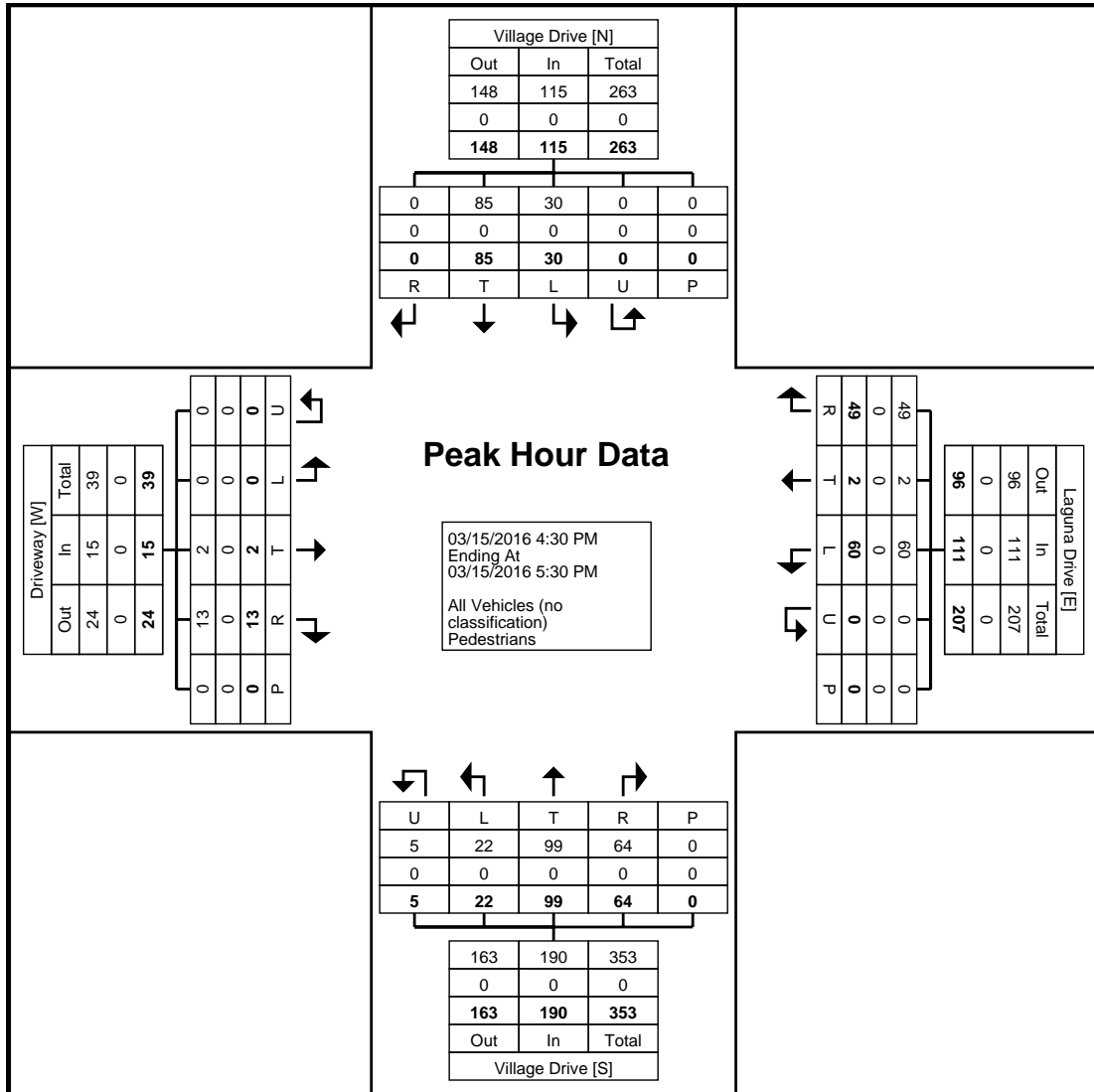
Start Time	Village Drive Southbound						Laguna Drive Westbound						Village Drive Northbound						Driveway Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	6	29	0	0	0	35	17	0	13	0	0	30	1	33	21	0	0	55	0	0	4	0	0	4	124
4:45 PM	6	21	0	0	0	27	16	1	8	0	0	25	7	26	16	3	0	52	0	1	3	0	0	4	108
Hourly Total	12	50	0	0	0	62	33	1	21	0	0	55	8	59	37	3	0	107	0	1	7	0	0	8	232
5:00 PM	11	9	0	0	0	20	13	0	11	0	0	24	8	17	12	1	0	38	0	1	0	0	0	1	83
5:15 PM	7	26	0	0	0	33	14	1	17	0	0	32	6	23	15	1	0	45	0	0	6	0	0	6	116
5:30 PM	6	25	1	0	0	32	17	3	10	0	0	30	8	32	12	2	0	54	1	1	3	0	0	5	121
5:45 PM	11	20	2	0	0	33	11	3	6	0	0	20	6	25	8	0	0	39	0	0	2	0	0	2	94
Hourly Total	35	80	3	0	0	118	55	7	44	0	0	106	28	97	47	4	0	176	1	2	11	0	0	14	414
6:00 PM	5	10	0	0	0	15	9	1	8	0	0	18	7	39	17	0	0	63	0	0	2	0	0	2	98
6:15 PM	6	15	0	0	0	21	11	3	8	0	0	22	12	36	14	0	0	62	1	1	0	0	0	2	107
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	58	155	3	0	0	216	108	12	81	0	0	201	55	231	115	7	0	408	2	4	20	0	0	26	851
Approach %	26.9	71.8	1.4	0.0	-	-	53.7	6.0	40.3	0.0	-	-	13.5	56.6	28.2	1.7	-	-	7.7	15.4	76.9	0.0	-	-	-
Total %	6.8	18.2	0.4	0.0	-	25.4	12.7	1.4	9.5	0.0	-	23.6	6.5	27.1	13.5	0.8	-	47.9	0.2	0.5	2.4	0.0	-	3.1	-
All Vehicles (no classification)	58	155	3	0	-	216	108	12	81	0	-	201	55	231	115	7	-	408	2	4	20	0	-	26	851
% All Vehicles (no classification)	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Data Plot

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Village Drive Southbound						Laguna Drive Westbound						Village Drive Northbound						Driveway Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	6	29	0	0	0	35	17	0	13	0	0	30	1	33	21	0	0	55	0	0	4	0	0	4	124
4:45 PM	6	21	0	0	0	27	16	1	8	0	0	25	7	26	16	3	0	52	0	1	3	0	0	4	108
5:00 PM	11	9	0	0	0	20	13	0	11	0	0	24	8	17	12	1	0	38	0	1	0	0	0	1	83
5:15 PM	7	26	0	0	0	33	14	1	17	0	0	32	6	23	15	1	0	45	0	0	6	0	0	6	116
Total	30	85	0	0	0	115	60	2	49	0	0	111	22	99	64	5	0	190	0	2	13	0	0	15	431
Approach %	26.1	73.9	0.0	0.0	-	-	54.1	1.8	44.1	0.0	-	-	11.6	52.1	33.7	2.6	-	-	0.0	13.3	86.7	0.0	-	-	-
Total %	7.0	19.7	0.0	0.0	-	26.7	13.9	0.5	11.4	0.0	-	25.8	5.1	23.0	14.8	1.2	-	44.1	0.0	0.5	3.0	0.0	-	3.5	-
PHF	0.682	0.733	0.000	0.000	-	0.821	0.882	0.500	0.721	0.000	-	0.867	0.688	0.750	0.762	0.417	-	0.864	0.000	0.500	0.542	0.000	-	0.625	0.869
All Vehicles (no classification)	30	85	0	0	-	115	60	2	49	0	-	111	22	99	64	5	-	190	0	2	13	0	-	15	431
% All Vehicles (no classification)	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	100.0	-	100.0	-	100.0	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



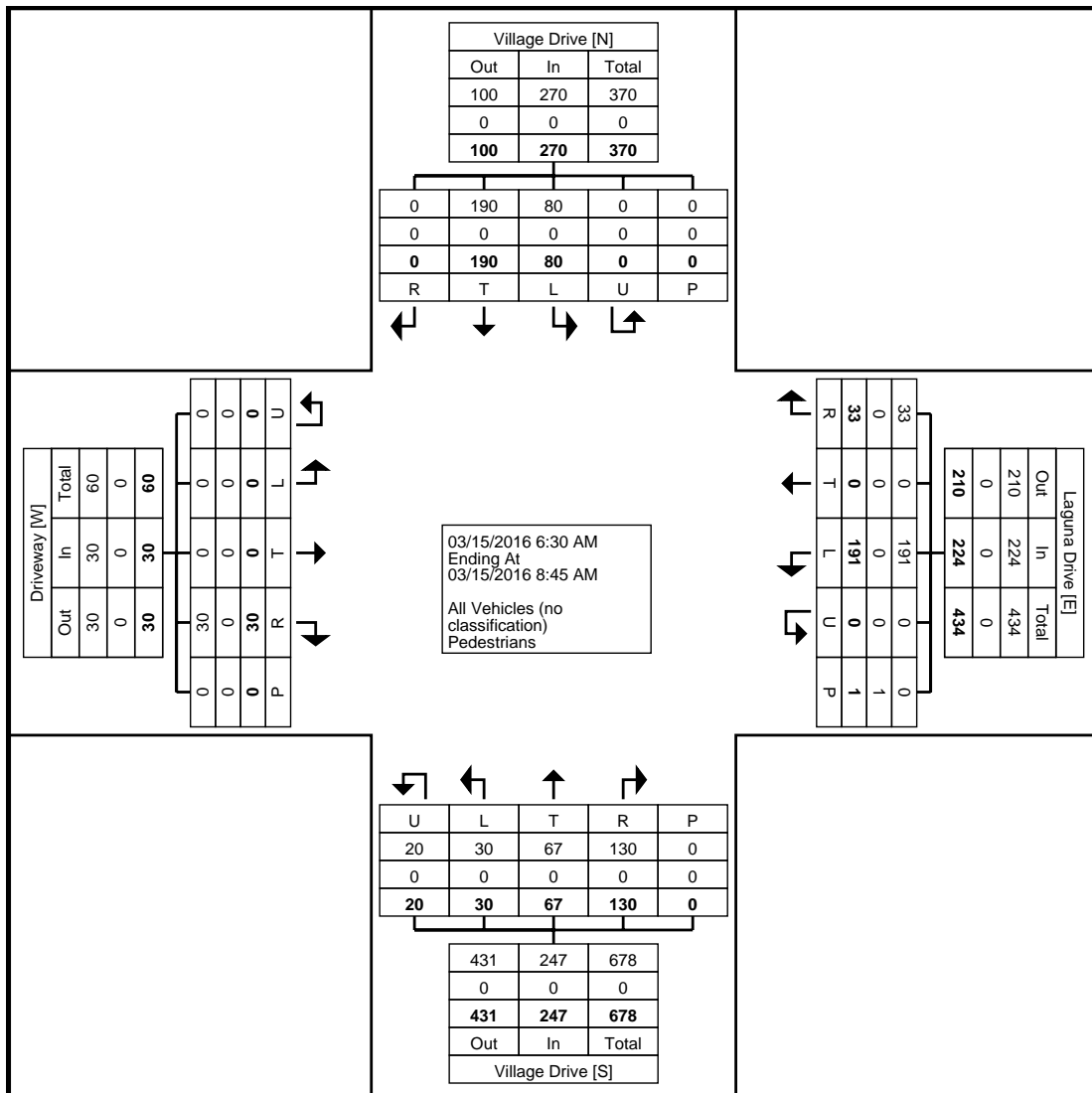
Turning Movement Peak Hour Data Plot (4:30 PM)

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

Count Name: Village Drive
(Horizon) at Laguna Drive (PM)
Site Code: 4
Start Date: 03/15/2016
Page No: 5

Turning Movement Data

Start Time	Village Drive Southbound						Laguna Drive Westbound						Village Drive Northbound						Driveway Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:30 AM	2	23	0	0	0	25	16	0	1	0	0	17	4	9	9	3	0	25	0	0	4	0	0	4	71
6:45 AM	9	26	0	0	0	35	23	0	0	0	0	23	6	5	22	3	0	36	0	0	6	0	0	6	100
Hourly Total	11	49	0	0	0	60	39	0	1	0	0	40	10	14	31	6	0	61	0	0	10	0	0	10	171
7:00 AM	8	24	0	0	0	32	20	0	2	0	1	22	3	5	18	7	0	33	0	0	3	0	0	3	90
7:15 AM	11	29	0	0	0	40	27	0	6	0	0	33	4	5	16	6	0	31	0	0	4	0	0	4	108
7:30 AM	18	21	0	0	0	39	25	0	4	0	0	29	13	13	22	1	0	49	0	0	13	0	0	13	130
7:45 AM	17	21	0	0	0	38	26	0	6	0	0	32	0	9	15	0	0	24	0	0	0	0	0	0	94
Hourly Total	54	95	0	0	0	149	98	0	18	0	1	116	20	32	71	14	0	137	0	0	20	0	0	20	422
8:00 AM	1	24	0	0	0	25	27	0	13	0	0	40	0	4	16	0	0	20	0	0	0	0	0	0	85
8:15 AM	13	22	0	0	0	35	27	0	1	0	0	28	0	17	12	0	0	29	0	0	0	0	0	0	92
8:30 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	80	190	0	0	0	270	191	0	33	0	1	224	30	67	130	20	0	247	0	0	30	0	0	30	771
Approach %	29.6	70.4	0.0	0.0	-	-	85.3	0.0	14.7	0.0	-	-	12.1	27.1	52.6	8.1	-	-	0.0	0.0	100.0	0.0	-	-	-
Total %	10.4	24.6	0.0	0.0	-	35.0	24.8	0.0	4.3	0.0	-	29.1	3.9	8.7	16.9	2.6	-	32.0	0.0	0.0	3.9	0.0	-	3.9	-
All Vehicles (no classification)	80	190	0	0	-	270	191	0	33	0	-	224	30	67	130	20	-	247	0	0	30	0	-	30	771
% All Vehicles (no classification)	100.0	100.0	-	-	-	100.0	100.0	-	100.0	-	-	100.0	100.0	100.0	100.0	100.0	-	100.0	-	-	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-



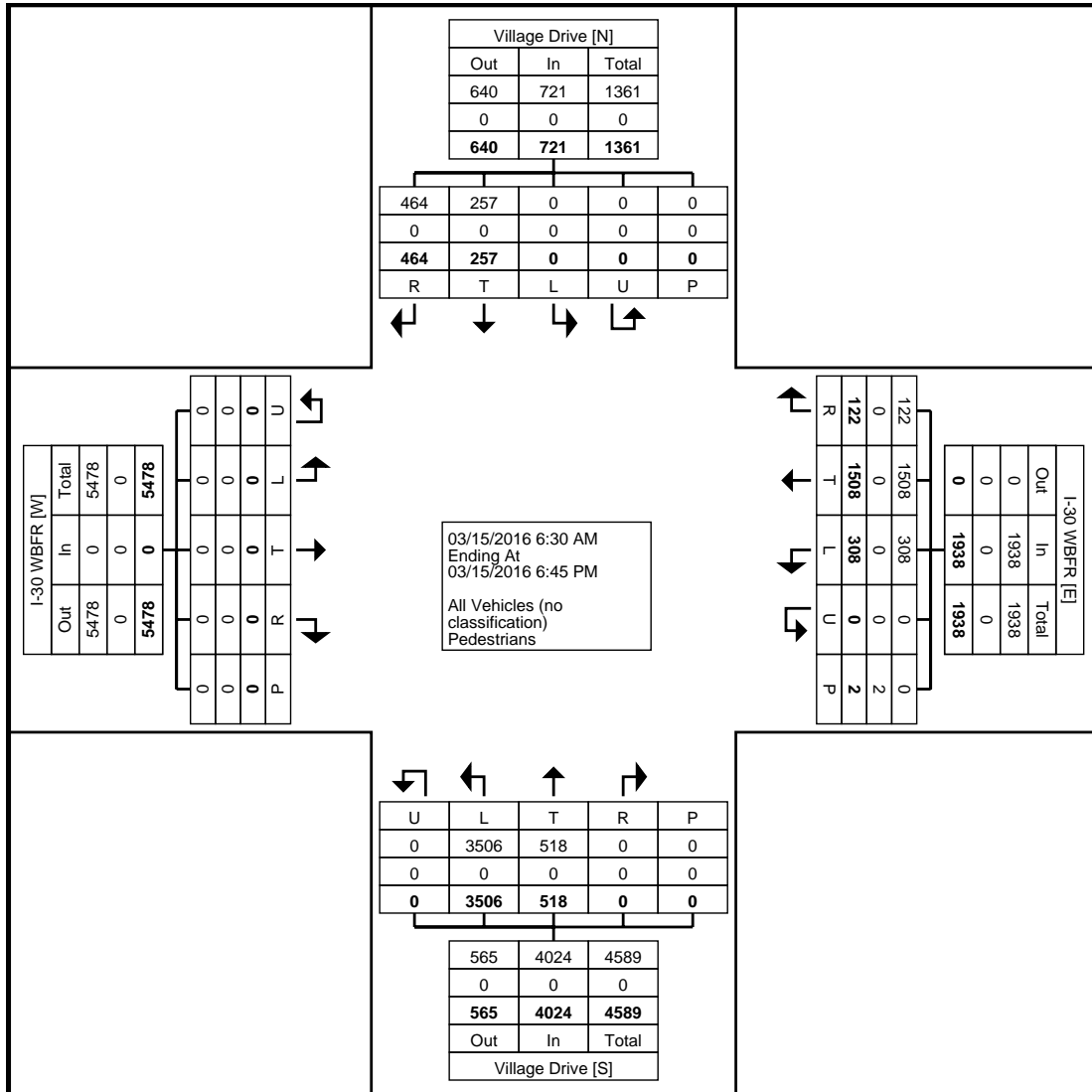
Turning Movement Data Plot

Turning Movement Peak Hour Data (6:45 AM)

Start Time	Village Drive Southbound						Laguna Drive Westbound						Village Drive Northbound						Driveway Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:45 AM	9	26	0	0	0	35	23	0	0	0	0	23	6	5	22	3	0	36	0	0	6	0	0	6	100
7:00 AM	8	24	0	0	0	32	20	0	2	0	1	22	3	5	18	7	0	33	0	0	3	0	0	3	90
7:15 AM	11	29	0	0	0	40	27	0	6	0	0	33	4	5	16	6	0	31	0	0	4	0	0	4	108
7:30 AM	18	21	0	0	0	39	25	0	4	0	0	29	13	13	22	1	0	49	0	0	13	0	0	13	130
Total	46	100	0	0	0	146	95	0	12	0	1	107	26	28	78	17	0	149	0	0	26	0	0	26	428
Approach %	31.5	68.5	0.0	0.0	-	-	88.8	0.0	11.2	0.0	-	-	17.4	18.8	52.3	11.4	-	-	0.0	0.0	100.0	0.0	-	-	-
Total %	10.7	23.4	0.0	0.0	-	34.1	22.2	0.0	2.8	0.0	-	25.0	6.1	6.5	18.2	4.0	-	34.8	0.0	0.0	6.1	0.0	-	6.1	-
PHF	0.639	0.862	0.000	0.000	-	0.913	0.880	0.000	0.500	0.000	-	0.811	0.500	0.538	0.886	0.607	-	0.760	0.000	0.000	0.500	0.000	-	0.500	0.823
All Vehicles (no classification)	46	100	0	0	-	146	95	0	12	0	-	107	26	28	78	17	-	149	0	0	26	0	-	26	428
% All Vehicles (no classification)	100.0	100.0	-	-	-	100.0	100.0	-	100.0	-	-	100.0	100.0	100.0	100.0	100.0	-	100.0	-	-	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

Count Name: Village Drive
(Horizon) at Laguna Drive (AM)
Site Code: 4
Start Date: 03/15/2016
Page No: 5



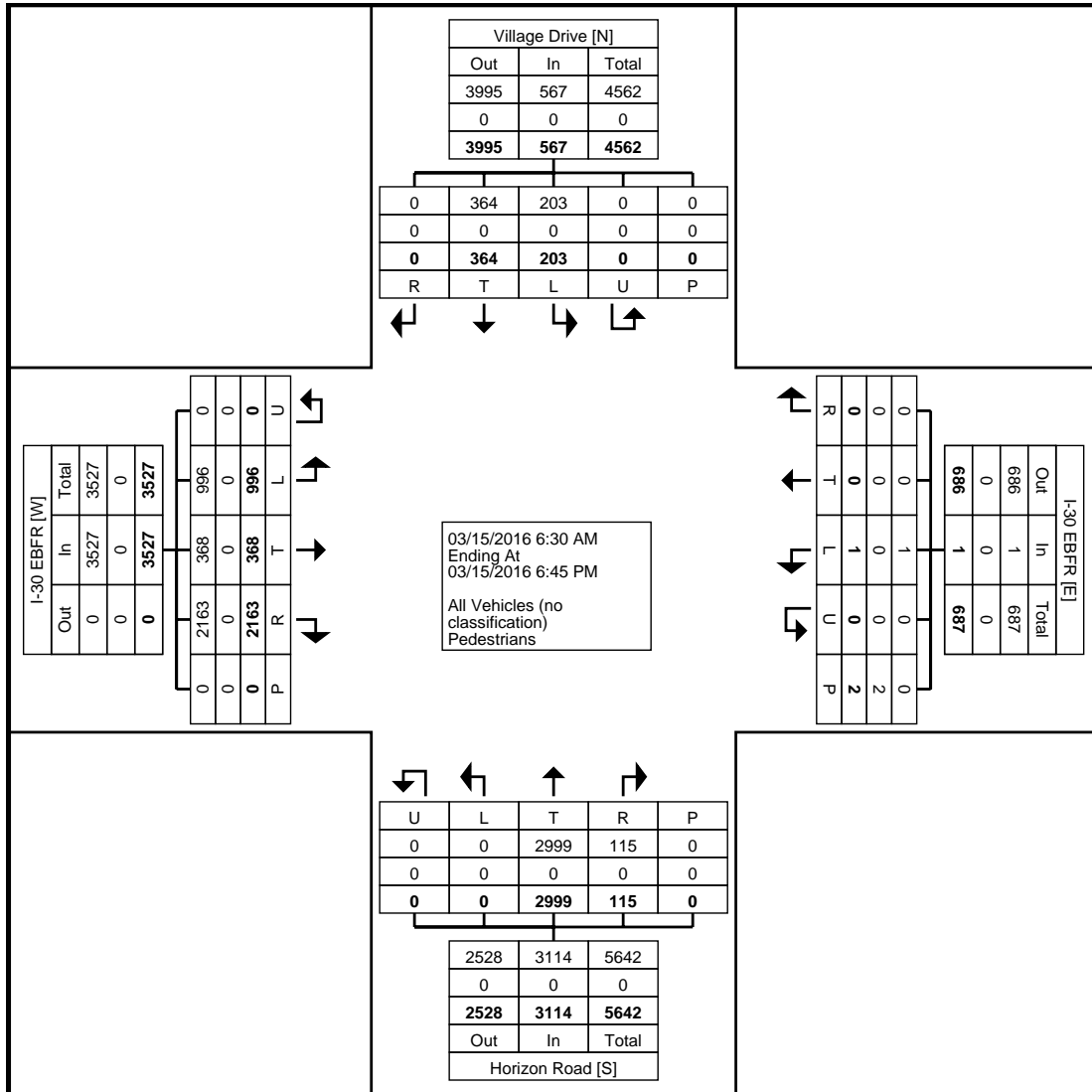
Turning Movement Data Plot

Turning Movement Peak Hour Data (7:00 AM)

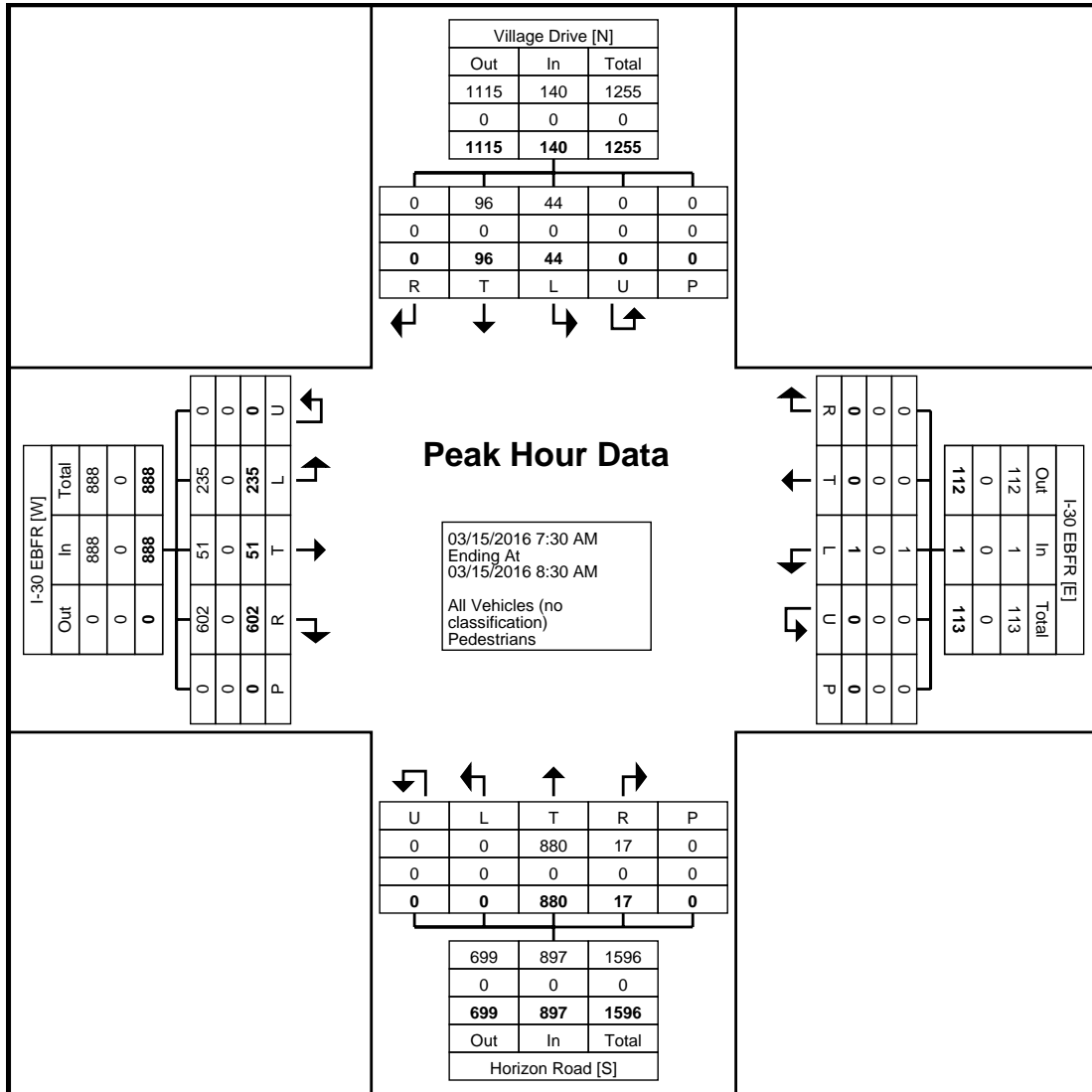
Start Time	Village Drive Southbound						I-30 WBFR Westbound						Village Drive Northbound						I-30 WBFR Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	5	53	0	0	58	3	97	2	0	0	102	227	30	0	0	0	257	0	0	0	0	0	0	417
7:15 AM	0	17	49	0	0	66	10	103	2	0	2	115	225	29	0	0	0	254	0	0	0	0	0	0	435
7:30 AM	0	14	45	0	0	59	16	79	4	0	0	99	276	45	0	0	0	321	0	0	0	0	0	0	479
7:45 AM	0	8	34	0	0	42	21	83	5	0	0	109	257	20	0	0	0	277	0	0	0	0	0	0	428
Total	0	44	181	0	0	225	50	362	13	0	2	425	985	124	0	0	0	1109	0	0	0	0	0	0	1759
Approach %	0.0	19.6	80.4	0.0	-	-	11.8	85.2	3.1	0.0	-	-	88.8	11.2	0.0	0.0	-	-	NaN	NaN	NaN	NaN	-	-	-
Total %	0.0	2.5	10.3	0.0	-	12.8	2.8	20.6	0.7	0.0	-	24.2	56.0	7.0	0.0	0.0	-	63.0	0.0	0.0	0.0	0.0	-	0.0	-
PHF	0.000	0.647	0.854	0.000	-	0.852	0.595	0.879	0.650	0.000	-	0.924	0.892	0.689	0.000	0.000	-	0.864	0.000	0.000	0.000	0.000	-	0.000	0.918
All Vehicles (no classification)	0	44	181	0	-	225	50	362	13	0	-	425	985	124	0	0	-	1109	0	0	0	0	-	0	1759
% All Vehicles (no classification)	-	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	100.0	-	-	-	100.0	-	-	-	-	-	-	100.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

Count Name: Village Drive
(Horizon) at I-30 WBFR
Site Code: 5
Start Date: 03/15/2016
Page No: 7



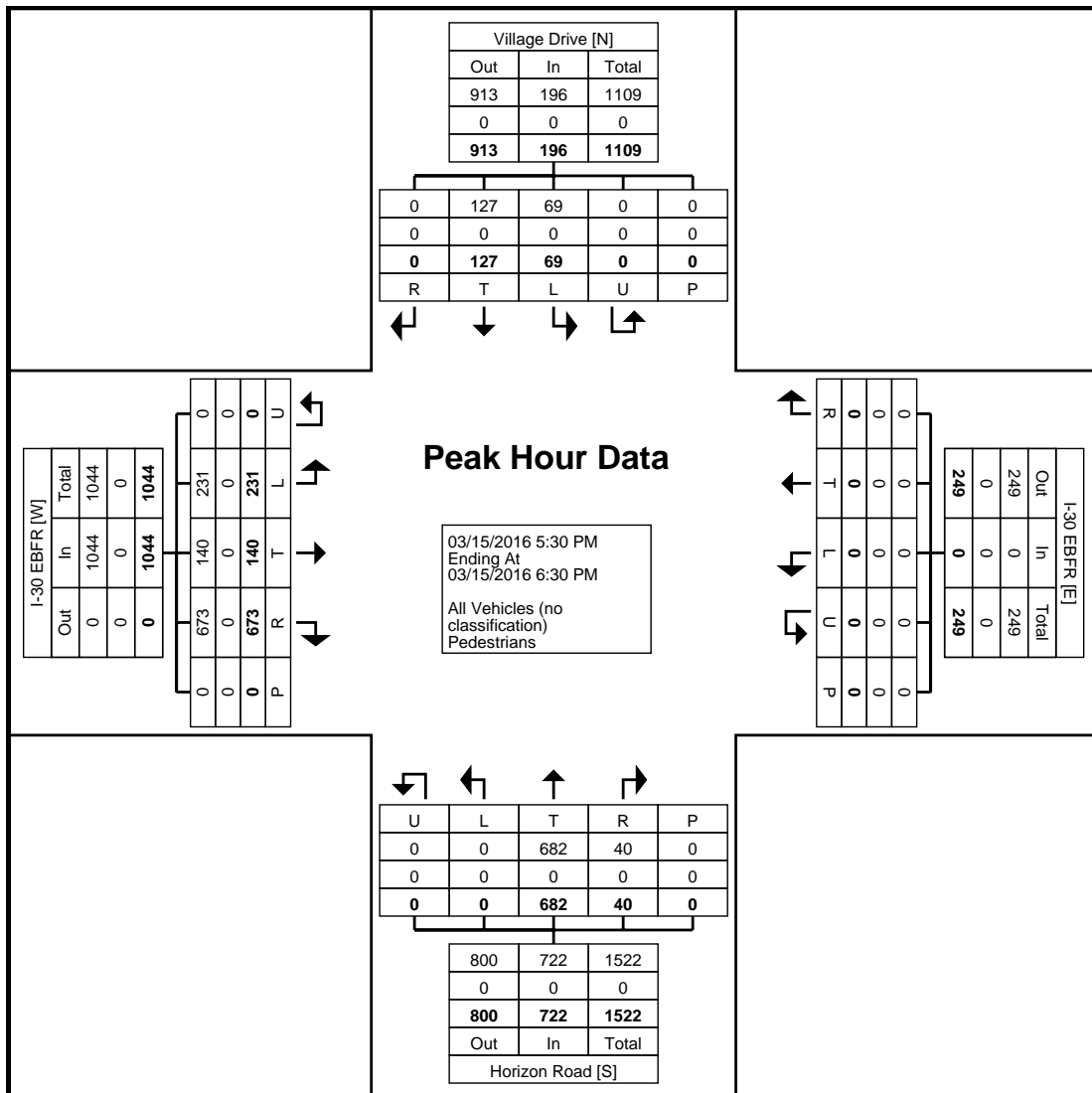
Turning Movement Data Plot



Turning Movement Peak Hour Data Plot (7:30 AM)

Turning Movement Peak Hour Data (5:30 PM)

Start Time	Village Drive Southbound						I-30 EBFR Westbound						Horizon Road Northbound						I-30 EBFR Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:30 PM	20	27	0	0	0	47	0	0	0	0	0	0	0	182	7	0	0	189	61	33	124	0	0	218	454
5:45 PM	17	30	0	0	0	47	0	0	0	0	0	0	0	178	10	0	0	188	46	25	124	0	0	195	430
6:00 PM	14	33	0	0	0	47	0	0	0	0	0	0	0	148	10	0	0	158	75	37	205	0	0	317	522
6:15 PM	18	37	0	0	0	55	0	0	0	0	0	0	0	174	13	0	0	187	49	45	220	0	0	314	556
Total	69	127	0	0	0	196	0	0	0	0	0	0	0	682	40	0	0	722	231	140	673	0	0	1044	1962
Approach %	35.2	64.8	0.0	0.0	-	-	NaN	NaN	NaN	NaN	-	-	0.0	94.5	5.5	0.0	-	-	22.1	13.4	64.5	0.0	-	-	-
Total %	3.5	6.5	0.0	0.0	-	10.0	0.0	0.0	0.0	0.0	-	0.0	0.0	34.8	2.0	0.0	-	36.8	11.8	7.1	34.3	0.0	-	53.2	-
PHF	0.863	0.858	0.000	0.000	-	0.891	0.000	0.000	0.000	0.000	-	0.000	0.000	0.937	0.769	0.000	-	0.955	0.770	0.778	0.765	0.000	-	0.823	0.882
All Vehicles (no classification)	69	127	0	0	-	196	0	0	0	0	-	0	0	682	40	0	-	722	231	140	673	0	-	1044	1962
% All Vehicles (no classification)	100.0	100.0	-	-	-	100.0	-	-	-	-	-	-	-	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



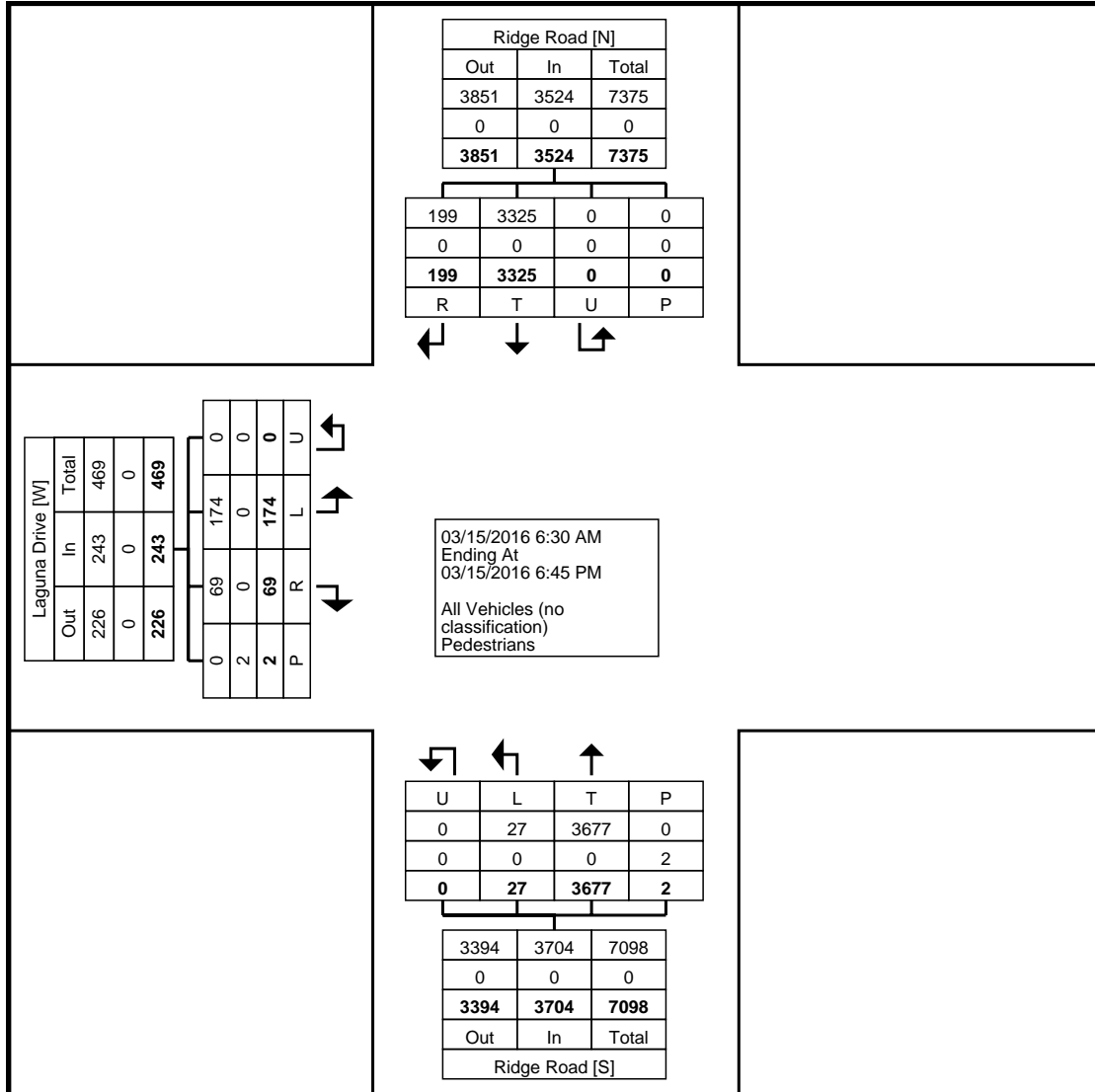
Turning Movement Peak Hour Data Plot (5:30 PM)

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

Count Name: Village Drive
(Horizon) at I-30 EBFR
Site Code: 6
Start Date: 03/15/2016
Page No: 7

Turning Movement Data

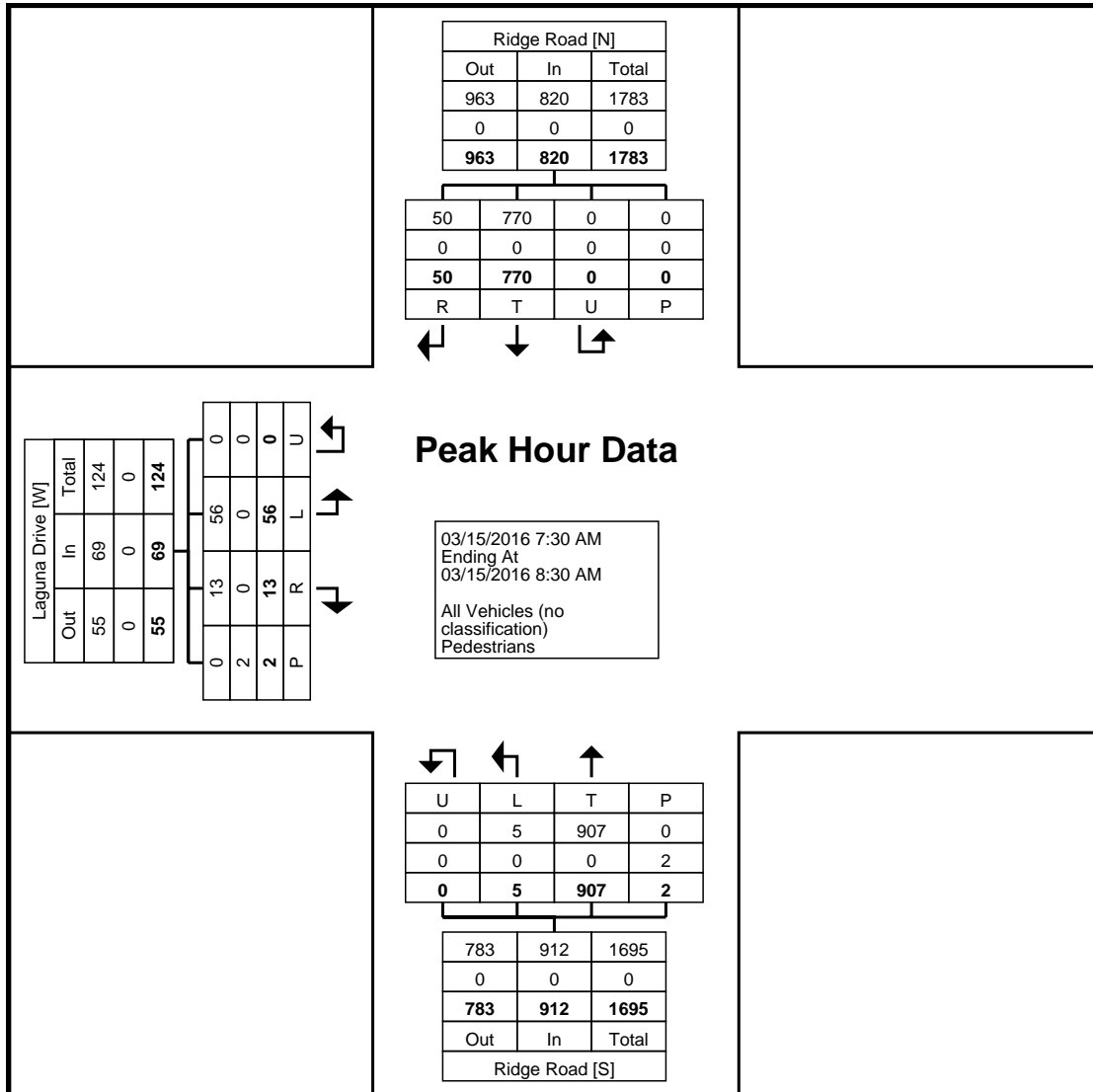
Start Time	Ridge Road Southbound					Ridge Road Northbound					Laguna Drive Eastbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
6:30 AM	93	4	0	0	97	0	88	0	0	88	3	1	0	0	4	189
6:45 AM	115	2	0	0	117	1	89	0	0	90	8	4	0	0	12	219
Hourly Total	208	6	0	0	214	1	177	0	0	178	11	5	0	0	16	408
7:00 AM	112	4	0	0	116	1	115	0	0	116	8	3	0	0	11	243
7:15 AM	139	9	0	0	148	2	124	0	0	126	17	2	0	0	19	293
7:30 AM	164	10	0	0	174	0	195	0	2	195	14	2	0	2	16	385
7:45 AM	188	15	0	0	203	0	241	0	0	241	24	3	0	0	27	471
Hourly Total	603	38	0	0	641	3	675	0	2	678	63	10	0	2	73	1392
8:00 AM	208	18	0	0	226	4	219	0	0	223	7	2	0	0	9	458
8:15 AM	210	7	0	0	217	1	252	0	0	253	11	6	0	0	17	487
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	418	25	0	0	443	5	471	0	0	476	18	8	0	0	26	945
4:30 PM	227	14	0	0	241	1	313	0	0	314	14	4	0	0	18	573
4:45 PM	261	14	0	0	275	1	313	0	0	314	11	3	0	0	14	603
Hourly Total	488	28	0	0	516	2	626	0	0	628	25	7	0	0	32	1176
5:00 PM	289	19	0	0	308	6	284	0	0	290	11	4	0	0	15	613
5:15 PM	251	24	0	0	275	3	292	0	0	295	12	3	0	0	15	585
5:30 PM	314	22	0	0	336	2	249	0	0	251	7	7	0	0	14	601
5:45 PM	277	11	0	0	288	0	281	0	0	281	10	8	0	0	18	587
Hourly Total	1131	76	0	0	1207	11	1106	0	0	1117	40	22	0	0	62	2386
6:00 PM	220	10	0	0	230	0	309	0	0	309	3	6	0	0	9	548
6:15 PM	257	16	0	0	273	5	313	0	0	318	14	11	0	0	25	616
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	3325	199	0	0	3524	27	3677	0	2	3704	174	69	0	2	243	7471
Approach %	94.4	5.6	0.0	-	-	0.7	99.3	0.0	-	-	71.6	28.4	0.0	-	-	-
Total %	44.5	2.7	0.0	-	47.2	0.4	49.2	0.0	-	49.6	2.3	0.9	0.0	-	3.3	-
All Vehicles (no classification)	3325	199	0	-	3524	27	3677	0	-	3704	174	69	0	-	243	7471
% All Vehicles (no classification)	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0
% Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



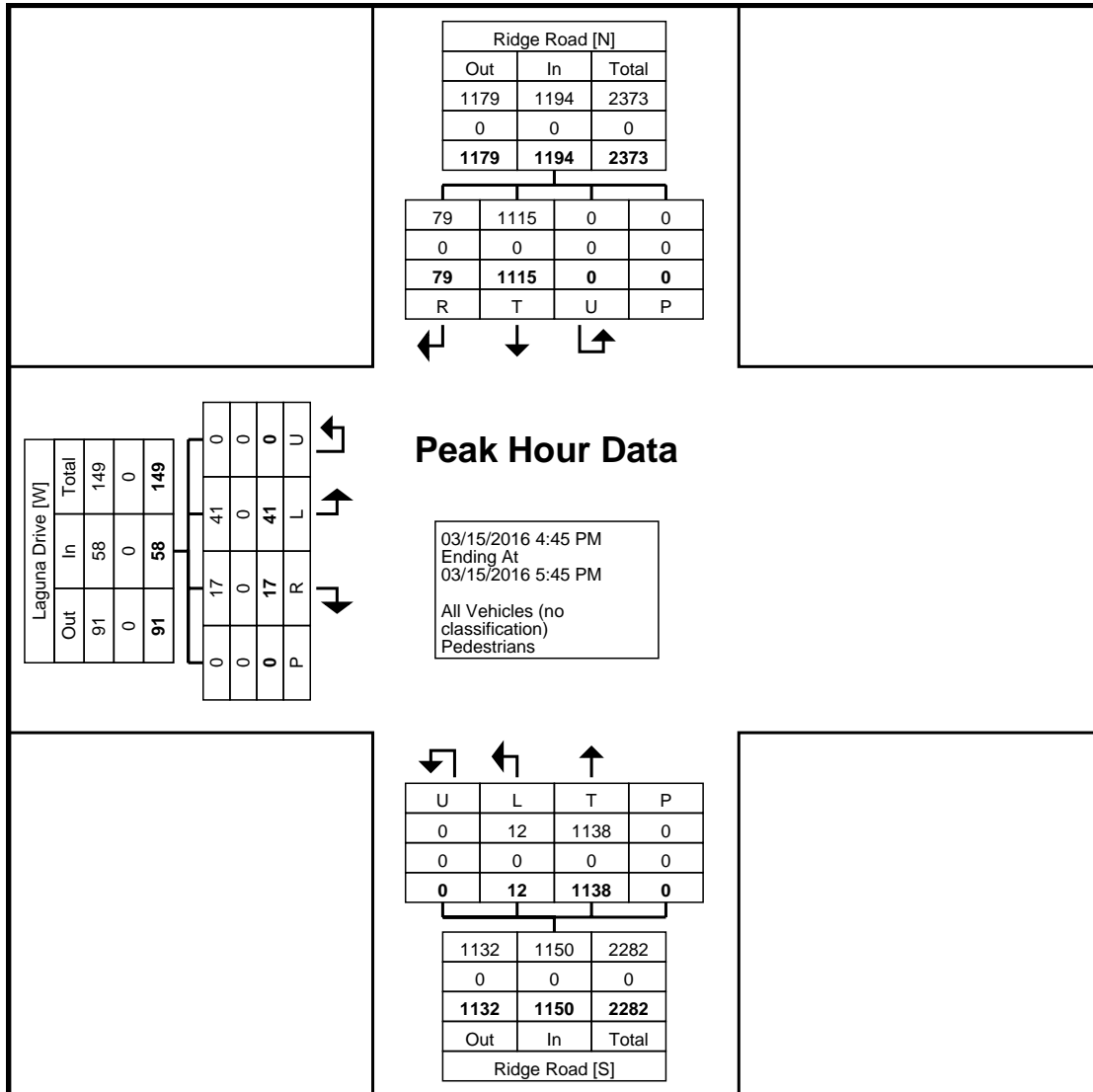
Turning Movement Data Plot

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Ridge Road Southbound					Ridge Road Northbound					Laguna Drive Eastbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:30 AM	164	10	0	0	174	0	195	0	2	195	14	2	0	2	16	385
7:45 AM	188	15	0	0	203	0	241	0	0	241	24	3	0	0	27	471
8:00 AM	208	18	0	0	226	4	219	0	0	223	7	2	0	0	9	458
8:15 AM	210	7	0	0	217	1	252	0	0	253	11	6	0	0	17	487
Total	770	50	0	0	820	5	907	0	2	912	56	13	0	2	69	1801
Approach %	93.9	6.1	0.0	-	-	0.5	99.5	0.0	-	-	81.2	18.8	0.0	-	-	-
Total %	42.8	2.8	0.0	-	45.5	0.3	50.4	0.0	-	50.6	3.1	0.7	0.0	-	3.8	-
PHF	0.917	0.694	0.000	-	0.907	0.313	0.900	0.000	-	0.901	0.583	0.542	0.000	-	0.639	0.925
All Vehicles (no classification)	770	50	0	-	820	5	907	0	-	912	56	13	0	-	69	1801
% All Vehicles (no classification)	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Turning Movement Peak Hour Data Plot (7:30 AM)



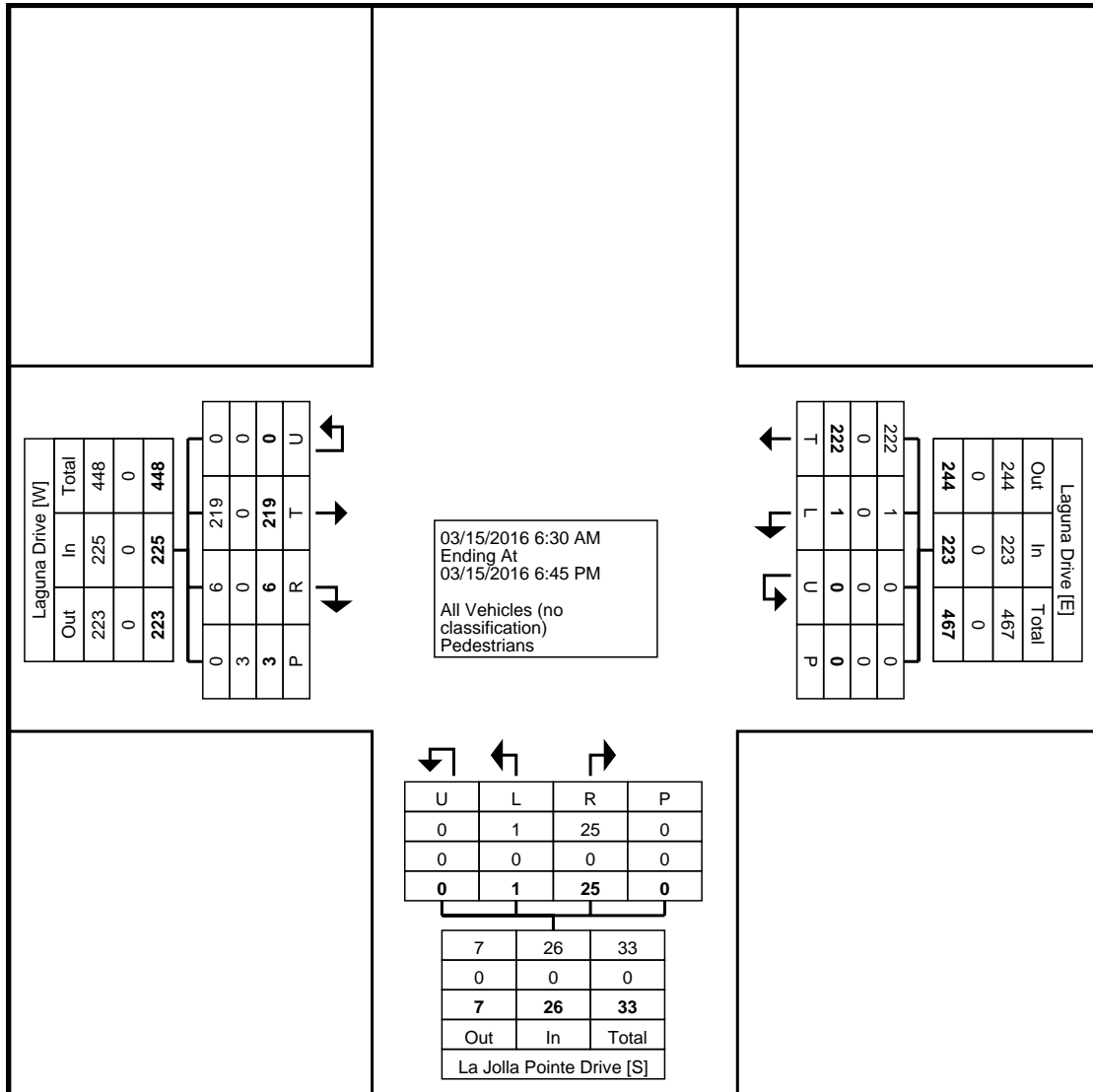
Turning Movement Peak Hour Data Plot (4:45 PM)

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

Count Name: Ridge Road at
Laguna Drive
Site Code: 1
Start Date: 03/15/2016
Page No: 7

Turning Movement Data

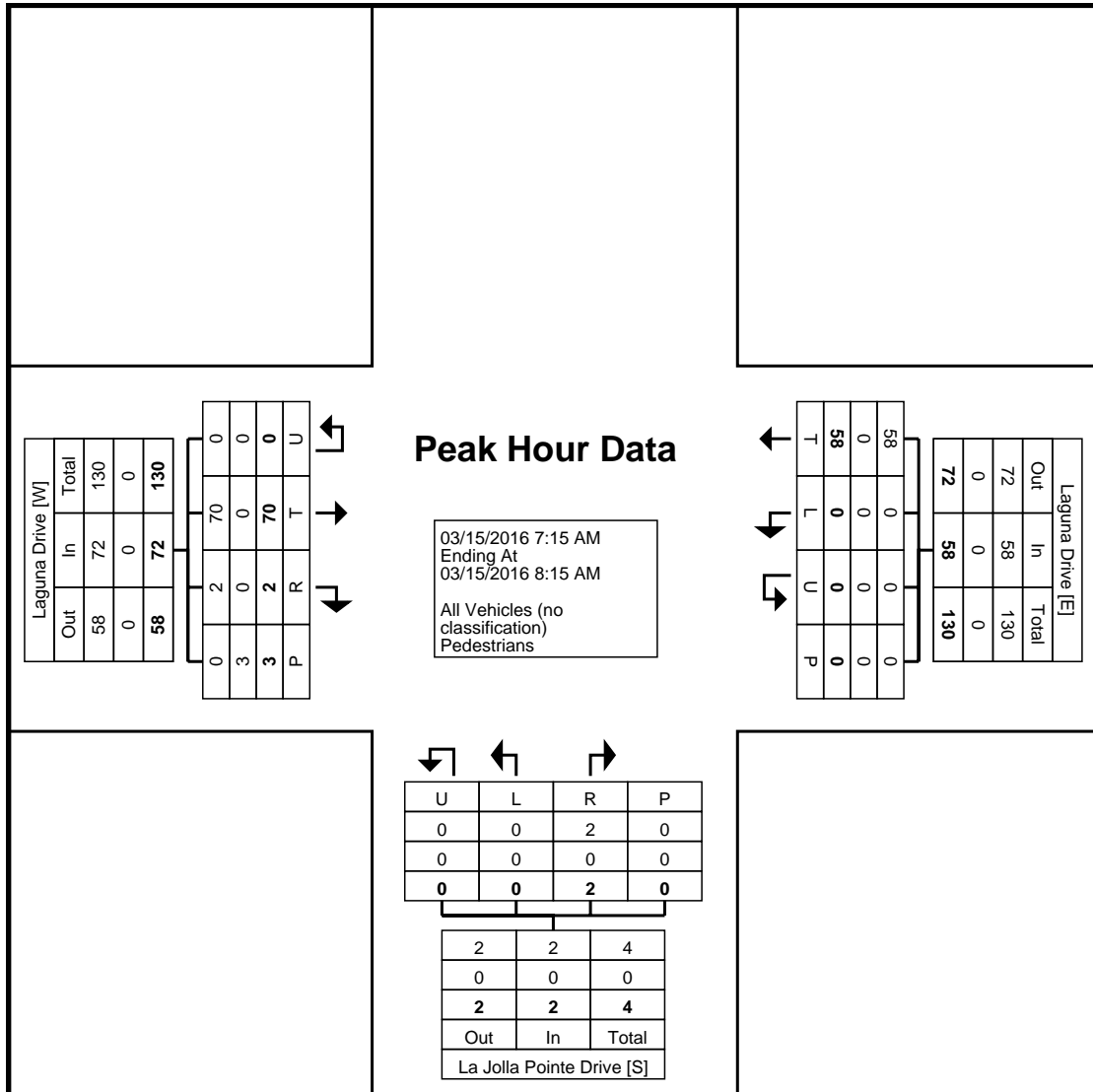
Start Time	Laguna Drive Westbound					La Jolla Pointe Drive Northbound					Laguna Drive Eastbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
6:30 AM	0	4	0	0	4	0	1	0	0	1	4	0	0	0	4	9
6:45 AM	0	3	0	0	3	0	2	0	0	2	10	0	0	0	10	15
Hourly Total	0	7	0	0	7	0	3	0	0	3	14	0	0	0	14	24
7:00 AM	0	5	0	0	5	0	0	0	0	0	10	0	0	0	10	15
7:15 AM	0	11	0	0	11	0	0	0	0	0	19	0	0	3	19	30
7:30 AM	0	10	0	0	10	0	1	0	0	1	19	1	0	0	20	31
7:45 AM	0	15	0	0	15	0	0	0	0	0	26	1	0	0	27	42
Hourly Total	0	41	0	0	41	0	1	0	0	1	74	2	0	3	76	118
8:00 AM	0	22	0	0	22	0	1	0	0	1	6	0	0	0	6	29
8:15 AM	1	8	0	0	9	0	1	0	0	1	16	0	0	0	16	26
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	1	30	0	0	31	0	2	0	0	2	22	0	0	0	22	55
4:30 PM	0	15	0	0	15	0	2	0	0	2	17	0	0	0	17	34
4:45 PM	0	13	0	0	13	0	3	0	0	3	10	0	0	0	10	26
Hourly Total	0	28	0	0	28	0	5	0	0	5	27	0	0	0	27	60
5:00 PM	0	26	0	0	26	0	2	0	0	2	15	2	0	0	17	45
5:15 PM	0	25	0	0	25	0	3	0	0	3	10	0	0	0	10	38
5:30 PM	0	24	0	0	24	1	2	0	0	3	13	1	0	0	14	41
5:45 PM	0	12	0	0	12	0	0	0	0	0	16	0	0	0	16	28
Hourly Total	0	87	0	0	87	1	7	0	0	8	54	3	0	0	57	152
6:00 PM	0	10	0	0	10	0	1	0	0	1	11	1	0	0	12	23
6:15 PM	0	19	0	0	19	0	6	0	0	6	17	0	0	0	17	42
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	222	0	0	223	1	25	0	0	26	219	6	0	3	225	474
Approach %	0.4	99.6	0.0	-	-	3.8	96.2	0.0	-	-	97.3	2.7	0.0	-	-	-
Total %	0.2	46.8	0.0	-	47.0	0.2	5.3	0.0	-	5.5	46.2	1.3	0.0	-	47.5	-
All Vehicles (no classification)	1	222	0	-	223	1	25	0	-	26	219	6	0	-	225	474
% All Vehicles (no classification)	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



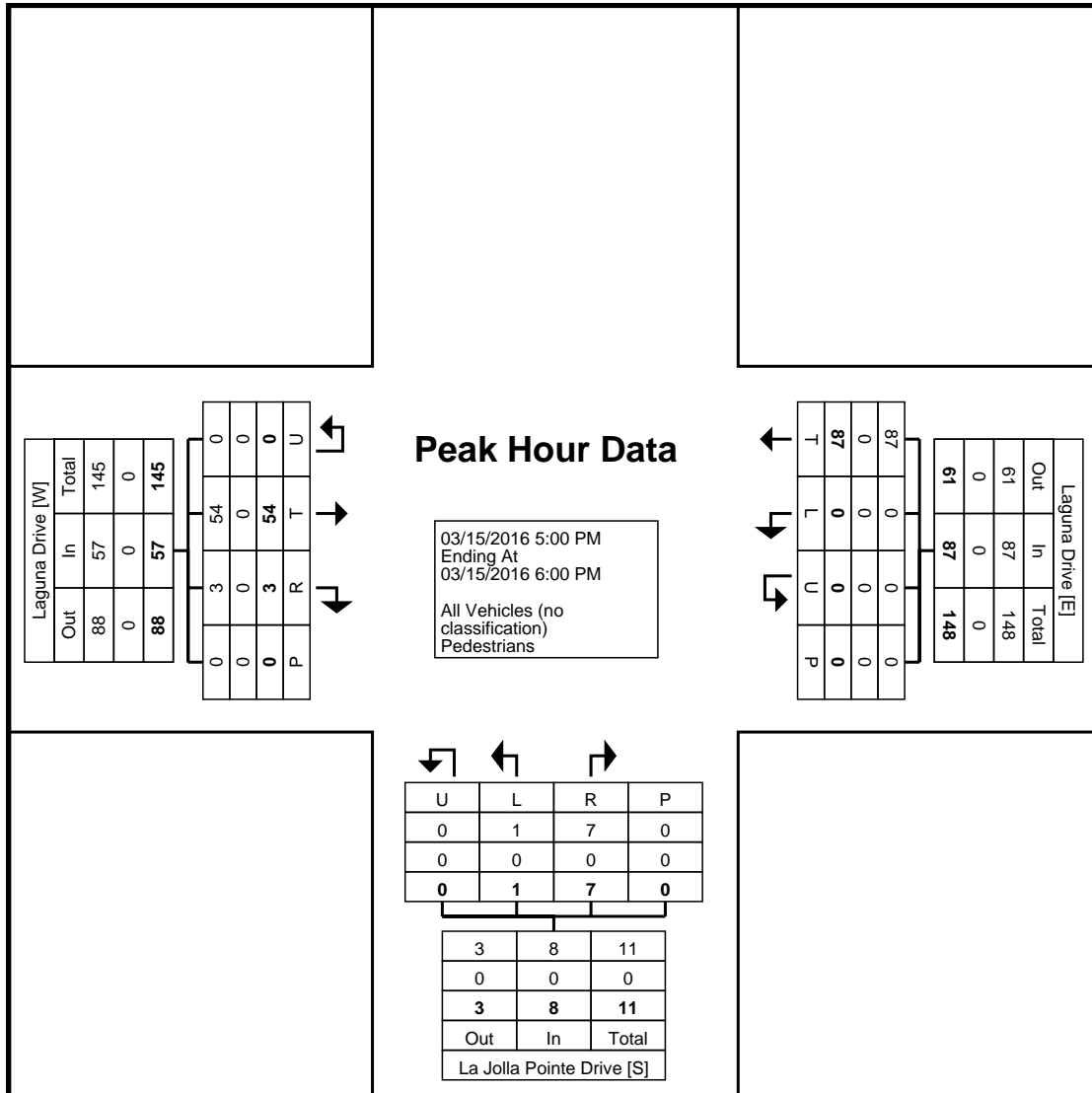
Turning Movement Data Plot

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Laguna Drive Westbound					La Jolla Pointe Drive Northbound					Laguna Drive Eastbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	0	11	0	0	11	0	0	0	0	0	19	0	0	3	19	30
7:30 AM	0	10	0	0	10	0	1	0	0	1	19	1	0	0	20	31
7:45 AM	0	15	0	0	15	0	0	0	0	0	26	1	0	0	27	42
8:00 AM	0	22	0	0	22	0	1	0	0	1	6	0	0	0	6	29
Total	0	58	0	0	58	0	2	0	0	2	70	2	0	3	72	132
Approach %	0.0	100.0	0.0	-	-	0.0	100.0	0.0	-	-	97.2	2.8	0.0	-	-	-
Total %	0.0	43.9	0.0	-	43.9	0.0	1.5	0.0	-	1.5	53.0	1.5	0.0	-	54.5	-
PHF	0.000	0.659	0.000	-	0.659	0.000	0.500	0.000	-	0.500	0.673	0.500	0.000	-	0.667	0.786
All Vehicles (no classification)	0	58	0	-	58	0	2	0	-	2	70	2	0	-	72	132
% All Vehicles (no classification)	-	100.0	-	-	100.0	-	100.0	-	-	100.0	100.0	100.0	-	-	100.0	100.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



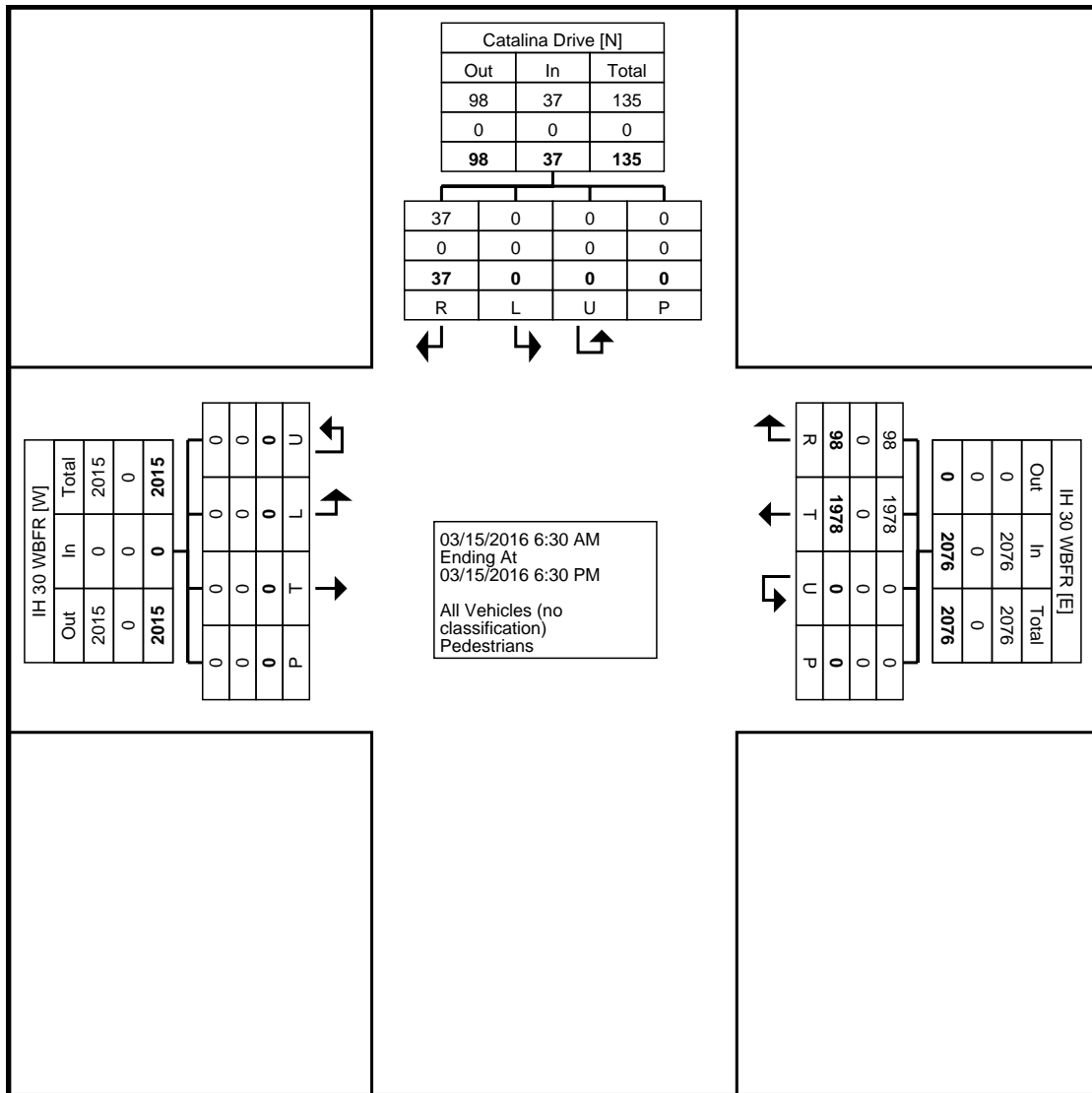
Turning Movement Peak Hour Data Plot (7:15 AM)



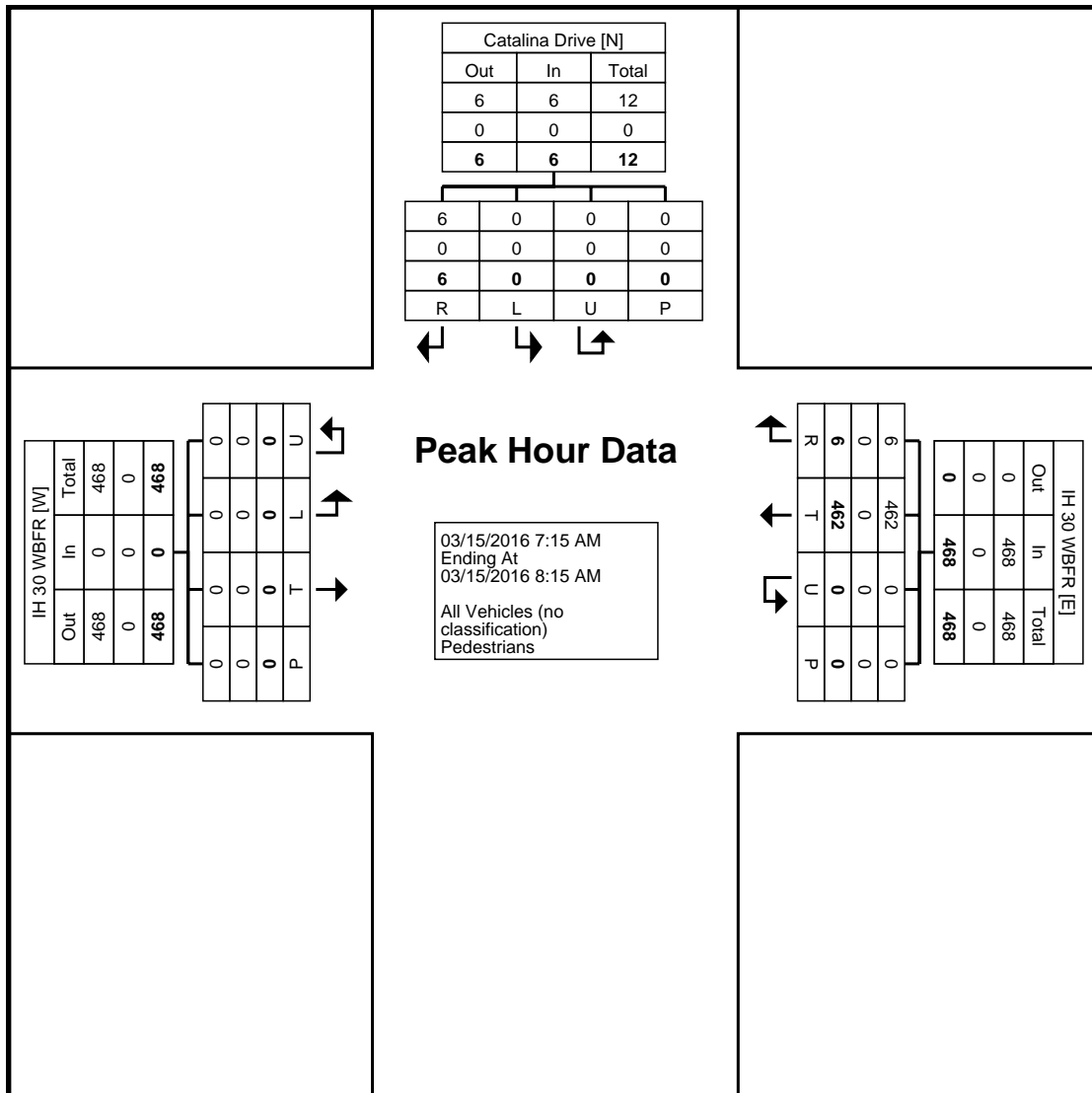
Turning Movement Peak Hour Data Plot (5:00 PM)

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

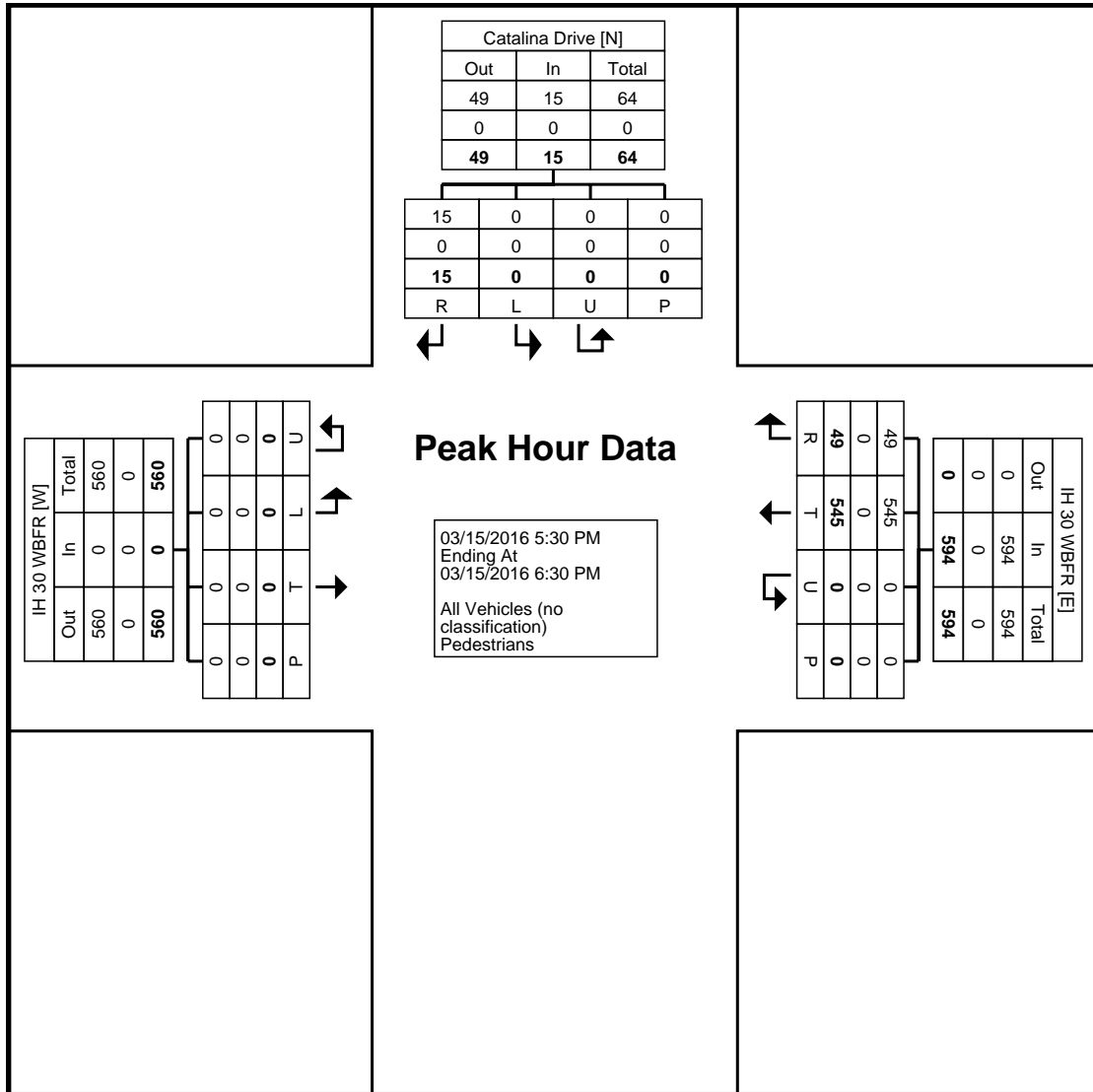
Count Name: Laguna Drive at
La Jolla Pointe Drive
Site Code: 3
Start Date: 03/15/2016
Page No: 7



Turning Movement Data Plot



Turning Movement Peak Hour Data Plot (7:15 AM)



Turning Movement Peak Hour Data Plot (5:30 PM)

Lee Engineering
5215 Sycamore Ave
Pasadena, Texas, United States 77503
555-555-5555

Count Name: La Jolla Pointe
Drive (Catalina Drive) at IH 30
WBFR
Site Code: 2
Start Date: 03/15/2016
Page No: 7

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	95	0	12	43	28	78	48	100	0
Future Vol, veh/h	0	0	0	95	0	12	43	28	78	48	100	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	103	0	13	47	30	85	52	109	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	379	422	109	379	379	73	109	0	0	115	0	0
Stage 1	213	213	-	166	166	-	-	-	-	-	-	-
Stage 2	166	209	-	213	213	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	499	444	925	604	577	993	1481	-	-	1474	-	-
Stage 1	726	668	-	852	775	-	-	-	-	-	-	-
Stage 2	784	672	-	808	744	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	466	413	925	571	536	993	1481	-	-	1474	-	-
Mov Cap-2 Maneuver	466	413	-	571	536	-	-	-	-	-	-	-
Stage 1	701	643	-	823	749	-	-	-	-	-	-	-
Stage 2	747	649	-	777	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.3	2.2	2.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	-	571	993	1474	-	-
HCM Lane V/C Ratio	0.032	-	-	-	0.181	0.013	0.035	-	-
HCM Control Delay (s)	7.5	0	-	0	12.7	8.7	7.5	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	0	0.1	-	-

Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	85	416	20	1107	182	282
v/c Ratio	0.24	1.12	0.05	1.03	0.17	0.87dr
Control Delay	38.9	122.8	0.2	32.2	6.7	42.3
Queue Delay	0.0	0.0	0.0	4.3	0.0	0.0
Total Delay	38.9	122.8	0.2	36.5	6.7	42.3
Queue Length 50th (ft)	51	~337	0	~254	28	70
Queue Length 95th (ft)	61	#504	0	m230	m23	70
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	355	373	418	1076	1044	407
Starvation Cap Reductn	0	0	0	13	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	1.12	0.05	1.04	0.17	0.69

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

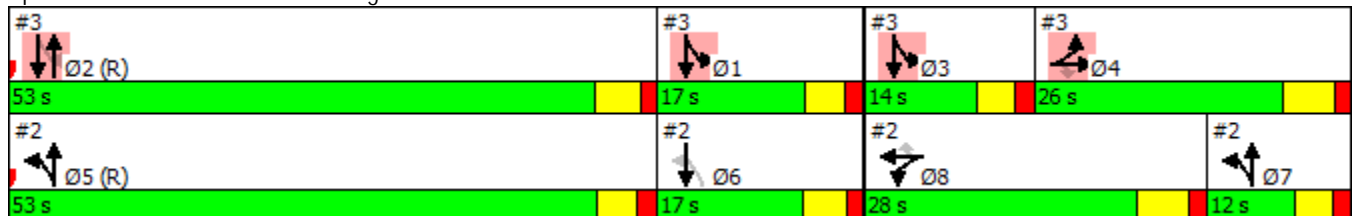


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↑	↗	↕↑	↖	↘	↕						
Traffic Volume (vph)	51	602	880	17	44	96						
Future Volume (vph)	51	602	880	17	44	96						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	26.0	26.0	53.0	53.0			17.0	14.0	53.0	17.0	12.0	28.0
Total Split (%)	23.6%	23.6%	48.2%	48.2%			15%	13%	48%	15%	11%	25%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	Max
Act Effect Green (s)	22.5	22.5	47.9	47.9	72.2	77.0						
Actuated g/C Ratio	0.20	0.20	0.44	0.44	0.66	0.70						
v/c Ratio	0.55	0.83	1.12	0.03	0.15	0.09						
Control Delay	42.9	12.1	99.4	0.1	26.5	15.6						
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0						
Total Delay	42.9	12.1	99.5	0.1	26.5	15.6						
LOS	D	B	F	A	C	B						
Approach Delay	22.2		97.2			19.7						
Approach LOS	C		F			B						

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 55.6
 Intersection LOS: E
 Intersection Capacity Utilization 92.0%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	366	743	1023	24	68	112
v/c Ratio	0.55	0.83	1.12	0.03	0.15	0.09
Control Delay	42.9	12.1	99.4	0.1	26.5	15.6
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	42.9	12.1	99.5	0.1	26.5	15.6
Queue Length 50th (ft)	122	0	~744	0	29	47
Queue Length 95th (ft)	122	40	#897	0	39	m72
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	661	898	913	794	485	1327
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	17	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.83	1.14	0.03	0.14	0.08

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	70	2	0	2	0	58
Future Vol, veh/h	70	2	0	2	0	58
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	2	0	2	0	63

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	34	32	63
Stage 1	32	-	-
Stage 2	2	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	987	1046	1540
Stage 1	998	-	-
Stage 2	1022	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	987	1046	1540
Mov Cap-2 Maneuver	987	-	-
Stage 1	998	-	-
Stage 2	1022	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1540	-	989	-	-
HCM Lane V/C Ratio	-	-	0.079	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	462	6	0	6
Future Vol, veh/h	0	0	462	6	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	502	7	0	7

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	9.9
HCM LOS		A

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	734
HCM Lane V/C Ratio	-	-	0.009
HCM Control Delay (s)	-	-	9.9
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	6	807	770	60	56	13
Future Vol, veh/h	6	807	770	60	56	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	877	837	65	61	14

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	902	0	1322
Stage 1	-	-	870
Stage 2	-	-	452
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	749	-	148
Stage 1	-	-	370
Stage 2	-	-	608
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	749	-	145
Mov Cap-2 Maneuver	-	-	269
Stage 1	-	-	370
Stage 2	-	-	597

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	749	-	-	-	269	556
HCM Lane V/C Ratio	0.009	-	-	-	0.226	0.025
HCM Control Delay (s)	9.8	0.1	-	-	22.3	11.6
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.1

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	13	60	2	49	22	99	64	30	85	0
Future Vol, veh/h	0	2	13	60	2	49	22	99	64	30	85	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	14	65	2	53	24	108	70	33	92	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	349	383	92	356	348	142	92	0	0	177	0	0
Stage 1	158	158	-	190	190	-	-	-	-	-	-	-
Stage 2	191	225	-	166	158	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	529	474	948	623	598	913	1503	-	-	1399	-	-
Stage 1	794	721	-	829	759	-	-	-	-	-	-	-
Stage 2	753	657	-	852	781	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	481	454	948	592	573	913	1503	-	-	1399	-	-
Mov Cap-2 Maneuver	481	454	-	592	573	-	-	-	-	-	-	-
Stage 1	780	703	-	814	745	-	-	-	-	-	-	-
Stage 2	694	645	-	816	761	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	10.7	0.9	2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	828	591	913	1399	-	-
HCM Lane V/C Ratio	0.016	-	-	0.02	0.114	0.058	0.023	-	-
HCM Control Delay (s)	7.4	0	-	9.4	11.9	9.2	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.2	0.1	-	-

Timings

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016

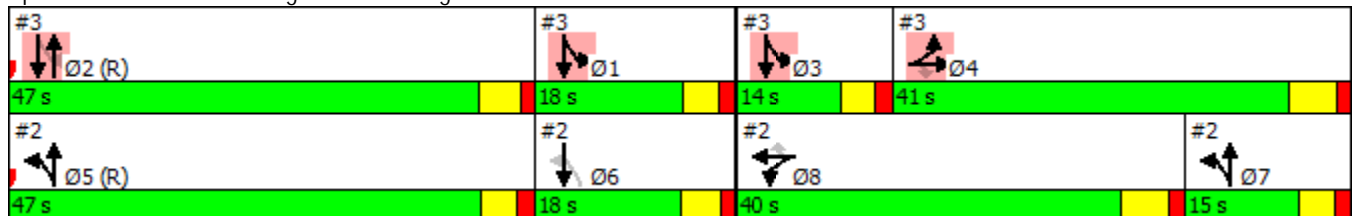


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7
Lane Configurations	↔	↑	↔	↔	↑	↑↔						
Traffic Volume (vph)	85	426	42	886	146	79						
Future Volume (vph)	85	426	42	886	146	79						
Turn Type	Split	NA	Perm	D,P+P	NA	NA						
Protected Phases	8	8		5 7	5 7	6	1	2	3	4	5	7
Permitted Phases				8	6							
Detector Phase	8	8	8	5 7	5 7	6						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.7			12.0	11.8	12.1	11.8	12.7	11.8	11.8
Total Split (s)	40.0	40.0	40.0			18.0	18.0	47.0	14.0	41.0	47.0	15.0
Total Split (%)	33.3%	33.3%	33.3%			15.0%	15%	39%	12%	34%	39%	13%
Yellow Time (s)	4.3	4.3	4.3			3.6	3.2	3.9	3.2	4.3	3.2	3.2
All-Red Time (s)	1.4	1.4	1.4			1.4	1.6	1.2	1.6	1.4	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0			0.0						
Total Lost Time (s)	5.7	5.7	5.7			5.0						
Lead/Lag	Lead	Lead	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None			Max	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	30.9	30.9	30.9	73.8	60.6	13.0						
Actuated g/C Ratio	0.26	0.26	0.26	0.62	0.50	0.11						
v/c Ratio	0.26	0.94	0.13	0.92	0.17	0.50						
Control Delay	36.0	73.0	0.9	21.4	10.2	29.4						
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0						
Total Delay	36.0	73.0	0.9	21.4	10.2	29.4						
LOS	D	E	A	C	B	C						
Approach Delay		58.8			19.8	29.4						
Approach LOS		E			B	C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 33.4
 Intersection LOS: C
 Intersection Capacity Utilization 90.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: Village/Horizon/Village & IH 30 WBFR



Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	116	448	64	943	160	217
v/c Ratio	0.26	0.94	0.13	0.92	0.17	0.50
Control Delay	36.0	73.0	0.9	21.4	10.2	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	73.0	0.9	21.4	10.2	29.4
Queue Length 50th (ft)	70	333	0	257	48	42
Queue Length 95th (ft)	94	#502	0	m#753	m61	56
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	500	527	530	1023	963	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.85	0.12	0.92	0.17	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

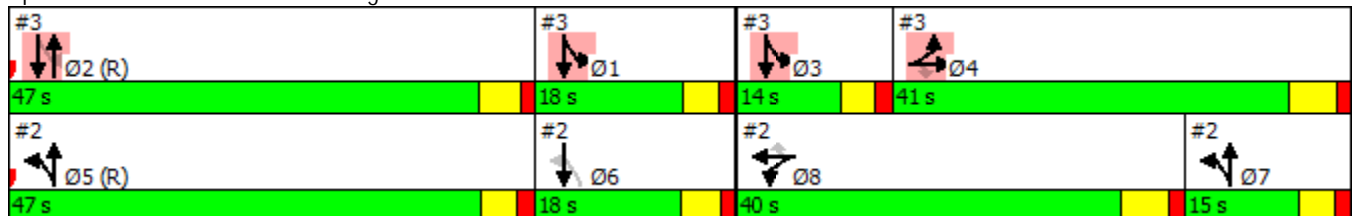


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↔	↗	↕↕	↗	↖	↕						
Traffic Volume (vph)	140	673	682	40	69	127						
Future Volume (vph)	140	673	682	40	69	127						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	41.0	41.0	47.0	47.0			18.0	14.0	47.0	18.0	15.0	40.0
Total Split (%)	34.2%	34.2%	39.2%	39.2%			15%	12%	39%	15%	13%	33%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	None
Act Effect Green (s)	37.5	37.5	41.9	41.9	67.2	72.0						
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.56	0.60						
v/c Ratio	0.47	0.87	0.96	0.07	0.23	0.15						
Control Delay	35.1	16.1	62.6	0.2	37.5	23.3						
Queue Delay	0.0	0.0	2.8	0.0	0.0	0.0						
Total Delay	35.1	16.1	65.4	0.2	37.5	23.3						
LOS	D	B	E	A	D	C						
Approach Delay	22.8		61.7			28.5						
Approach LOS	C		E			C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 36.0
 Intersection LOS: D
 Intersection Capacity Utilization 90.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	479	874	726	44	96	167
v/c Ratio	0.47	0.87	0.96	0.07	0.23	0.15
Control Delay	35.1	16.1	62.6	0.2	37.5	23.3
Queue Delay	0.0	0.0	2.8	0.0	0.0	0.0
Total Delay	35.1	16.1	65.4	0.2	37.5	23.3
Queue Length 50th (ft)	157	57	470	0	46	81
Queue Length 95th (ft)	175	59	#684	0	61	100
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	1019	1002	758	662	458	1140
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	14	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.87	0.98	0.07	0.21	0.15

Intersection Summary

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

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	54	3	1	7	0	87
Future Vol, veh/h	54	3	1	7	0	87
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	3	1	8	0	95

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	57	47	95
Stage 1	47	-	-
Stage 2	10	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	963	1028	1499
Stage 1	986	-	-
Stage 2	1015	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	962	1028	1499
Mov Cap-2 Maneuver	962	-	-
Stage 1	986	-	-
Stage 2	1014	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1499	-	965	-	-
HCM Lane V/C Ratio	0.001	-	0.064	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	545	49	0	15
Future Vol, veh/h	0	0	545	49	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	592	53	0	16

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10.4
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	684
HCM Lane V/C Ratio	-	-	0.024
HCM Control Delay (s)	-	-	10.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	12	1138	1116	79	41	17
Future Vol, veh/h	12	1138	1116	79	41	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	1237	1213	86	45	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1299	0	649
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	529	-	412
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	529	-	412
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	29.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	529	-	-	-	162	412
HCM Lane V/C Ratio	0.025	-	-	-	0.275	0.045
HCM Control Delay (s)	12	0.5	-	-	35.4	14.1
HCM Lane LOS	B	A	-	-	E	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1	0.1

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	97	0	12	44	29	80	48	100	0
Future Vol, veh/h	0	0	0	97	0	12	44	29	80	48	100	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	105	0	13	48	32	87	52	109	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	384	427	109	384	384	75	109	0	0	118	0	0
Stage 1	213	213	-	171	171	-	-	-	-	-	-	-
Stage 2	171	214	-	213	213	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	495	440	925	599	573	991	1481	-	-	1470	-	-
Stage 1	726	668	-	847	772	-	-	-	-	-	-	-
Stage 2	777	668	-	808	744	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	462	408	925	566	532	991	1481	-	-	1470	-	-
Mov Cap-2 Maneuver	462	408	-	566	532	-	-	-	-	-	-	-
Stage 1	701	643	-	817	745	-	-	-	-	-	-	-
Stage 2	740	645	-	777	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.3	2.2	2.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	-	566	991	1470	-	-
HCM Lane V/C Ratio	0.032	-	-	-	0.186	0.013	0.035	-	-
HCM Control Delay (s)	7.5	0	-	0	12.8	8.7	7.5	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	0	0.1	-	-

Timings

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016

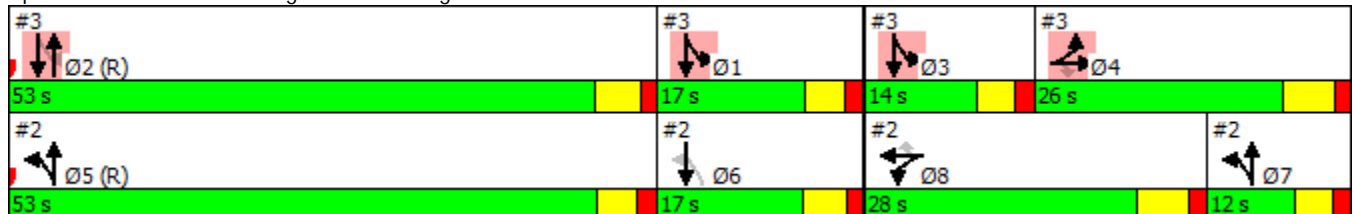


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7
Lane Configurations	↖	↑	↗	↖	↑	↗						
Traffic Volume (vph)	51	369	13	1005	126	45						
Future Volume (vph)	51	369	13	1005	126	45						
Turn Type	Split	NA	Perm	D,P+P	NA	NA						
Protected Phases	8	8		5 7	5 7	6	1	2	3	4	5	7
Permitted Phases			8	6								
Detector Phase	8	8	8	5 7	5 7	6						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.7			12.0	11.8	12.1	11.8	12.7	11.8	11.8
Total Split (s)	28.0	28.0	28.0			17.0	17.0	53.0	14.0	26.0	53.0	12.0
Total Split (%)	25.5%	25.5%	25.5%			15.5%	15%	48%	13%	24%	48%	11%
Yellow Time (s)	4.3	4.3	4.3			3.6	3.2	3.9	3.2	4.3	3.2	3.2
All-Red Time (s)	1.4	1.4	1.4			1.4	1.6	1.2	1.6	1.4	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0			0.0						
Total Lost Time (s)	5.7	5.7	5.7			5.0						
Lead/Lag	Lead	Lead	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max			Max	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	22.3	22.3	22.3	72.4	60.2	12.0						
Actuated g/C Ratio	0.20	0.20	0.20	0.66	0.55	0.11						
v/c Ratio	0.24	1.14	0.05	1.05	0.18	0.90dr						
Control Delay	39.0	129.8	0.2	37.4	6.6	44.7						
Queue Delay	0.0	0.0	0.0	5.3	0.0	0.0						
Total Delay	39.0	129.8	0.2	42.7	6.6	44.7						
LOS	D	F	A	D	A	D						
Approach Delay		110.2			37.7	44.7						
Approach LOS		F			D	D						

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 56.6
 Intersection LOS: E
 Intersection Capacity Utilization 93.7%
 ICU Level of Service F
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 2: Village/Horizon/Village & IH 30 WBFR



Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	86	424	20	1129	185	288
v/c Ratio	0.24	1.14	0.05	1.05	0.18	0.90dr
Control Delay	39.0	129.8	0.2	37.4	6.6	44.7
Queue Delay	0.0	0.0	0.0	5.3	0.0	0.0
Total Delay	39.0	129.8	0.2	42.7	6.6	44.7
Queue Length 50th (ft)	51	~349	0	~789	28	75
Queue Length 95th (ft)	61	#517	0	m237	m23	74
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	355	373	418	1073	1044	402
Starvation Cap Reductn	0	0	0	14	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	1.14	0.05	1.07	0.18	0.72

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

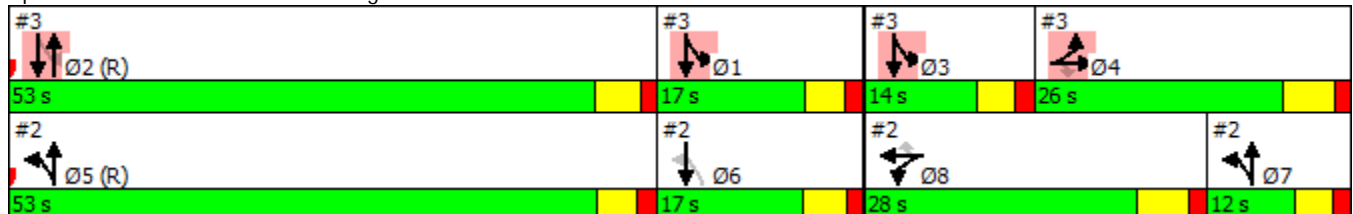


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↕	↗	↕↕	↗	↖	↕						
Traffic Volume (vph)	52	614	898	17	45	98						
Future Volume (vph)	52	614	898	17	45	98						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	26.0	26.0	53.0	53.0			17.0	14.0	53.0	17.0	12.0	28.0
Total Split (%)	23.6%	23.6%	48.2%	48.2%			15%	13%	48%	15%	11%	25%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	Max
Act Effct Green (s)	22.5	22.5	47.9	47.9	72.2	77.0						
Actuated g/C Ratio	0.20	0.20	0.44	0.44	0.66	0.70						
v/c Ratio	0.87dl	0.83	1.14	0.03	0.15	0.09						
Control Delay	43.4	12.2	108.1	0.1	26.6	15.5						
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0						
Total Delay	43.4	12.2	108.2	0.1	26.6	15.5						
LOS	D	B	F	A	C	B						
Approach Delay	22.6		105.8			19.7						
Approach LOS	C		F			B						

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 59.6
 Intersection LOS: E
 Intersection Capacity Utilization 93.7%
 ICU Level of Service F
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	378	758	1044	24	69	114
v/c Ratio	0.87dl	0.83	1.14	0.03	0.15	0.09
Control Delay	43.4	12.2	108.1	0.1	26.6	15.5
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	43.4	12.2	108.2	0.1	26.6	15.5
Queue Length 50th (ft)	127	0	~772	0	28	47
Queue Length 95th (ft)	126	39	#924	0	39	m72
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	661	910	913	794	485	1327
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	19	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.83	1.17	0.03	0.14	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	71	2	0	2	0	59
Future Vol, veh/h	71	2	0	2	0	59
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	2	0	2	0	64

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	34	32	64
Stage 1	32	-	-
Stage 2	2	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	987	1046	1538
Stage 1	998	-	-
Stage 2	1022	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	987	1046	1538
Mov Cap-2 Maneuver	987	-	-
Stage 1	998	-	-
Stage 2	1022	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1538	-	989	-	-
HCM Lane V/C Ratio	-	-	0.08	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	471	6	0	6
Future Vol, veh/h	0	0	471	6	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	512	7	0	7

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	729
HCM Lane V/C Ratio	-	-	0.009
HCM Control Delay (s)	-	-	10
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	6	823	785	61	57	13
Future Vol, veh/h	6	823	785	61	57	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	895	853	66	62	14

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	920	0	460
Stage 1	-	-	886
Stage 2	-	-	460
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	738	-	548
Stage 1	-	-	363
Stage 2	-	-	602
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	738	-	548
Mov Cap-2 Maneuver	-	-	264
Stage 1	-	-	363
Stage 2	-	-	591

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	20.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	738	-	-	-	264	548
HCM Lane V/C Ratio	0.009	-	-	-	0.235	0.026
HCM Control Delay (s)	9.9	0.1	-	-	22.8	11.7
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.9	0.1

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	13	61	2	49	22	101	65	30	85	0
Future Vol, veh/h	0	2	13	61	2	49	22	101	65	30	85	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	14	66	2	53	24	110	71	33	92	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	352	386	92	359	351	145	92	0	0	180	0	0
Stage 1	158	158	-	193	193	-	-	-	-	-	-	-
Stage 2	194	228	-	166	158	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	526	472	948	621	596	910	1503	-	-	1396	-	-
Stage 1	794	721	-	826	757	-	-	-	-	-	-	-
Stage 2	749	655	-	852	781	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	478	452	948	590	571	910	1503	-	-	1396	-	-
Mov Cap-2 Maneuver	478	452	-	590	571	-	-	-	-	-	-	-
Stage 1	780	703	-	811	743	-	-	-	-	-	-	-
Stage 2	690	643	-	816	761	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	10.7	0.9	2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	827	589	910	1396	-	-
HCM Lane V/C Ratio	0.016	-	-	0.02	0.116	0.059	0.023	-	-
HCM Control Delay (s)	7.4	0	-	9.4	11.9	9.2	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.2	0.1	-	-

Timings

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016

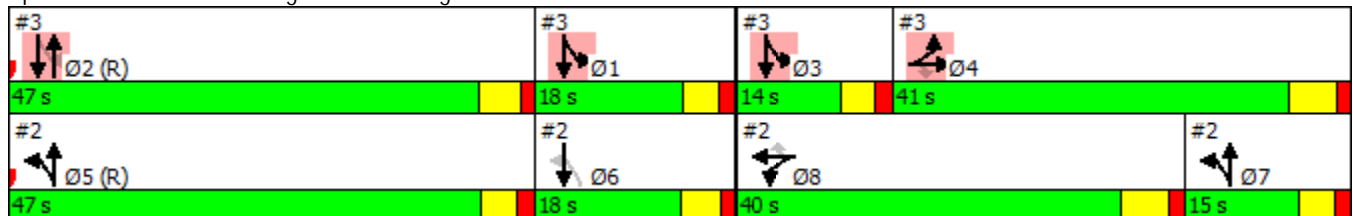


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7
Lane Configurations	↖	↑	↗	↖	↑	↗						
Traffic Volume (vph)	87	435	42	904	149	83						
Future Volume (vph)	87	435	42	904	149	83						
Turn Type	Split	NA	Perm	D,P+P	NA	NA						
Protected Phases	8	8		5 7	5 7	6	1	2	3	4	5	7
Permitted Phases				8	6							
Detector Phase	8	8	8	5 7	5 7	6						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.7			12.0	11.8	12.1	11.8	12.7	11.8	11.8
Total Split (s)	40.0	40.0	40.0			18.0	18.0	47.0	14.0	41.0	47.0	15.0
Total Split (%)	33.3%	33.3%	33.3%			15.0%	15%	39%	12%	34%	39%	13%
Yellow Time (s)	4.3	4.3	4.3			3.6	3.2	3.9	3.2	4.3	3.2	3.2
All-Red Time (s)	1.4	1.4	1.4			1.4	1.6	1.2	1.6	1.4	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0			0.0						
Total Lost Time (s)	5.7	5.7	5.7			5.0						
Lead/Lag	Lead	Lead	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None			Max	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	31.5	31.5	31.5	73.2	60.0	13.0						
Actuated g/C Ratio	0.26	0.26	0.26	0.61	0.50	0.11						
v/c Ratio	0.26	0.95	0.13	0.95	0.17	0.51						
Control Delay	35.7	72.7	0.9	25.6	10.6	30.2						
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0						
Total Delay	35.7	72.7	0.9	25.6	10.6	30.2						
LOS	D	E	A	C	B	C						
Approach Delay		58.6			23.4	30.2						
Approach LOS		E			C	C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 35.5
 Intersection LOS: D
 Intersection Capacity Utilization 91.7%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Village/Horizon/Village & IH 30 WBFR



Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	119	458	64	962	164	222
v/c Ratio	0.26	0.95	0.13	0.95	0.17	0.51
Control Delay	35.7	72.7	0.9	25.6	10.6	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	72.7	0.9	25.6	10.6	30.2
Queue Length 50th (ft)	71	338	0	280	51	44
Queue Length 95th (ft)	96	#520	0	m#770	m62	57
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	500	527	530	1011	953	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.87	0.12	0.95	0.17	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

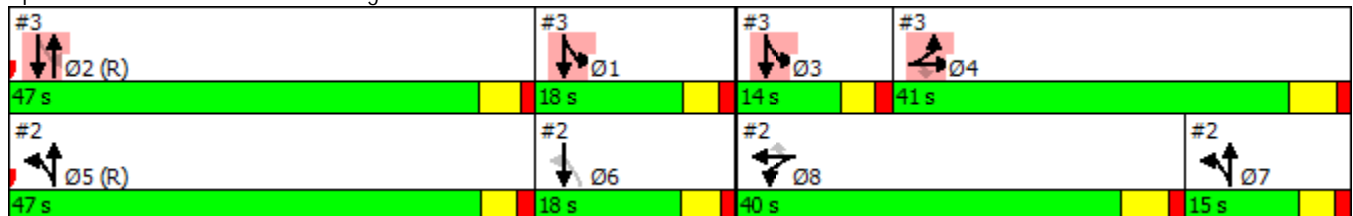


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↔	↗	↕↕	↗	↖	↕						
Traffic Volume (vph)	140	673	695	41	70	130						
Future Volume (vph)	140	673	695	41	70	130						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	41.0	41.0	47.0	47.0			18.0	14.0	47.0	18.0	15.0	40.0
Total Split (%)	34.2%	34.2%	39.2%	39.2%			15%	12%	39%	15%	13%	33%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	None
Act Effct Green (s)	37.5	37.5	41.9	41.9	67.2	72.0						
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.56	0.60						
v/c Ratio	0.47	0.88	0.97	0.07	0.23	0.15						
Control Delay	35.1	16.7	66.2	0.2	37.4	23.3						
Queue Delay	0.0	0.0	4.3	0.0	0.0	0.0						
Total Delay	35.1	16.7	70.4	0.2	37.4	23.3						
LOS	D	B	E	A	D	C						
Approach Delay	23.2		66.4			28.4						
Approach LOS	C		E			C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 37.9
 Intersection LOS: D
 Intersection Capacity Utilization 91.7%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	479	874	739	45	97	171
v/c Ratio	0.47	0.88	0.97	0.07	0.23	0.15
Control Delay	35.1	16.7	66.2	0.2	37.4	23.3
Queue Delay	0.0	0.0	4.3	0.0	0.0	0.0
Total Delay	35.1	16.7	70.4	0.2	37.4	23.3
Queue Length 50th (ft)	157	61	483	0	46	83
Queue Length 95th (ft)	175	66	#704	0	61	102
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	1019	997	758	662	458	1140
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	16	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.88	1.00	0.07	0.21	0.15

Intersection Summary

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

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	55	3	1	7	0	89
Future Vol, veh/h	55	3	1	7	0	89
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	3	1	8	0	97

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	58	48	97
Stage 1	48	-	-
Stage 2	10	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	961	1026	1496
Stage 1	985	-	-
Stage 2	1015	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	960	1026	1496
Mov Cap-2 Maneuver	960	-	-
Stage 1	985	-	-
Stage 2	1014	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1496	-	963	-	-
HCM Lane V/C Ratio	0.001	-	0.065	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	556	50	0	15
Future Vol, veh/h	0	0	556	50	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	604	54	0	16

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10.4
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	678
HCM Lane V/C Ratio	-	-	0.024
HCM Control Delay (s)	-	-	10.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	12	1161	1138	81	42	17
Future Vol, veh/h	12	1161	1138	81	42	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	1262	1237	88	46	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1325	0	663
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	517	-	404
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	517	-	404
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	30.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	517	-	-	-	156	404
HCM Lane V/C Ratio	0.025	-	-	-	0.293	0.046
HCM Control Delay (s)	12.1	0.5	-	-	37.4	14.3
HCM Lane LOS	B	A	-	-	E	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1	0.1

Intersection

Int Delay, s/veh 5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	107	0	12	48	32	88	48	100	0
Future Vol, veh/h	0	0	0	107	0	12	48	32	88	48	100	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	116	0	13	52	35	96	52	109	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	400	448	109	400	400	83	109	0	0	130	0	0
Stage 1	213	213	-	187	187	-	-	-	-	-	-	-
Stage 2	187	235	-	213	213	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	480	425	925	586	563	981	1481	-	-	1455	-	-
Stage 1	726	668	-	832	761	-	-	-	-	-	-	-
Stage 2	758	648	-	808	744	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	447	393	925	553	521	981	1481	-	-	1455	-	-
Mov Cap-2 Maneuver	447	393	-	553	521	-	-	-	-	-	-	-
Stage 1	698	643	-	800	732	-	-	-	-	-	-	-
Stage 2	720	623	-	777	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.7	2.1	2.5
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	-	553	981	1455	-	-
HCM Lane V/C Ratio	0.035	-	-	-	0.21	0.013	0.036	-	-
HCM Control Delay (s)	7.5	0	-	0	13.2	8.7	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	0	0.1	-	-

Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	95	469	20	1246	206	318
v/c Ratio	0.27	1.26	0.05	1.17	0.20	1.08dr
Control Delay	39.4	173.5	0.2	92.4	6.8	57.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	173.5	0.2	92.4	6.8	57.9
Queue Length 50th (ft)	57	-416	0	-977	31	95
Queue Length 95th (ft)	67	#588	0	m#278	m23	92
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	355	373	418	1063	1044	383
Starvation Cap Reductn	0	0	0	6	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.26	0.05	1.18	0.20	0.83

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	412	837	1152	27	77	126
v/c Ratio	0.95dl	0.86	1.26	0.03	0.17	0.10
Control Delay	44.7	13.2	156.0	0.1	26.6	15.2
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	44.7	13.2	156.3	0.1	26.6	15.2
Queue Length 50th (ft)	140	0	~914	0	31	51
Queue Length 95th (ft)	137	36	#1063	0	m40	m74
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	661	973	913	794	485	1327
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	51	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.86	1.34	0.03	0.16	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	79	2	0	2	0	65
Future Vol, veh/h	79	2	0	2	0	65
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	2	0	2	0	71

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	37	35	71
Stage 1	35	-	-
Stage 2	2	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	983	1042	1529
Stage 1	995	-	-
Stage 2	1022	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	983	1042	1529
Mov Cap-2 Maneuver	983	-	-
Stage 1	995	-	-
Stage 2	1022	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1529	-	984	-	-
HCM Lane V/C Ratio	-	-	0.089	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	520	7	0	7
Future Vol, veh/h	0	0	520	7	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	565	8	0	8

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10.2
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	698
HCM Lane V/C Ratio	-	-	0.011
HCM Control Delay (s)	-	-	10.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	7	909	867	68	69	15
Future Vol, veh/h	7	909	867	68	69	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	988	942	74	75	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1016	0	508
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	678	-	510
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	678	-	510
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	24.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	678	-	-	-	233	510
HCM Lane V/C Ratio	0.011	-	-	-	0.322	0.032
HCM Control Delay (s)	10.4	0.1	-	-	27.6	12.3
HCM Lane LOS	B	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	1.3	0.1

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	15	68	2	49	25	111	72	30	85	0
Future Vol, veh/h	0	2	15	68	2	49	25	111	72	30	85	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	16	74	2	53	27	121	78	33	92	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	373	411	92	381	372	160	92	0	0	199	0	0
Stage 1	158	158	-	214	214	-	-	-	-	-	-	-
Stage 2	215	253	-	167	158	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	505	452	948	602	582	893	1503	-	-	1373	-	-
Stage 1	794	721	-	807	743	-	-	-	-	-	-	-
Stage 2	724	632	-	851	781	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	457	432	948	569	556	893	1503	-	-	1373	-	-
Mov Cap-2 Maneuver	457	432	-	569	556	-	-	-	-	-	-	-
Stage 1	778	703	-	791	728	-	-	-	-	-	-	-
Stage 2	665	619	-	813	761	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	11.1	0.9	2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	831	569	893	1373	-	-
HCM Lane V/C Ratio	0.018	-	-	0.022	0.134	0.06	0.024	-	-
HCM Control Delay (s)	7.4	0	-	9.4	12.3	9.3	7.7	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.5	0.2	0.1	-	-

Timings

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016

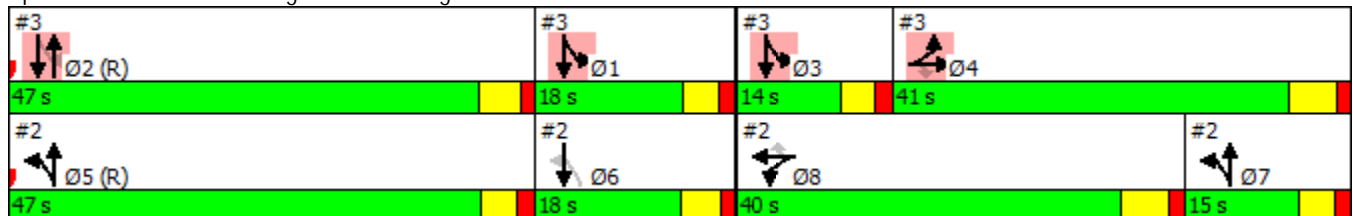


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7
Lane Configurations	↖	↑	↗	↖	↑	↗						
Traffic Volume (vph)	96	480	42	998	164	91						
Future Volume (vph)	96	480	42	998	164	91						
Turn Type	Split	NA	Perm	D,P+P	NA	NA						
Protected Phases	8	8		5 7	5 7	6	1	2	3	4	5	7
Permitted Phases				8	6							
Detector Phase	8	8	8	5 7	5 7	6						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.7			12.0	11.8	12.1	11.8	12.7	11.8	11.8
Total Split (s)	40.0	40.0	40.0			18.0	18.0	47.0	14.0	41.0	47.0	15.0
Total Split (%)	33.3%	33.3%	33.3%			15.0%	15%	39%	12%	34%	39%	13%
Yellow Time (s)	4.3	4.3	4.3			3.6	3.2	3.9	3.2	4.3	3.2	3.2
All-Red Time (s)	1.4	1.4	1.4			1.4	1.6	1.2	1.6	1.4	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0			0.0						
Total Lost Time (s)	5.7	5.7	5.7			5.0						
Lead/Lag	Lead	Lead	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None			Max	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	33.5	33.5	33.5	71.2	58.0	13.0						
Actuated g/C Ratio	0.28	0.28	0.28	0.59	0.48	0.11						
v/c Ratio	0.27	0.98	0.12	1.09	0.20	0.58						
Control Delay	35.2	78.3	0.9	65.7	11.5	38.6						
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0						
Total Delay	35.2	78.3	0.9	65.7	11.5	38.6						
LOS	D	E	A	E	B	D						
Approach Delay		63.1			57.8	38.6						
Approach LOS		E			E	D						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 57.4
 Intersection LOS: E
 Intersection Capacity Utilization 99.3%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Village/Horizon/Village & IH 30 WBFR



Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	132	505	64	1062	180	243
v/c Ratio	0.27	0.98	0.12	1.09	0.20	0.58
Control Delay	35.2	78.3	0.9	65.7	11.5	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	78.3	0.9	65.7	11.5	38.6
Queue Length 50th (ft)	79	385	0	~834	58	61
Queue Length 95th (ft)	106	#600	0	m#840	m60	74
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	500	527	530	971	921	419
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.96	0.12	1.09	0.20	0.58

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

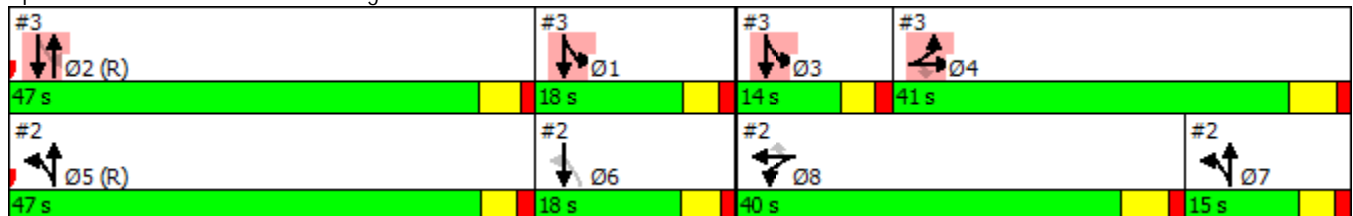


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↔	↗	↕↕	↗	↖	↕						
Traffic Volume (vph)	158	758	768	45	70	130						
Future Volume (vph)	158	758	768	45	70	130						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	41.0	41.0	47.0	47.0			18.0	14.0	47.0	18.0	15.0	40.0
Total Split (%)	34.2%	34.2%	39.2%	39.2%			15%	12%	39%	15%	13%	33%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	None
Act Effect Green (s)	37.5	37.5	41.9	41.9	67.2	72.0						
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.56	0.60						
v/c Ratio	0.53	0.99	1.08	0.07	0.23	0.15						
Control Delay	36.3	35.5	93.5	0.2	36.6	23.6						
Queue Delay	0.0	0.0	9.1	0.0	0.0	0.0						
Total Delay	36.3	35.5	102.6	0.2	36.6	23.6						
LOS	D	D	F	A	D	C						
Approach Delay	35.8		96.8			28.3						
Approach LOS	D		F			C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 54.9
 Intersection LOS: D
 Intersection Capacity Utilization 99.3%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	541	984	817	49	97	171
v/c Ratio	0.53	0.99	1.08	0.07	0.23	0.15
Control Delay	36.3	35.5	93.5	0.2	36.6	23.6
Queue Delay	0.0	0.0	9.1	0.0	0.0	0.0
Total Delay	36.3	35.5	102.6	0.2	36.6	23.6
Queue Length 50th (ft)	181	242	~608	0	47	83
Queue Length 95th (ft)	200	227	#818	0	62	101
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	1019	997	758	662	458	1140
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	41	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.99	1.14	0.07	0.21	0.15

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	61	3	1	8	0	98
Future Vol, veh/h	61	3	1	8	0	98
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	3	1	9	0	107

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	64	53	107
Stage 1	53	-	-
Stage 2	11	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	955	1020	1484
Stage 1	981	-	-
Stage 2	1014	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	954	1020	1484
Mov Cap-2 Maneuver	954	-	-
Stage 1	981	-	-
Stage 2	1013	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1484	-	957	-	-
HCM Lane V/C Ratio	0.001	-	0.073	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	614	55	0	17
Future Vol, veh/h	0	0	614	55	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	667	60	0	18

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10.7
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	645
HCM Lane V/C Ratio	-	-	0.029
HCM Control Delay (s)	-	-	10.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	14	1282	1257	89	46	19
Future Vol, veh/h	14	1282	1257	89	46	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	1393	1366	97	50	21

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1463	0	732
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	458	-	364
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	458	-	364
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	39.2
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	458	-	-	-	130	364
HCM Lane V/C Ratio	0.033	-	-	-	0.385	0.057
HCM Control Delay (s)	13.1	0.9	-	-	49	15.5
HCM Lane LOS	B	A	-	-	E	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.6	0.2

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	135	0	12	44	29	98	48	100	0
Future Vol, veh/h	0	0	0	135	0	12	44	29	98	48	100	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	147	0	13	48	32	107	52	109	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	393	447	109	393	393	85	109	0	0	138	0	0
Stage 1	213	213	-	180	180	-	-	-	-	-	-	-
Stage 2	180	234	-	213	213	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	486	426	925	592	567	979	1481	-	-	1446	-	-
Stage 1	726	668	-	838	766	-	-	-	-	-	-	-
Stage 2	766	649	-	808	744	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	453	395	925	559	526	979	1481	-	-	1446	-	-
Mov Cap-2 Maneuver	453	395	-	559	526	-	-	-	-	-	-	-
Stage 1	700	643	-	808	738	-	-	-	-	-	-	-
Stage 2	729	626	-	777	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.3	1.9	2.5
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	-	559	979	1446	-	-
HCM Lane V/C Ratio	0.032	-	-	-	0.263	0.013	0.036	-	-
HCM Control Delay (s)	7.5	0	-	0	13.7	8.7	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	1	0	0.1	-	-

Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	86	462	20	1129	213	334
v/c Ratio	0.24	1.24	0.05	1.06	0.20	1.08dr
Control Delay	39.0	166.4	0.2	41.3	6.6	56.6
Queue Delay	0.0	0.0	0.0	4.0	0.0	0.0
Total Delay	39.0	166.4	0.2	45.3	6.6	56.6
Queue Length 50th (ft)	51	-405	0	-805	33	95
Queue Length 95th (ft)	61	#576	0	m248	m27	91
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	355	373	418	1063	1044	397
Starvation Cap Reductn	0	0	0	10	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	1.24	0.05	1.07	0.20	0.84

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

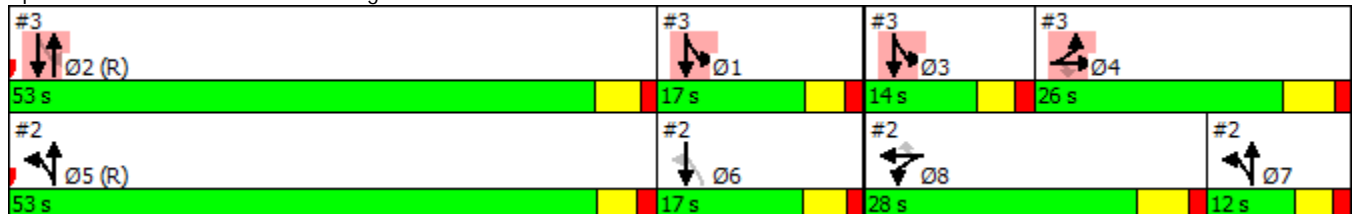


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↑	↗	↕	↗	↖	↖						
Traffic Volume (vph)	52	614	899	17	45	103						
Future Volume (vph)	52	614	899	17	45	103						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	26.0	26.0	53.0	53.0			17.0	14.0	53.0	17.0	12.0	28.0
Total Split (%)	23.6%	23.6%	48.2%	48.2%			15%	13%	48%	15%	11%	25%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	Max
Act Effct Green (s)	22.5	22.5	47.9	47.9	72.2	77.0						
Actuated g/C Ratio	0.20	0.20	0.44	0.44	0.66	0.70						
v/c Ratio	0.92dl	0.83	1.14	0.03	0.15	0.09						
Control Delay	44.0	12.2	108.5	0.1	25.0	14.9						
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0						
Total Delay	44.0	12.2	108.7	0.1	25.0	14.9						
LOS	D	B	F	A	C	B						
Approach Delay	23.1		106.3			18.6						
Approach LOS	C		F			B						

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 59.6
 Intersection LOS: E
 Intersection Capacity Utilization 96.7%
 ICU Level of Service F
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	395	758	1045	24	69	120
v/c Ratio	0.92dl	0.83	1.14	0.03	0.15	0.09
Control Delay	44.0	12.2	108.5	0.1	25.0	14.9
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	44.0	12.2	108.7	0.1	25.0	14.9
Queue Length 50th (ft)	134	0	~774	0	27	48
Queue Length 95th (ft)	132	39	#925	0	m36	m68
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	660	910	913	794	485	1327
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	29	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.83	1.18	0.03	0.14	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	90	2	0	2	33	98
Future Vol, veh/h	90	2	0	2	33	98
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	2	0	2	36	107

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	91	89	142
Stage 1	89	-	-
Stage 2	2	-	-
Critical Hdwy	5.62	5.82	4.12
Critical Hdwy Stg 1	4.62	-	-
Critical Hdwy Stg 2	4.62	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	928	979	1441
Stage 1	953	-	-
Stage 2	1022	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	928	979	1441
Mov Cap-2 Maneuver	928	-	-
Stage 1	953	-	-
Stage 2	1022	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1441	-	929	-	-
HCM Lane V/C Ratio	-	-	0.108	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	471	6	0	39
Future Vol, veh/h	0	0	471	6	0	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	512	7	0	42

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10.2
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	729
HCM Lane V/C Ratio	-	-	0.058
HCM Control Delay (s)	-	-	10.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

Intersection

Int Delay, s/veh 3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	66	6	79	13	1	65
Future Vol, veh/h	66	6	79	13	1	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	7	86	14	1	71

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	166	93	0
Stage 1	93	-	-
Stage 2	73	-	-
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	824	964	1493
Stage 1	931	-	-
Stage 2	950	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	823	964	1493
Mov Cap-2 Maneuver	823	-	-
Stage 1	931	-	-
Stage 2	949	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	833	1493
HCM Lane V/C Ratio	-	-	0.094	0.001
HCM Control Delay (s)	-	-	9.8	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	6	33	8	61	79	6
Future Vol, veh/h	6	33	8	61	79	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	36	9	66	86	7

Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	173	89	92	0
Stage 1	89	-	-	-
Stage 2	84	-	-	-
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	817	969	1503	-
Stage 1	934	-	-	-
Stage 2	939	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	812	969	1503	-
Mov Cap-2 Maneuver	812	-	-	-
Stage 1	934	-	-	-
Stage 2	933	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	941	-	-
HCM Lane V/C Ratio	0.006	-	0.045	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	823	785	64	68	41
Future Vol, veh/h	13	823	785	64	68	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	895	853	70	74	45

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	923	0	461
Stage 1	-	-	888
Stage 2	-	-	476
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	736	-	547
Stage 1	-	-	362
Stage 2	-	-	591
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	736	-	547
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	362
Stage 2	-	-	569

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	736	-	-	-	259	547
HCM Lane V/C Ratio	0.019	-	-	-	0.285	0.081
HCM Control Delay (s)	10	0.2	-	-	24.4	12.2
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1	0.3

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	13	82	2	49	22	101	136	30	85	0
Future Vol, veh/h	0	2	13	82	2	49	22	101	136	30	85	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	14	89	2	53	24	110	148	33	92	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	391	463	92	398	390	184	92	0	0	258	0	0
Stage 1	158	158	-	232	232	-	-	-	-	-	-	-
Stage 2	233	305	-	166	158	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	488	414	948	588	569	867	1503	-	-	1307	-	-
Stage 1	794	721	-	791	731	-	-	-	-	-	-	-
Stage 2	703	588	-	852	781	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	441	395	948	557	543	867	1503	-	-	1307	-	-
Mov Cap-2 Maneuver	441	395	-	557	543	-	-	-	-	-	-	-
Stage 1	779	702	-	776	717	-	-	-	-	-	-	-
Stage 2	645	577	-	814	760	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	11.5	0.6	2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	799	557	867	1307	-	-
HCM Lane V/C Ratio	0.016	-	-	0.02	0.164	0.061	0.025	-	-
HCM Control Delay (s)	7.4	0	-	9.6	12.7	9.4	7.8	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.2	0.1	-	-

Timings

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016

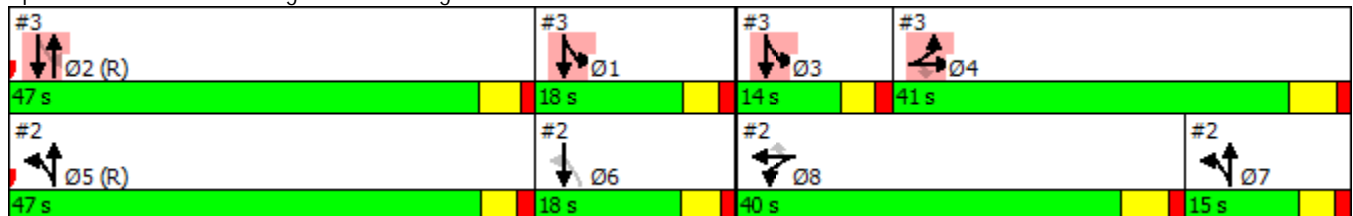


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7
Lane Configurations	↖	↑	↗	↖	↑	↗						
Traffic Volume (vph)	87	452	42	904	220	86						
Future Volume (vph)	87	452	42	904	220	86						
Turn Type	Split	NA	Perm	D,P+P	NA	NA						
Protected Phases	8	8		5 7	5 7	6	1	2	3	4	5	7
Permitted Phases				8	6							
Detector Phase	8	8	8	5 7	5 7	6						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.7			12.0	11.8	12.1	11.8	12.7	11.8	11.8
Total Split (s)	40.0	40.0	40.0			18.0	18.0	47.0	14.0	41.0	47.0	15.0
Total Split (%)	33.3%	33.3%	33.3%			15.0%	15%	39%	12%	34%	39%	13%
Yellow Time (s)	4.3	4.3	4.3			3.6	3.2	3.9	3.2	4.3	3.2	3.2
All-Red Time (s)	1.4	1.4	1.4			1.4	1.6	1.2	1.6	1.4	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0			0.0						
Total Lost Time (s)	5.7	5.7	5.7			5.0						
Lead/Lag	Lead	Lead	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None			Max	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	32.3	32.3	32.3	72.4	59.2	13.0						
Actuated g/C Ratio	0.27	0.27	0.27	0.60	0.49	0.11						
v/c Ratio	0.25	0.96	0.13	0.97	0.26	0.57						
Control Delay	35.3	74.6	0.9	28.2	10.9	34.4						
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0						
Total Delay	35.3	74.6	0.9	29.4	10.9	34.4						
LOS	D	E	A	C	B	C						
Approach Delay		60.4			25.7	34.4						
Approach LOS		E			C	C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 37.5
 Intersection LOS: D
 Intersection Capacity Utilization 92.6%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Village/Horizon/Village & IH 30 WBFR



Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	119	476	64	962	242	248
v/c Ratio	0.25	0.96	0.13	0.97	0.26	0.57
Control Delay	35.3	74.6	0.9	28.2	10.9	34.4
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0
Total Delay	35.3	74.6	0.9	29.4	10.9	34.4
Queue Length 50th (ft)	71	355	0	~303	84	54
Queue Length 95th (ft)	96	#552	0	m#791	m94	68
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	500	527	530	987	941	435
Starvation Cap Reductn	0	0	0	7	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.90	0.12	0.98	0.26	0.57

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

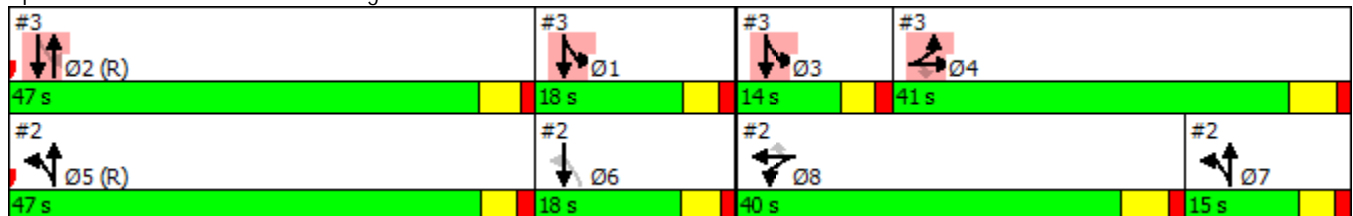


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↔	↗	↕↕	↗	↖	↕						
Traffic Volume (vph)	143	686	701	41	70	132						
Future Volume (vph)	143	686	701	41	70	132						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	41.0	41.0	47.0	47.0			18.0	14.0	47.0	18.0	15.0	40.0
Total Split (%)	34.2%	34.2%	39.2%	39.2%			15%	12%	39%	15%	13%	33%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	None
Act Effect Green (s)	37.5	37.5	41.9	41.9	67.2	72.0						
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.56	0.60						
v/c Ratio	0.57	0.90	0.98	0.07	0.23	0.16						
Control Delay	37.1	19.1	68.3	0.2	36.1	22.6						
Queue Delay	0.0	0.0	9.9	0.0	0.0	0.0						
Total Delay	37.1	19.1	78.1	0.2	36.1	22.6						
LOS	D	B	E	A	D	C						
Approach Delay	26.2		73.7			27.5						
Approach LOS	C		E			C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 41.2
 Intersection LOS: D
 Intersection Capacity Utilization 92.6%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	574	891	746	45	97	174
v/c Ratio	0.57	0.90	0.98	0.07	0.23	0.16
Control Delay	37.1	19.1	68.3	0.2	36.1	22.6
Queue Delay	0.0	0.0	9.9	0.0	0.0	0.0
Total Delay	37.1	19.1	78.1	0.2	36.1	22.6
Queue Length 50th (ft)	194	90	490	0	45	82
Queue Length 95th (ft)	212	93	#713	0	60	101
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	1015	994	758	662	458	1140
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	29	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.90	1.02	0.07	0.21	0.15

Intersection Summary

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

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	126	3	1	7	18	109
Future Vol, veh/h	126	3	1	7	18	109
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	3	1	8	20	118

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	89	79	138 0
Stage 1	79	-	- -
Stage 2	10	-	- -
Critical Hdwy	5.62	5.82	4.12 -
Critical Hdwy Stg 1	4.62	-	- -
Critical Hdwy Stg 2	4.62	-	- -
Follow-up Hdwy	3.518	3.318	2.218 -
Pot Cap-1 Maneuver	930	990	1446 -
Stage 1	961	-	- -
Stage 2	1015	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	929	990	1446 -
Mov Cap-2 Maneuver	929	-	- -
Stage 1	961	-	- -
Stage 2	1014	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1446	-	930	-	-
HCM Lane V/C Ratio	0.001	-	0.151	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	556	50	0	33
Future Vol, veh/h	0	0	556	50	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	604	54	0	36

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	10.6
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	678
HCM Lane V/C Ratio	-	-	0.053
HCM Control Delay (s)	-	-	10.6
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

Intersection

Int Delay, s/veh 1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	35	3	84	49	5	92
Future Vol, veh/h	35	3	84	49	5	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	3	91	53	5	100

Major/Minor	Minor1	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	229	118	0	0	145	0
Stage 1	118	-	-	-	-	-
Stage 2	111	-	-	-	-	-
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	759	934	-	-	1437	-
Stage 1	907	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	756	934	-	-	1437	-
Mov Cap-2 Maneuver	756	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	768	1437	-
HCM Lane V/C Ratio	-	-	0.054	0.004	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	18	33	94	65	22
Future Vol, veh/h	3	18	33	94	65	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	20	36	102	71	24

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	257	83	95 0
Stage 1	83	-	-
Stage 2	174	-	-
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	732	976	1499 -
Stage 1	940	-	-
Stage 2	856	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	714	976	1499 -
Mov Cap-2 Maneuver	714	-	-
Stage 1	940	-	-
Stage 2	835	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	1.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1499	-	927	-	-
HCM Lane V/C Ratio	0.024	-	0.025	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	39	1161	1138	91	48	32
Future Vol, veh/h	39	1161	1138	91	48	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	1262	1237	99	52	35

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1336	0	668
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	512	-	401
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	512	-	401
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	33.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	512	-	-	-	137	401
HCM Lane V/C Ratio	0.083	-	-	-	0.381	0.087
HCM Control Delay (s)	12.7	1.6	-	-	46.6	14.8
HCM Lane LOS	B	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.6	0.3

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	145	0	12	48	32	106	48	100	0
Future Vol, veh/h	0	0	0	145	0	12	48	32	106	48	100	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	158	0	13	52	35	115	52	109	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	410	467	109	410	410	92	109	0	0	150	0	0
Stage 1	213	213	-	197	197	-	-	-	-	-	-	-
Stage 2	197	254	-	213	213	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	471	412	925	578	556	970	1481	-	-	1431	-	-
Stage 1	726	668	-	823	754	-	-	-	-	-	-	-
Stage 2	745	631	-	808	744	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	437	380	925	544	513	970	1481	-	-	1431	-	-
Mov Cap-2 Maneuver	437	380	-	544	513	-	-	-	-	-	-	-
Stage 1	698	642	-	791	725	-	-	-	-	-	-	-
Stage 2	706	606	-	776	715	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.9	1.9	2.5
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	-	544	970	1431	-	-
HCM Lane V/C Ratio	0.035	-	-	-	0.29	0.013	0.036	-	-
HCM Control Delay (s)	7.5	0	-	0	14.3	8.8	7.6	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2	0	0.1	-	-

Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	95	507	20	1246	232	365
v/c Ratio	0.27	1.36	0.05	1.17	0.22	1.27dr
Control Delay	39.4	213.7	0.2	92.0	6.8	79.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	213.7	0.2	92.0	6.8	79.1
Queue Length 50th (ft)	57	-472	0	-978	35	116
Queue Length 95th (ft)	67	#647	0	m#259	m26	109
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	355	373	418	1063	1044	380
Starvation Cap Reductn	0	0	0	9	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.36	0.05	1.18	0.22	0.96

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

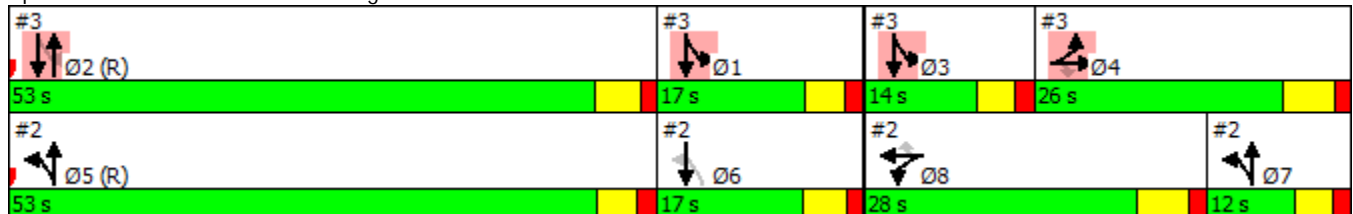


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↑	↗	↕	↗	↖	↑						
Traffic Volume (vph)	57	678	992	19	50	114						
Future Volume (vph)	57	678	992	19	50	114						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		13	12 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	13	12 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	26.0	26.0	53.0	53.0			17.0	14.0	53.0	17.0	12.0	28.0
Total Split (%)	23.6%	23.6%	48.2%	48.2%			15%	13%	48%	15%	11%	25%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	Max
Act Effct Green (s)	22.5	22.5	47.9	47.9	72.2	77.0						
Actuated g/C Ratio	0.20	0.20	0.44	0.44	0.66	0.70						
v/c Ratio	1.01dl	0.86	1.26	0.03	0.17	0.10						
Control Delay	45.6	13.2	156.5	0.1	25.2	14.7						
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0						
Total Delay	45.6	13.2	156.8	0.1	25.2	14.7						
LOS	D	B	F	A	C	B						
Approach Delay	24.2		153.2			18.6						
Approach LOS	C		F			B						

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.36
 Intersection Signal Delay: 81.0
 Intersection LOS: F
 Intersection Capacity Utilization 106.1%
 ICU Level of Service G
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	432	837	1153	27	77	133
v/c Ratio	1.01dl	0.86	1.26	0.03	0.17	0.10
Control Delay	45.6	13.2	156.5	0.1	25.2	14.7
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	45.6	13.2	156.8	0.1	25.2	14.7
Queue Length 50th (ft)	148	0	~916	0	30	52
Queue Length 95th (ft)	144	36	#1066	0	m37	m71
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	660	973	913	794	485	1327
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	56	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.86	1.35	0.03	0.16	0.10

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	97	2	0	2	33	104
Future Vol, veh/h	97	2	0	2	33	104
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	2	0	2	36	113

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	94	92	149 0
Stage 1	92	-	- -
Stage 2	2	-	- -
Critical Hdwy	5.62	5.82	4.12 -
Critical Hdwy Stg 1	4.62	-	- -
Critical Hdwy Stg 2	4.62	-	- -
Follow-up Hdwy	3.518	3.318	2.218 -
Pot Cap-1 Maneuver	925	975	1432 -
Stage 1	951	-	- -
Stage 2	1022	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	925	975	1432 -
Mov Cap-2 Maneuver	925	-	- -
Stage 1	951	-	- -
Stage 2	1022	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1432	-	926	-	-
HCM Lane V/C Ratio	-	-	0.116	-	-
HCM Control Delay (s)	0	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	520	7	0	40
Future Vol, veh/h	0	0	520	7	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	565	8	0	43

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

HCM Control Delay, s 0 10.5
HCM LOS B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	698
HCM Lane V/C Ratio	-	-	0.062
HCM Control Delay (s)	-	-	10.5
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

Intersection

Int Delay, s/veh 3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	66	6	87	13	1	71
Future Vol, veh/h	66	6	87	13	1	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	7	95	14	1	77

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	181	102	0
Stage 1	102	-	-
Stage 2	79	-	-
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	808	953	1481
Stage 1	922	-	-
Stage 2	944	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	807	953	1481
Mov Cap-2 Maneuver	807	-	-
Stage 1	922	-	-
Stage 2	943	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	817	1481
HCM Lane V/C Ratio	-	-	0.096	0.001
HCM Control Delay (s)	-	-	9.9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection

Int Delay, s/veh 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	6	33	8	67	87	6
Future Vol, veh/h	6	33	8	67	87	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	36	9	73	95	7

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	188	98	101 0
Stage 1	98	-	- -
Stage 2	90	-	- -
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	801	958	1491 -
Stage 1	926	-	- -
Stage 2	934	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	796	958	1491 -
Mov Cap-2 Maneuver	796	-	- -
Stage 1	926	-	- -
Stage 2	928	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1491	-	929	-	-
HCM Lane V/C Ratio	0.006	-	0.046	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	14	909	867	70	74	42
Future Vol, veh/h	14	909	867	70	74	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	988	942	76	80	46

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1018	0	509
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	677	-	509
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	677	-	509
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	23.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	677	-	-	-	229	509
HCM Lane V/C Ratio	0.022	-	-	-	0.351	0.09
HCM Control Delay (s)	10.4	0.2	-	-	29	12.8
HCM Lane LOS	B	A	-	-	D	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.5	0.3

HCM 2010 TWSC
1: Village & Laguna Drive

3/24/2016

Intersection

Int Delay, s/veh 4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	15	88	2	49	25	111	143	30	85	0
Future Vol, veh/h	0	2	15	88	2	49	25	111	143	30	85	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-2	-	-	-5	-	-	10	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	16	96	2	53	27	121	155	33	92	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	412	488	92	420	411	198	92	0	0	276	0	0
Stage 1	158	158	-	253	253	-	-	-	-	-	-	-
Stage 2	254	330	-	167	158	-	-	-	-	-	-	-
Critical Hdwy	8.52	7.92	6.92	6.72	6.12	6.02	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.52	6.92	-	5.72	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	469	397	948	570	555	852	1503	-	-	1287	-	-
Stage 1	794	721	-	773	718	-	-	-	-	-	-	-
Stage 2	680	568	-	851	781	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	422	378	948	537	528	852	1503	-	-	1287	-	-
Mov Cap-2 Maneuver	422	378	-	537	528	-	-	-	-	-	-	-
Stage 1	777	702	-	756	702	-	-	-	-	-	-	-
Stage 2	622	556	-	811	760	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	11.9	0.7	2.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	805	537	852	1287	-	-
HCM Lane V/C Ratio	0.018	-	-	0.023	0.182	0.063	0.025	-	-
HCM Control Delay (s)	7.4	0	-	9.6	13.2	9.5	7.9	0	-
HCM Lane LOS	A	A	-	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.7	0.2	0.1	-	-

Timings

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016

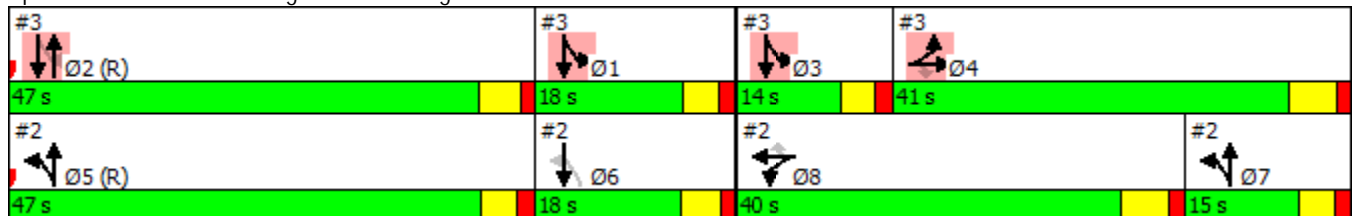


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7
Lane Configurations	↖	↑	↗	↖	↑	↕						
Traffic Volume (vph)	96	497	42	998	235	94						
Future Volume (vph)	96	497	42	998	235	94						
Turn Type	Split	NA	Perm	D,P+P	NA	NA						
Protected Phases	8	8		5 7	5 7	6	1	2	3	4	5	7
Permitted Phases				8	6							
Detector Phase	8	8	8	5 7	5 7	6						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.7			12.0	11.8	12.1	11.8	12.7	11.8	11.8
Total Split (s)	40.0	40.0	40.0			18.0	18.0	47.0	14.0	41.0	47.0	15.0
Total Split (%)	33.3%	33.3%	33.3%			15.0%	15%	39%	12%	34%	39%	13%
Yellow Time (s)	4.3	4.3	4.3			3.6	3.2	3.9	3.2	4.3	3.2	3.2
All-Red Time (s)	1.4	1.4	1.4			1.4	1.6	1.2	1.6	1.4	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0			0.0						
Total Lost Time (s)	5.7	5.7	5.7			5.0						
Lead/Lag	Lead	Lead	Lead			Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None			Max	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	34.3	34.3	34.3	70.4	57.2	13.0						
Actuated g/C Ratio	0.29	0.29	0.29	0.59	0.48	0.11						
v/c Ratio	0.26	0.99	0.12	1.12	0.28	0.66						
Control Delay	34.9	80.6	0.9	76.3	11.8	44.1						
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0						
Total Delay	34.9	80.6	0.9	76.3	11.8	44.1						
LOS	C	F	A	E	B	D						
Approach Delay		65.1			63.7	44.1						
Approach LOS		E			E	D						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 61.8
 Intersection LOS: E
 Intersection Capacity Utilization 100.4%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 2: Village/Horizon/Village & IH 30 WBFR



Queues

2: Village/Horizon/Village & IH 30 WBFR

3/24/2016



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	132	523	64	1062	258	272
v/c Ratio	0.26	0.99	0.12	1.12	0.28	0.66
Control Delay	34.9	80.6	0.9	76.3	11.8	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	80.6	0.9	76.3	11.8	44.1
Queue Length 50th (ft)	79	404	0	~858	91	75
Queue Length 95th (ft)	106	#633	0	m#872	m88	88
Internal Link Dist (ft)		604			401	71
Turn Bay Length (ft)			110			
Base Capacity (vph)	500	527	530	947	909	413
Starvation Cap Reductn	0	0	0	3	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.99	0.12	1.13	0.28	0.66

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Timings

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016

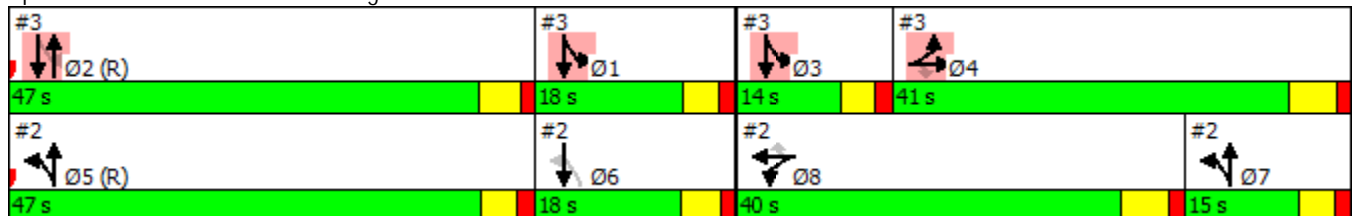


Lane Group	EBT	EBR	NBT	NBR	SBL	SBT	Ø1	Ø3	Ø5	Ø6	Ø7	Ø8
Lane Configurations	↔↕	↗	↕↕	↗	↖	↕						
Traffic Volume (vph)	158	758	773	45	78	146						
Future Volume (vph)	158	758	773	45	78	146						
Turn Type	NA	Perm	NA	Perm	D.P+P	NA						
Protected Phases	4		2		1 3	1 2 3	1	3	5	6	7	8
Permitted Phases		4		2	2							
Detector Phase	4	4	2	2	1 3	1 2 3						
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0			7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	12.7	12.7	12.1	12.1			11.8	11.8	11.8	12.0	11.8	12.7
Total Split (s)	41.0	41.0	47.0	47.0			18.0	14.0	47.0	18.0	15.0	40.0
Total Split (%)	34.2%	34.2%	39.2%	39.2%			15%	12%	39%	15%	13%	33%
Yellow Time (s)	4.3	4.3	3.9	3.9			3.2	3.2	3.2	3.6	3.2	4.3
All-Red Time (s)	1.4	1.4	1.2	1.2			1.6	1.6	1.6	1.4	1.6	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0								
Total Lost Time (s)	5.7	5.7	5.1	5.1								
Lead/Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max			None	None	C-Max	Max	None	None
Act Effct Green (s)	37.5	37.5	41.9	41.9	67.2	72.0						
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.56	0.60						
v/c Ratio	0.62	1.01	1.08	0.07	0.25	0.17						
Control Delay	38.3	42.8	95.6	0.2	35.4	22.0						
Queue Delay	0.2	0.0	6.7	0.0	0.0	0.0						
Total Delay	38.5	42.8	102.3	0.2	35.4	22.0						
LOS	D	D	F	A	D	C						
Approach Delay	41.1		96.6			26.8						
Approach LOS	D		F			C						

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 56.9
 Intersection LOS: E
 Intersection Capacity Utilization 100.4%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 3: Horizon/Village/Horizon & IH 30 EBFR



Queues

3: Horizon/Village/Horizon & IH 30 EBFR

3/24/2016



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	626	984	822	49	108	192
v/c Ratio	0.62	1.01	1.08	0.07	0.25	0.17
Control Delay	38.3	42.8	95.6	0.2	35.4	22.0
Queue Delay	0.2	0.0	6.7	0.0	0.0	0.0
Total Delay	38.5	42.8	102.3	0.2	35.4	22.0
Queue Length 50th (ft)	216	~320	~615	0	48	88
Queue Length 95th (ft)	233	#283	#824	0	63	107
Internal Link Dist (ft)	330		616			401
Turn Bay Length (ft)		150		90		
Base Capacity (vph)	1015	974	758	662	458	1140
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	50	0	57	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.01	1.17	0.07	0.24	0.17

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh 4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	132	3	1	8	18	119
Future Vol, veh/h	132	3	1	8	18	119
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, %	-4	-	-	-6	5	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	3	1	9	20	129

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	95	84	149 0
Stage 1	84	-	- -
Stage 2	11	-	- -
Critical Hdwy	5.62	5.82	4.12 -
Critical Hdwy Stg 1	4.62	-	- -
Critical Hdwy Stg 2	4.62	-	- -
Follow-up Hdwy	3.518	3.318	2.218 -
Pot Cap-1 Maneuver	924	984	1432 -
Stage 1	957	-	- -
Stage 2	1014	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	923	984	1432 -
Mov Cap-2 Maneuver	923	-	- -
Stage 1	957	-	- -
Stage 2	1013	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1432	-	924	-	-
HCM Lane V/C Ratio	0.001	-	0.159	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	0	614	55	0	35
Future Vol, veh/h	0	0	614	55	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	175	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	667	60	0	38

Major/Minor

	Major2	Minor2
Conflicting Flow All	- 0	667 333
Stage 1	- -	667 -
Stage 2	- -	0 -
Critical Hdwy	- -	8.14 7.24
Critical Hdwy Stg 1	- -	7.14 -
Critical Hdwy Stg 2	- -	- -
Follow-up Hdwy	- -	3.52 3.32
Pot Cap-1 Maneuver	- -	308 645
Stage 1	- -	371 -
Stage 2	- -	- -
Platoon blocked, %	- -	- -
Mov Cap-1 Maneuver	- -	308 645
Mov Cap-2 Maneuver	- -	308 -
Stage 1	- -	371 -
Stage 2	- -	- -

Approach

	WB	SB
HCM Control Delay, s	0	10.9
HCM LOS		B

Minor Lane/Major Mvmt

	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	645
HCM Lane V/C Ratio	-	-	0.059
HCM Control Delay (s)	-	-	10.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

Intersection

Int Delay, s/veh 1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	35	3	90	49	5	101
Future Vol, veh/h	35	3	90	49	5	101
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	3	98	53	5	110

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	245	124	0
Stage 1	124	-	-
Stage 2	121	-	-
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	743	927	1430
Stage 1	902	-	-
Stage 2	904	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	740	927	1430
Mov Cap-2 Maneuver	740	-	-
Stage 1	902	-	-
Stage 2	900	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	752	1430
HCM Lane V/C Ratio	-	-	0.055	0.004
HCM Control Delay (s)	-	-	10.1	7.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	18	33	103	72	22
Future Vol, veh/h	3	18	33	103	72	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	20	36	112	78	24

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	274	90	102 0
Stage 1	90	-	- -
Stage 2	184	-	- -
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	716	968	1490 -
Stage 1	934	-	- -
Stage 2	848	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	697	968	1490 -
Mov Cap-2 Maneuver	697	-	- -
Stage 1	934	-	- -
Stage 2	826	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	9	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1490	-	917	-	-
HCM Lane V/C Ratio	0.024	-	0.025	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection

Int Delay, s/veh 3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	41	1282	1257	100	52	34
Future Vol, veh/h	41	1282	1257	100	52	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	1393	1366	109	57	37

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1475	0	738
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	3.32
Pot Cap-1 Maneuver	453	-	360
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	453	-	360
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	51.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	453	-	-	-	104	360
HCM Lane V/C Ratio	0.098	-	-	-	0.543	0.103
HCM Control Delay (s)	13.8	2.9	-	-	74.8	16.1
HCM Lane LOS	B	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	-	-	-	2.5	0.3

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon