Exhibit D-2

J-U-B ENGINEERS, INC.

J-U-B COMPANIES THE LANGDON GROUP GATEWAY MAPPING INC.

MEMORANDUM

DATE: October 16, 2013

TO: Scott Thomson, Evergreen Ventures

CC: Lori Labrum, P.E., P.T.O.E.

FROM: Vijay Kornala, P.E., P.T.O.E.

SUBJECT: Lane Meadows Preliminary Traffic Evaluation

Introduction

J-U-B Engineers was contracted by Evergreen Ventures to prepare a preliminary traffic evaluation for the Lane Meadows subdivision (project). The project site is located adjacent to State Highway 75 (SH 75) just south of Elkhorn Road in Blaine County, Idaho, **Figure 1**. The project will consist of 12 single-family detached homes and will have access to SH 75 via Lane Avenue. The site plan for the project is included in **Appendix 1**. The purpose of this evaluation is to estimate the project trip generation, identify any roadway or intersection deficiencies associated with the proposed project, and conduct a turn lane warrant analysis for the project entrance and recommend warranted turn lanes. This traffic evaluation was conducted in accordance with the requirements of the City of Sun Valley Code sections 9-5A-4-D.1.b and 9-5A-4-D.2.a and the turn lane warrants analysis is consistent with the Idaho Transportation Department (ITD) procedures.

Traffic Evaluation

The project is located adjacent to SH 75, which is a State maintained 5-lane undivided rural minor arterial in the vicinity of the project. Elkhorn Road is 2-lane City roadway. The study area for the project is illustrated in **Figure 2** and includes the following intersections:

- SH 75/Elkhorn Road
- SH 75/Lane Avenue

SH 75/Elkhorn Road is a signalized intersection and the SH 75/Lane Avenue intersection will be operated with a stop condition on Lane Avenue. A two-way left-turn lane currently exists on SH 75 in the vicinity of the project. The posted speed limit for SH 75 is 45 mph and changes to 35 mph just south of the SH 75/Elkhorn Road intersection. The posted speed limit on Elkhorn Road is 35 mph.

The PM peak hour was determined to be the critical hour for analysis purposes. The 2013 PM peak hour intersection turning movement counts at SH 75/Elkhorn Road were counted on Sunday, September 1, 2013 and were obtained from L2 Data Collection with the approval of the City of Sun Valley. Since the turning movement counts were collected on a Sunday, the nearest SH 75 ATR data for the month of September 2012 was also downloaded from the ITD website. The turning movement counts and ATR data summary are included in **Appendix 2**. From the ATR

data, an adjustment factor of 1.43 was calculated from a comparison of a Sunday to average weekday in September. The Sunday PM peak hour turning movement count was adjusted using the 1.43 factor to reflect average weekday PM peak hour conditions. The adjusted existing 2013 traffic volumes for the two intersections and the intersection lane configurations are illustrated in **Figure 3**.

The project will consist of 12 single family detached homes. Trip generation for the proposed project was estimated using data published in *Trip Generation, 8th Edition*, Institute of Transportation Engineers (ITE), 2009. Land Use Code 210 Single-Family Dwelling Unit was used to estimate the trip generation for the project based on the equations to be conservative. The project is expected to generate a total of 16 trips in the PM peak hour, with 10 inbound trips and 6 outbound trips. The daily and the AM and PM peak hour trips are shown in **Table 1**.

Table 1 –Project Trip Generation Summary

Time Period	Enter	Exit	Total
AM Peak Hour	5	13	18
PM Peak Hour	10	6	16
Daily	74	74	148

The trip distribution and assignment for the project is based on existing traffic volume patterns and local knowledge of the area. The project trips were assigned to the study intersections with 60% of the project trips to/from the north and 40% to/from the south. The PM peak hour project trips are shown in **Figure 4**. The project trips were added to the adjusted existing 2013 traffic volumes and the total volumes with the project are illustrated in **Figure 5**.

A turn lane analysis was conducted based on ITD procedures to evaluate whether or not a turn lane into the project would be warranted. The results of the warrant analysis indicate that a southbound left turn lane is warranted and is therefore recommended. The turn lane warrants for a northbound right-turn lane are not met and therefore not recommended. The detailed warrant analysis graphs are included in **Appendix 3**. In addition, the project site plan shows separate westbound left and right-turn lanes.

Level of Service (LOS) is a qualitative description of the level of congestion ranging from LOS A to LOS F. LOS A represents free-flowing traffic and LOS F represents gridlock. LOS is defined by the average delay per vehicle and is illustrated in **Table 2**.

Table 2 - Level of Service Definitions

Level of Service	Unsignalized Intersection (Delay per Seconds per Vehicle)	Signalized Intersection (Delay per Seconds per Vehicle)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

As shown in **Figure 4**, the project trips expected at the SH 75/Elkhorn Road intersection are less than 1% of the existing traffic volume at the intersection. Therefore, the project will not have a significant impact on the operations of the intersection.

The traffic operations of the SH 75/Elkhorn Road and SH 75/Lane Avenue intersections were evaluated using Synchro. A southbound left-turn lane into the project and the westbound left and right-turn lanes were included in the analysis. The results of the intersection level of service analysis for the 2013 conditions with the project are summarized in **Table 3.** The detailed output results for the delay and LOS are provided in **Appendix 4**.

Table 3 - Intersection Level of Service Summary With Project

Description		PM Peak Hour		
	Movement	Volume	Delay (sec)	LOS
SH 75/Lane Ave.	Northbound Thru	466	0.0	A
	Northbound Right	4		
	Southbound Left	6	8.5	A
	Southbound Thru	815	0.0	A
	Westbound Left	2	14.9	B
	Westbound Right	4	10.0	B
SH 75/Elkhorn Rd.	Northbound Left	4	6.3	A
	Northbound Thru	419	5.3	A
	Northbound Right	47	5.4	A
	Southbound Left	60	6.2	A
	Southbound Thru	749	6.2	A
	Southbound Right	3	6.2	A
	Eastbound Left	7	13.2	B
	Eastbound Thru	1	0.0	A
	Eastbound Right	7	0.0	A
	Westbound Left	66	14.0	B
	WEstboudn Thru	1	0.0	A
	Westbound Right	38	14.5	B
	Overall	**1,402**	**6.9**	**A**

As shown in **Table 3**, the SH 75/Elkhorn Road intersection is expected to operate at LOS "A" or better with the project traffic. The project access is expected to operate at acceptable levels of service and no additional mitigation is required or recommended.

Based on the analysis, the recommended storage for the turn lanes at the project entrance are shown in **Table 4**. The deceleration and taper are not included in the recommended storage lengths.

Table 4 – Recommended Turn Lane Storage

Movement		Recommended Storage
SH 75 /Lane Ave.	Southbound Left	195 Feet*
	Westbound Left	50 Feet
	Westbound Right	50 Feet

**ITD recommended minimum storage length is based on the the braking distance from AASHTO Greenbook for left-turn lanes.*

Conclusions

This traffic evaluation analyzed the impacts of the project on the study area intersections in accordance with the Sun Valley City Code sections 9-5A-4-D.1.b and 9-5A-4-D.2.a. The City of Sun Valley Code section 9-5A-4-D.1.b requires "Results of a preliminary traffic evaluation to identify capacity of street network, including intersections, and any improvements that will be needed as a result of the development of the master plan". The analysis with the project traffic indicated that the project will have a de minimis impact on the SH 75/Elkhorn Road intersection and the intersection is expected to operate at LOS "A" or better. Therefore, no improvements are needed for the SH 75/Elkhorn Road intersection due to the added project traffic. The Lane Avenue movements are expected to operate at LOS "B" or better and SH 75 is expected to operate without any delay on the through movements. The size of the project, consisting of 12 single family residential homes, will have a minimal impact on the City's overall integrated transportation network.

A turn lane analysis was conducted in accordance with the ITD procedures and the results indicated that a southbound left-turn lane into the project is warranted and therefore is recommended for installation. The storage for the southbound left-turn lane is 50 feet. It is also recommended that the westbound approach consist of separate left and right turn lanes with 50 feet storage each. No other mitigation measures are necessary and are therefore not recommended.

FIGURES

LANE MEADOWS

FIGURE 1
PROJECT LOCATION MAP

1

Plot Date: 10/7/2013 4:53 PM Plotted By: Imanual Aswandi
Data Created: 10/02/2013 \\SLCFILES\PUBLIC\PROJECTS\JUB\EVERGREEN VENTURES\N3-13-048_LANE RANCH TRAFFIC ANALYSIS\CAD\SHEET\N3-13-048_C-001-VICINITY.DWG

LANE MEADOWS

FIGURE 2
STUDY AREA

2

J-U-B ENGINEERS, INC.

Plot Date: 10/7/2013 4:59 PM Plotted By: Imanuel Aswandi
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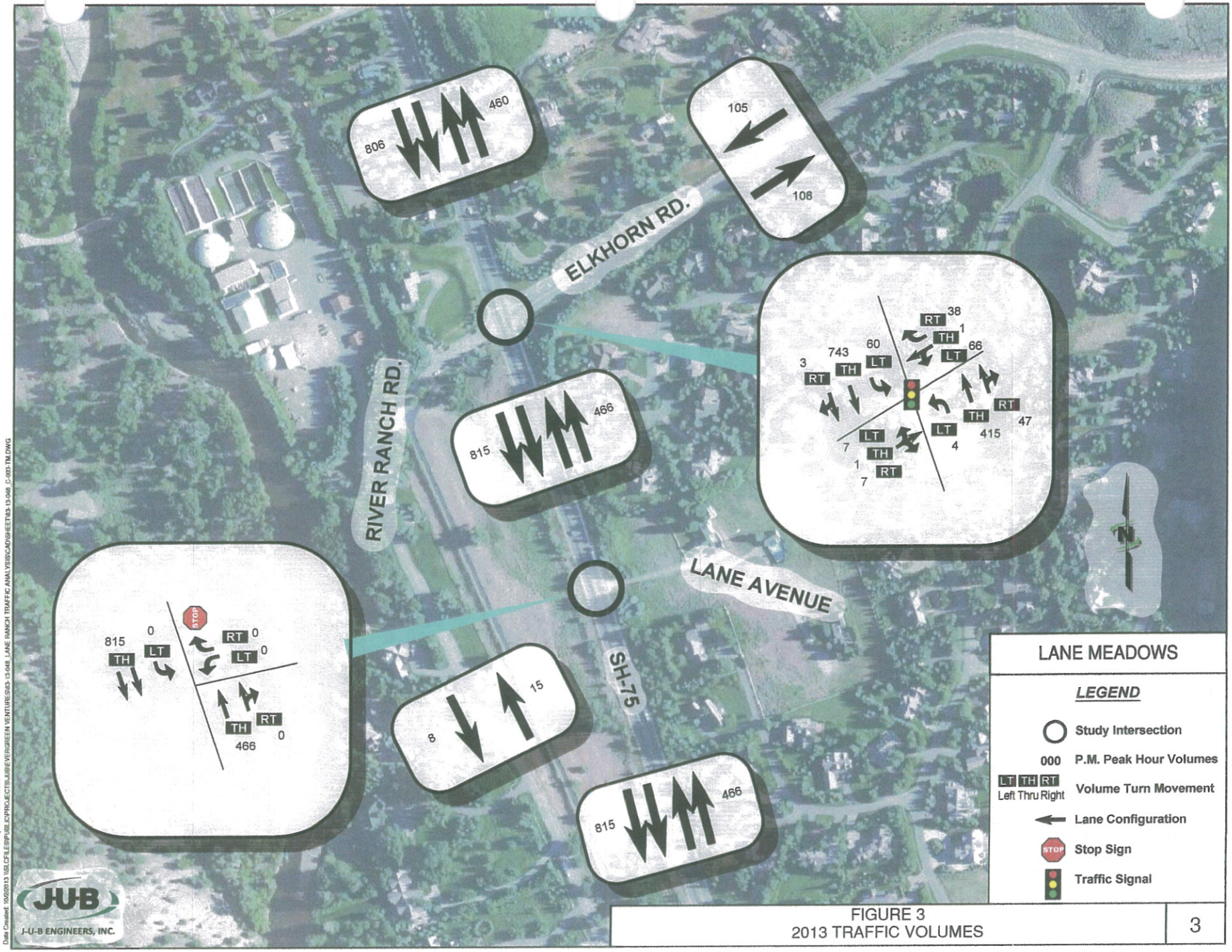

FIGURE 3
2013 TRAFFIC VOLUMES

3

Plot Date: 10/7/2013 4:59 PM Plotted By: Imanuel Aawand
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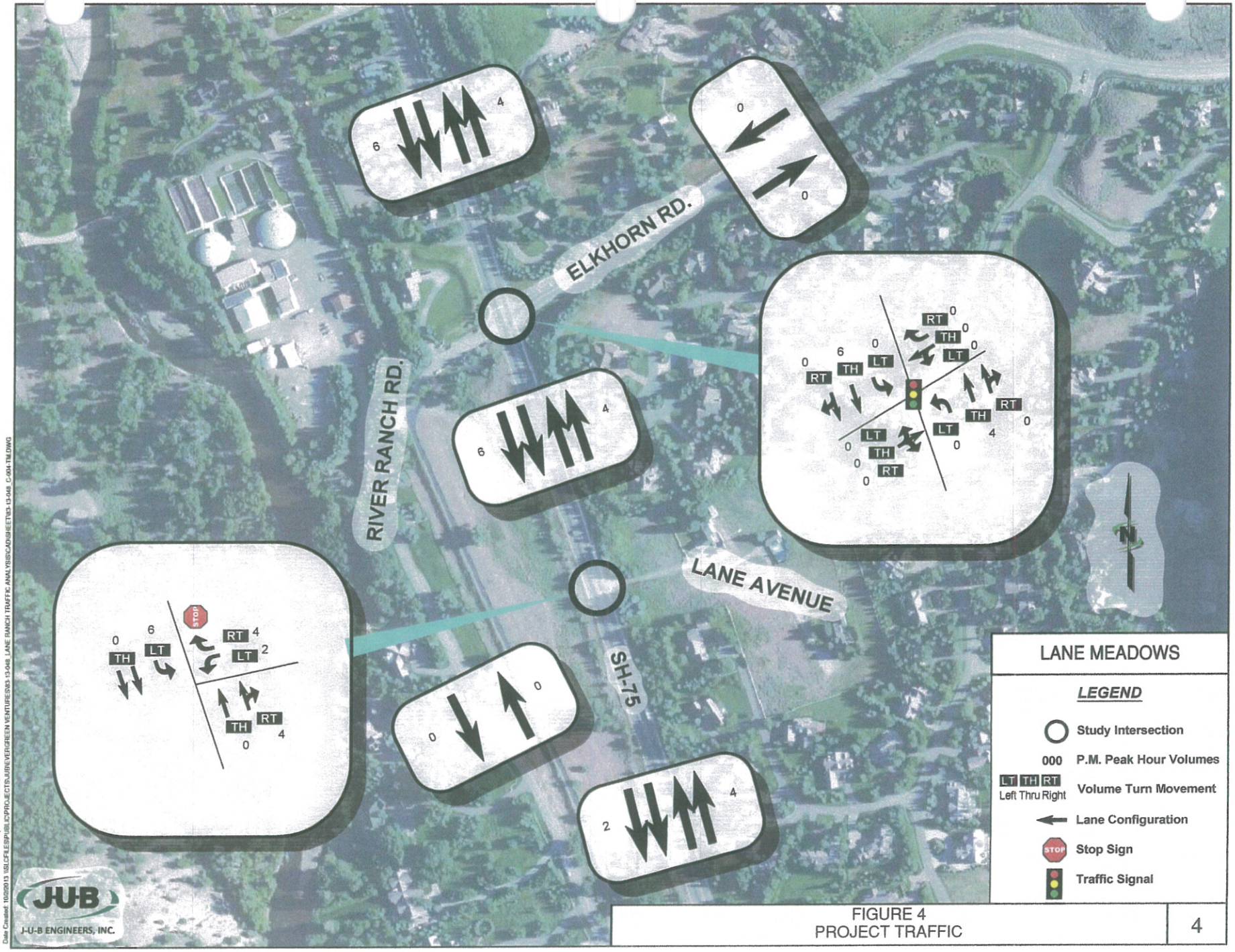

FIGURE 4
PROJECT TRAFFIC

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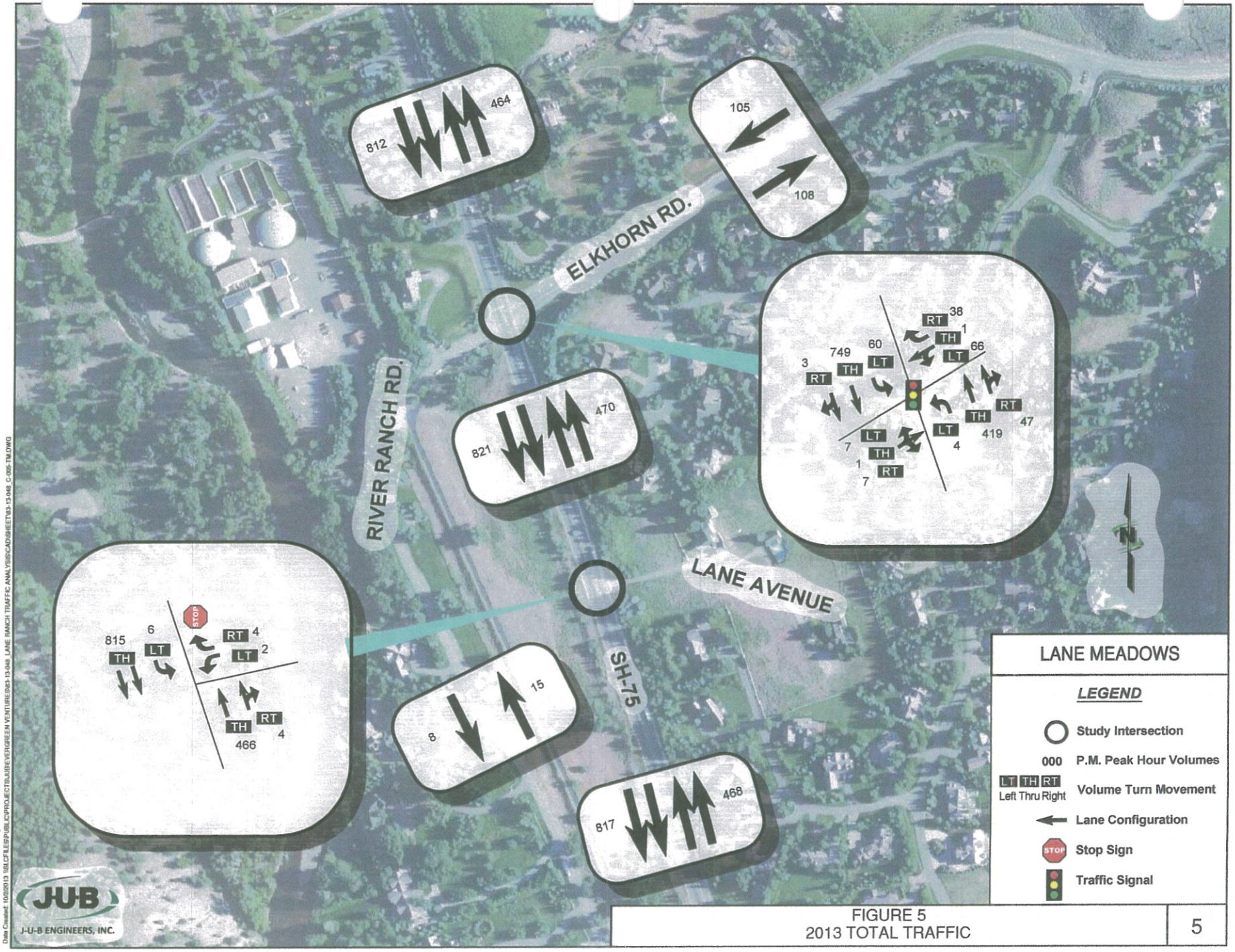

FIGURE 5
2013 TOTAL TRAFFIC

5

Plot Date: 10/7/2013 5:00 PM Plotted By: Imanuel Aswardi
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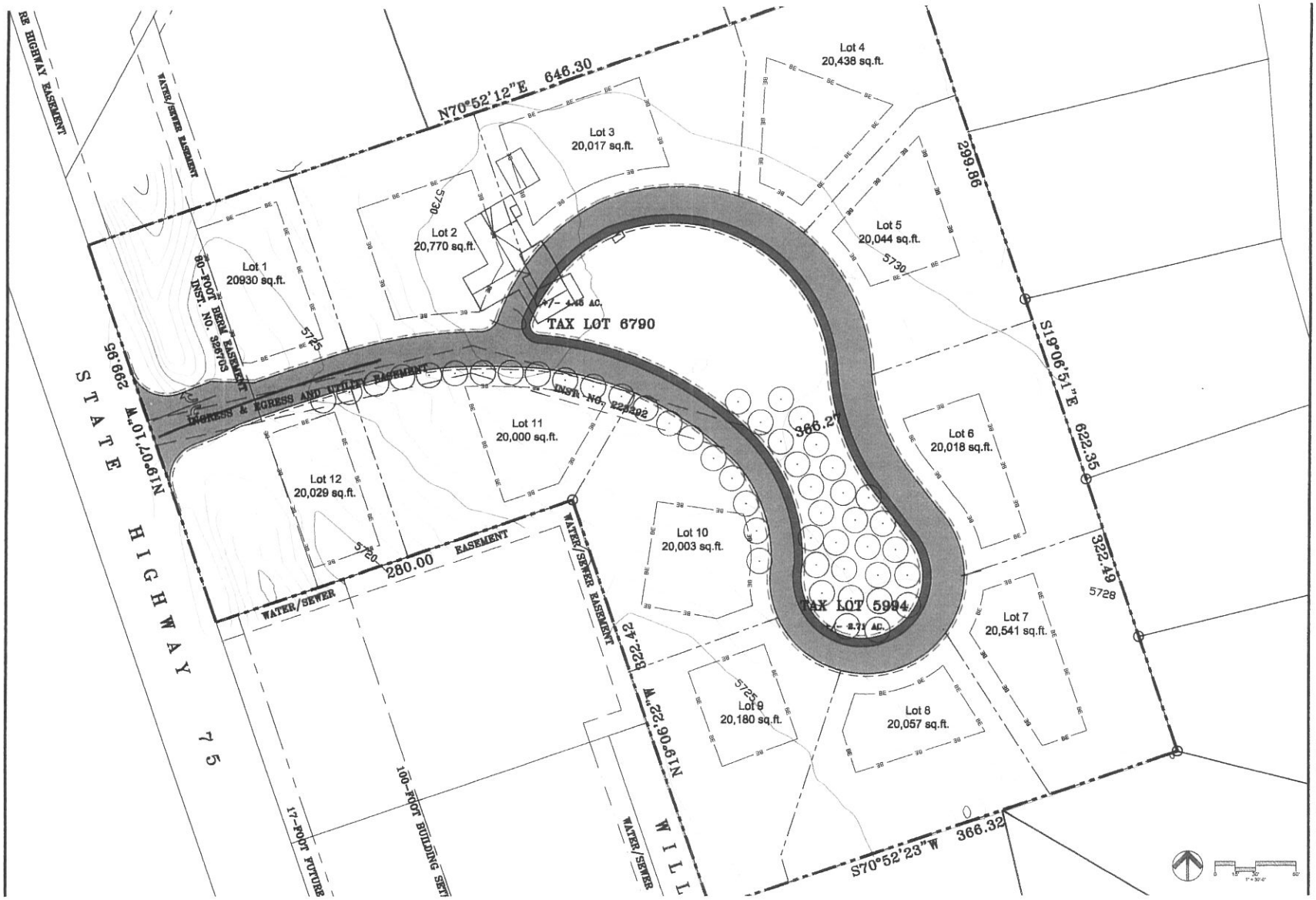
APPENDICES

APPENDIX 1 – SITE PLAN



Ben Young
Landscape Architect
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208 726.5663
ben@benyoungarchitect.com

No.	Description	APPROVAL Signature	Date

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ben young landscape architect

DRAFT
NOT FOR CONSTRUCTION

Lot Layout Overview
EVERGREEN VENTURES LLC
Lane Meadows

Date: 09.19.13
Drawn By: CG
Checked By: CG
File: 13 09-11 base.dwg

Sheet No. 1
2

APPENDIX 2 – TRAFFIC DATA

Idaho Transportation Department

Roadway, Monthly Hourly Volume for September 2012

Site Names: 00068, Hailey
County: Blaine
Funct. Class: R Minor Arterial - Other
Location: SH-75 2.9 Mi. N of Bullion St

Seasonal Factor Group: 4
Daily Factor Group: 4
Axle Factor Group: 3
Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
Sat, 01	71	38	24	28	23	86	201	399	617	851	1114	1195	967	694	1037	1216	1170	861	667	465	385	384	261	112	12,866
Sun, 02	47	38	32	19	10	75	125	254	416	590	693	780	851	750	757	833	765	655	571	385	328	383	168	88	9,613
Mon, 03	69	35	32	15	21	97	191	327	468	610	758	904	850	881	909	875	884	683	553	342	305	193	127	82	10,211
Tue, 04	32	11	10	14	18	100	437	1182	1165	957	885	907	905	987	934	1106	1386	1207	776	480	292	216	131	49	14,187
Wed, 05	25	13	7	13	27	103	383	1184	1229	842	852	827	795	853	922	1046	1309	1232	737	457	316	231	142	60	13,605
Thu, 06	19	13	7	9	22	105	384	1125	1110	831	797	857	846	851	950	1059	1342	1223	717	452	301	246	155	66	13,487
Fri, 07	35	15	17	18	15	111	358	1110	1058	783	795	831	851	940	1024	1238	1282	1167	858	514	384	264	185	118	13,971
Sat, 08	51	25	20	19	13	75	173	365	608	665	726	734	735	655	659	703	818	711	613	413	343	268	344	140	9,876
Sun, 09	116	93	36	19	15	70	113	198	370	453	598	615	611	635	601	605	633	528	421	288	285	208	109	34	7,654
Mon, 10	15	5	14	18	14	103	374	1153	1074	825	760	793	758	860	861	929	1248	1172	680	353	282	194	101	50	12,636
Tue, 11	18	16	8	11	16	90	361	1128	1123	831	760	845	828	805	972	1077	1259	1196	737	435	299	234	90	39	13,178
Wed, 12	20	18	6	13	16	103	356	1153	1125	866	768	764	789	833	928	1131	1333	1251	793	460	372	209	122	65	13,494
Thu, 13	30	14	10	11	16	99	318	1156	1081	864	818	797	791	809	957	1000	1291	1223	704	491	331	246	168	103	13,328
Fri, 14	26	14	10	15	22	97	293	1022	999	815	828	848	887	904	1038	1140	1278	1141	840	492	395	316	200	104	13,724
Sat, 15	44	35	19	10	28	76	169	353	551	726	734	740	804	814	777	786	751	580	532	374	381	327	208	122	9,941
Sun, 16	105	75	30	14	14	65	102	223	339	499	606	675	668	725	721	676	693	592	461	310	231	178	96	44	8,142
Mon, 17	20	5	14	9	21	108	352	1142	1060	794	756	779	804	818	874	980	1236	1160	651	391	282	196	103	54	12,609
Tue, 18	19	11	5	9	21	97	368	1114	1116	829	750	754	750	824	887	987	1345	1243	718	469	321	216	106	27	12,986
Wed, 19	19	11	5	11	22	97	356	1114	1174	858	791	830	809	793	887	1108	1262	1172	717	521	350	242	118	67	13,334
Thu, 20	26	15	11	14	16	107	349	1136	1128	826	824	837	830	897	953	1063	1302	1171	680	422	298	201	131	59	13,296
Fri, 21	27	25	19	11	7	101	320	1071	1035	743	763	830	819	929	979	1169	1215	1044	717	491	315	301	183	125	13,239
Sat, 22	54	27	32	16	26	92	146	352	571	679	683	753	797	733	718	698	813	604	478	397	306	273	172	108	9,528
Sun, 23	49	30	22	14	13	63	115	186	315	533	540	627	651	656	651	609	596	524	458	287	201	177	75	33	7,425
Mon, 24	19	8	13	12	17	102	344	1072	1088	756	806	765	758	806	840	1027	1166	1153	632	357	235	191	94	40	12,301
Tue, 25	17	10	9	14	13	112	348	1103	1086	808	735	788	792	793	890	1044	1240	1237	689	366	281	216	78	46	12,715
Wed, 26	21	8	6	9	14	91	359	1086	1067	862	735	770	757	798	882	1002	1247	1259	687	459	312	188	106	49	12,774
Thu, 27	20	8	15	9	14	111	362	1203	1161	796	744	739	822	813	930	1033	1296	1176	679	490	318	230	130	65	13,164
Fri, 28	31	19	9	13	19	103	319	1098	1030	817	705	844	827	906	988	1058	1269	1123	744	482	330	267	180	100	13,281
Sat, 29	46	38	20	10	22	66	155	361	612	683	731	778	717	768	781	771	736	661	542	440	317	274	185	107	9,821
Sun, 30	68	49	39	20	11	72	112	195	347	485	535	624	617	635	651	618	697	573	447	314	253	161	94	45	7,662

Idaho Transportation Department

Neg Dir, Monthly Hourly Volume for September 2012

Site Names: 00068, Hailey
County: Blaine
Funct. Class: R Minor Arterial - Other
Location: SH-75 2.9 Mi. N of Bullion St

Seasonal Factor Group: 4
Daily Factor Group: 4
Axle Factor Group: 3
Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
Sat, 01	36	19	18	12	12	30	61	122	257	271	333	286	264	270	697	865	792	566	383	268	206	215	160	73	6,216
Sun, 02	26	24	21	12	6	27	32	93	179	275	331	386	459	420	419	475	462	396	357	227	168	162	91	42	5,090
Mon, 03	44	13	22	8	9	41	56	98	197	314	476	560	535	555	596	565	592	440	339	179	164	96	77	40	6,016
Tue, 04	22	4	6	8	10	41	102	345	339	386	442	424	459	501	545	661	989	840	460	253	155	123	79	30	7,224
Wed, 05	17	5	4	7	10	34	90	311	356	312	390	403	429	460	525	644	895	817	480	271	176	116	80	38	6,870
Thu, 06	13	6	4	4	9	40	87	276	325	306	350	433	426	436	547	655	905	790	424	270	140	133	90	32	6,701
Fri, 07	20	11	11	6	6	40	75	281	296	297	366	416	434	509	537	686	829	729	491	286	174	153	104	57	6,814
Sat, 08	34	12	13	11	7	24	52	123	253	322	364	354	380	314	336	380	428	327	279	183	174	140	258	100	4,868
Sun, 09	86	83	26	17	9	31	33	81	177	211	330	317	333	390	353	356	381	311	208	149	138	109	54	25	4,208
Mon, 10	6	4	6	11	10	34	83	290	287	329	385	376	367	469	504	579	882	813	377	208	143	91	49	25	6,328
Tue, 11	15	8	6	4	7	25	64	262	330	300	326	400	424	422	566	677	862	861	451	249	150	107	57	27	6,600
Wed, 12	12	10	4	6	6	30	75	276	339	311	339	358	400	451	544	678	903	844	488	252	192	107	74	35	6,734
Thu, 13	14	7	7	7	8	30	62	260	291	308	373	382	402	428	549	596	909	829	394	286	178	131	93	43	6,587
Fri, 14	13	9	4	8	8	25	57	198	293	322	346	412	464	475	558	653	825	693	460	257	164	131	97	55	6,527
Sat, 15	20	22	14	4	11	32	44	128	223	341	413	367	379	415	396	416	388	308	286	201	202	164	123	70	4,967
Sun, 16	65	67	25	9	9	19	28	86	175	227	323	379	383	440	461	396	394	332	240	155	116	93	55	15	4,492
Mon, 17	14	3	8	3	10	36	62	260	339	305	335	370	422	414	499	584	858	803	388	240	161	84	62	27	6,287
Tue, 18	11	5	2	3	11	29	72	254	337	293	343	360	382	430	528	589	961	890	467	236	147	107	65	16	6,538
Wed, 19	13	6	3	6	9	34	62	261	375	314	350	417	397	440	511	681	866	805	424	293	192	137	76	31	6,703
Thu, 20	17	3	5	9	4	35	71	276	331	316	396	422	450	485	536	628	911	800	391	227	153	107	81	25	6,679
Fri, 21	18	12	9	2	3	34	73	257	281	261	339	410	437	514	561	672	790	676	385	301	143	147	93	49	6,467
Sat, 22	26	9	19	9	13	32	41	105	226	316	358	391	418	351	335	361	463	338	258	238	153	148	93	65	4,766
Sun, 23	28	19	14	7	6	24	40	90	148	232	287	358	389	375	370	333	350	318	257	142	99	87	33	19	4,025
Mon, 24	10	4	8	5	13	34	73	261	314	286	360	390	407	419	487	622	823	808	360	227	105	102	56	17	6,191
Tue, 25	11	6	5	6	7	32	65	242	318	305	308	380	394	425	505	645	891	881	413	201	133	112	55	17	6,357
Wed, 26	14	5	2	4	7	24	68	257	308	308	320	369	369	417	524	616	869	906	436	266	132	95	59	24	6,399
Thu, 27	10	3	9	6	4	32	76	289	310	289	339	352	409	455	549	624	910	802	409	274	142	131	69	38	6,531
Fri, 28	20	8	7	7	7	29	71	250	305	293	301	429	449	504	523	634	829	719	399	234	140	129	103	49	6,439
Sat, 29	26	24	13	9	10	25	34	98	233	317	366	354	316	417	398	405	392	370	271	257	173	145	122	74	4,849
Sun, 30	56	43	29	11	5	34	32	72	165	212	281	347	356	358	369	381	447	352	265	177	122	84	47	15	4,260

Idaho Transportation Department

Pos Dir, Monthly Hourly Volume for September 2012

Site Names: 00068, Hailey
County: Blaine
Funct. Class: R Minor Arterial - Other
Location: SH-75 2.9 Mi. N of Bullion St

Seasonal Factor Group: 4
Daily Factor Group: 4
Axle Factor Group: 3
Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
Sat, 01	35	19	6	16	11	56	140	277	360	580	781	909	703	424	340	351	378	295	284	197	179	169	101	39	6,650
Sun, 02	21	14	11	7	4	48	93	161	237	315	362	394	392	330	338	358	303	259	214	158	160	221	77	46	4,523
Mon, 03	25	22	10	7	12	56	135	229	271	296	282	344	315	326	313	310	292	243	214	163	141	97	50	42	4,195
Tue, 04	10	7	4	6	8	59	335	837	826	571	443	483	446	486	389	445	397	367	316	227	137	93	52	19	6,963
Wed, 05	8	8	3	6	17	69	293	873	873	530	462	424	366	393	397	402	414	415	257	186	140	115	62	22	6,735
Thu, 06	6	7	3	5	13	65	297	849	785	525	447	424	420	415	403	404	437	433	293	182	161	113	65	34	6,786
Fri, 07	15	4	6	12	9	71	283	829	762	486	429	415	417	431	487	552	453	438	367	228	210	111	81	61	7,157
Sat, 08	17	13	7	8	6	51	121	242	355	343	362	380	355	341	323	323	390	384	334	230	169	128	86	40	5,008
Sun, 09	30	10	10	2	6	39	80	117	193	242	268	298	278	245	248	249	252	217	213	139	147	99	55	9	3,446
Mon, 10	9	1	8	7	4	69	291	863	787	496	375	417	391	391	357	350	366	359	303	145	139	103	52	25	6,308
Tue, 11	3	8	2	7	9	65	297	866	793	531	434	445	404	383	406	400	397	335	286	186	149	127	33	12	6,578
Wed, 12	8	8	2	7	10	73	281	877	786	555	429	406	389	382	384	453	430	407	305	208	180	102	48	30	6,760
Thu, 13	16	7	3	4	8	69	256	896	790	556	445	415	389	381	408	404	382	394	310	205	153	115	75	60	6,741
Fri, 14	13	5	6	7	14	72	236	824	706	493	482	436	423	429	480	487	453	448	380	235	231	185	103	49	7,197
Sat, 15	24	13	5	6	17	44	125	225	328	385	321	373	425	399	381	370	363	272	246	173	179	163	85	52	4,974
Sun, 16	40	8	5	5	5	46	74	137	164	272	283	296	285	285	260	280	299	260	221	155	115	85	41	29	3,650
Mon, 17	6	2	6	6	11	72	290	882	721	489	421	409	382	404	375	396	378	357	263	151	121	112	41	27	6,322
Tue, 18	8	6	3	6	10	68	296	860	779	536	407	394	368	394	359	398	384	353	251	233	174	109	41	11	6,448
Wed, 19	6	5	2	5	13	63	294	853	799	544	441	413	412	353	376	427	396	367	293	228	158	105	42	36	6,631
Thu, 20	9	12	6	5	12	72	278	860	797	510	428	415	380	412	417	435	391	371	289	195	145	94	50	34	6,617
Fri, 21	9	13	10	9	4	67	247	814	754	482	424	420	382	415	418	497	425	368	332	190	172	154	90	76	6,772
Sat, 22	28	18	13	7	13	60	105	247	345	363	325	362	379	382	383	337	350	266	220	159	153	125	79	43	4,762
Sun, 23	21	11	8	7	7	39	75	96	167	301	253	269	262	281	281	276	246	206	201	145	102	90	42	14	3,400
Mon, 24	9	4	5	7	4	68	271	811	774	470	446	375	351	387	353	405	343	345	272	130	130	89	38	23	6,110
Tue, 25	6	4	4	8	6	80	283	861	768	503	427	408	398	368	385	399	349	356	276	165	148	104	23	29	6,358
Wed, 26	7	3	4	5	7	67	291	829	759	554	415	401	388	381	358	386	378	353	251	193	180	93	47	25	6,375
Thu, 27	10	5	6	3	10	79	286	914	851	507	405	387	413	358	381	409	386	374	270	216	176	99	61	27	6,633
Fri, 28	11	11	2	6	12	74	248	848	725	524	404	415	378	402	465	424	440	404	345	248	190	138	77	51	6,842
Sat, 29	20	14	7	1	12	41	121	263	379	366	365	424	401	351	383	366	344	291	271	183	144	129	63	33	4,972
Sun, 30	12	6	10	9	6	38	80	123	182	273	254	277	261	277	282	237	250	221	182	137	131	77	47	30	3,402

L2 Data Collection

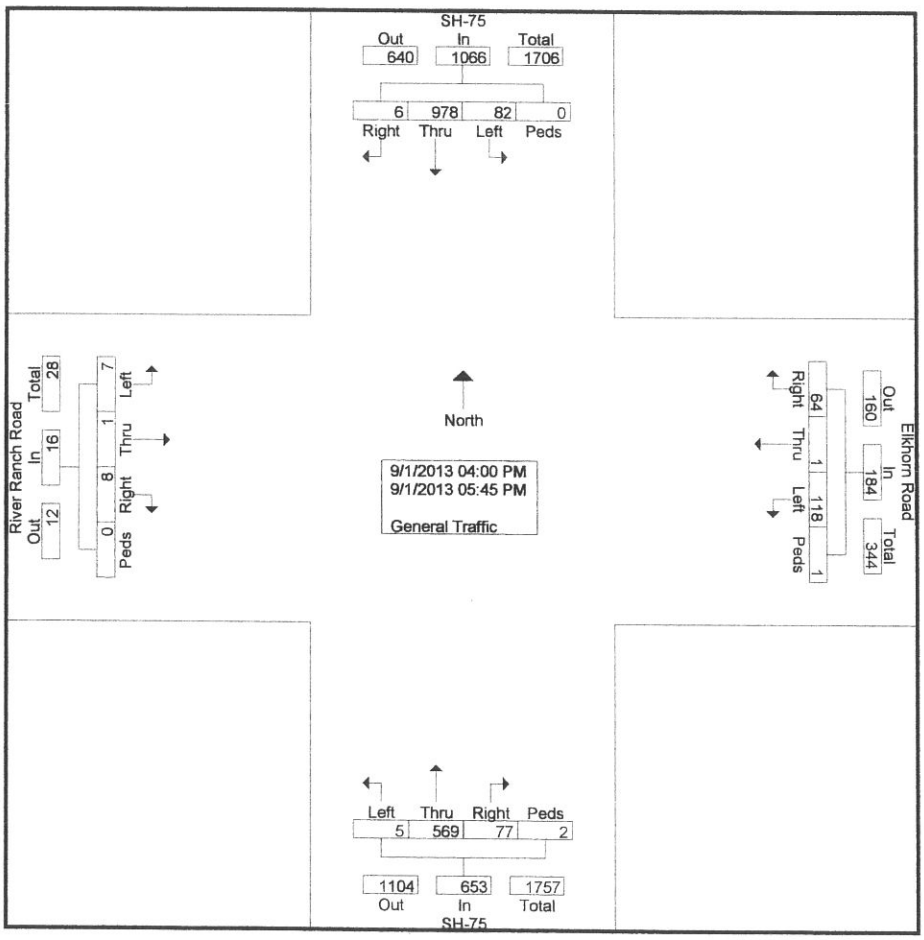
www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: JUB
Intersection: Hwy 75 / Elkhorn Road
City, State: Sun Valley, Idaho
Control: Signalized

File Name : Hwy 75 Elkhorn PM
Site Code : 00000000
Start Date : 9/1/2013
Page No : 1

Groups Printed- General Traffic

	SH-75 From North					Elkhorn Road From East					SH-75 From South					River Ranch Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	2	123	11	0	136	5	0	20	0	25	9	65	2	0	76	1	0	1	0	2	239
04:15 PM	0	123	10	0	133	6	1	12	0	19	7	93	1	0	101	3	0	2	0	5	258
04:30 PM	0	129	9	0	138	6	0	5	0	11	6	70	0	0	76	1	0	0	0	1	226
04:45 PM	1	134	7	0	142	6	0	8	0	14	6	74	1	0	81	1	0	2	0	3	240
Total	3	509	37	0	549	23	1	45	0	69	28	302	4	0	334	6	0	5	0	11	963
05:00 PM	1	132	16	0	149	8	0	20	1	29	14	53	1	2	70	0	1	1	0	2	250
05:15 PM	0	118	12	0	130	11	0	19	0	30	12	74	0	0	86	0	0	1	0	1	247
05:30 PM	2	115	10	0	127	12	0	19	0	31	11	67	0	0	78	0	0	0	0	0	236
05:45 PM	0	104	7	0	111	10	0	15	0	25	12	73	0	0	85	2	0	0	0	2	223
Total	3	469	45	0	517	41	0	73	1	115	49	267	1	2	319	2	1	2	0	5	956
Grand Total	6	978	82	0	1066	64	1	118	1	184	77	569	5	2	653	8	1	7	0	16	1919
Apprch %	0.6	91.7	7.7	0		34.8	0.5	64.1	0.5		11.8	87.1	0.8	0.3		50	6.2	43.8	0		
Total %	0.3	51	4.3	0	55.5	3.3	0.1	6.1	0.1	9.6	4	29.7	0.3	0.1	34	0.4	0.1	0.4	0	0.8	



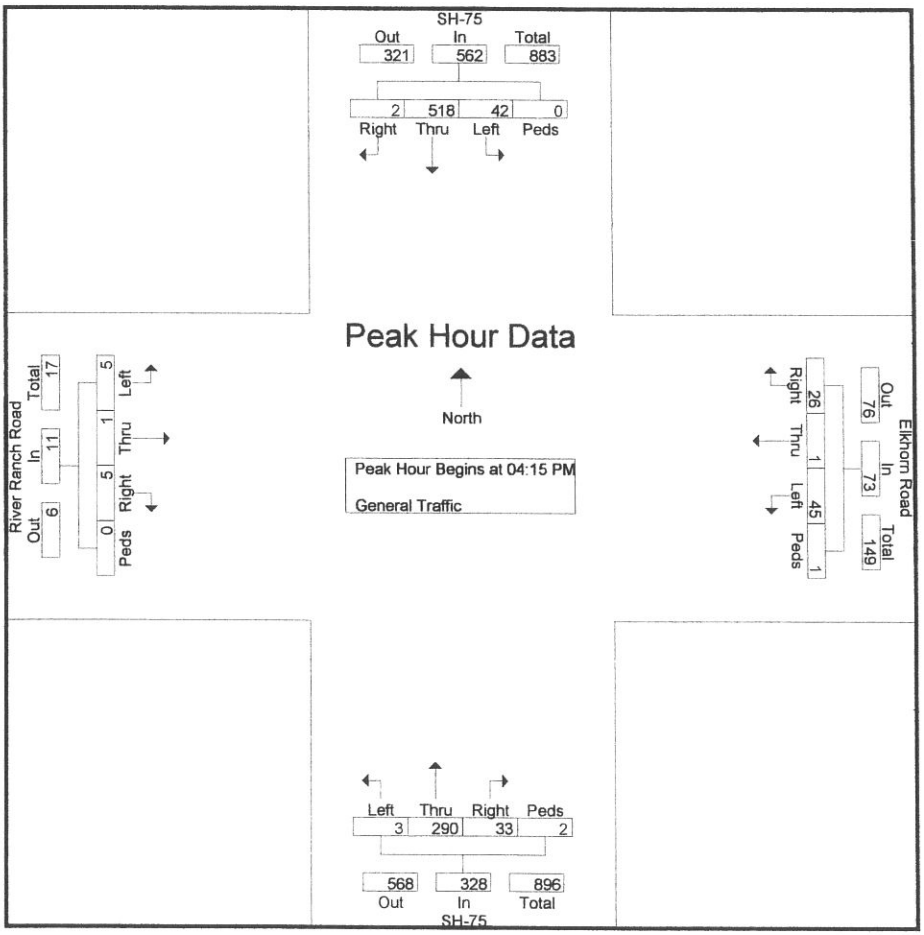
L2 Data Collection

www.L2DataCollection.com
Idaho (208) 860-7554 Utah (801) 413-2993

Project: JUB
Intersection: Hwy 75 / Elkhorn Road
City, State: Sun Valley, Idaho
Control: Signalized

File Name : Hwy 75 Elkhorn PM
Site Code : 00000000
Start Date : 9/1/2013
Page No : 2

	SH-75 From North					Elkhorn Road From East					SH-75 From South					River Ranch Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	123	10	0	133	6	1	12	0	19	7	**93**	1	0	**101**	**3**	0	**2**	0	**5**	**258**
04:30 PM	0	129	9	0	138	6	0	5	0	11	6	70	0	0	76	1	0	0	0	1	226
04:45 PM	1	**134**	7	0	142	6	0	8	0	14	6	74	1	0	81	1	0	2	0	3	240
05:00 PM	1	132	**16**	0	**149**	**8**	0	**20**	**1**	**29**	**14**	53	1	**2**	70	0	**1**	1	0	2	250
Total Volume	2	518	42	0	562	26	1	45	1	73	33	290	3	2	328	5	1	5	0	11	974
% App. Total	0.4	92.2	7.5	0		35.6	1.4	61.6	1.4		10.1	88.4	0.9	0.6		45.5	9.1	45.5	0		
PHF	.500	.966	.656	.000	.943	.813	.250	.563	.250	.629	.589	.780	.750	.250	.812	.417	.250	.625	.000	.550	.944



L2 Data Collection

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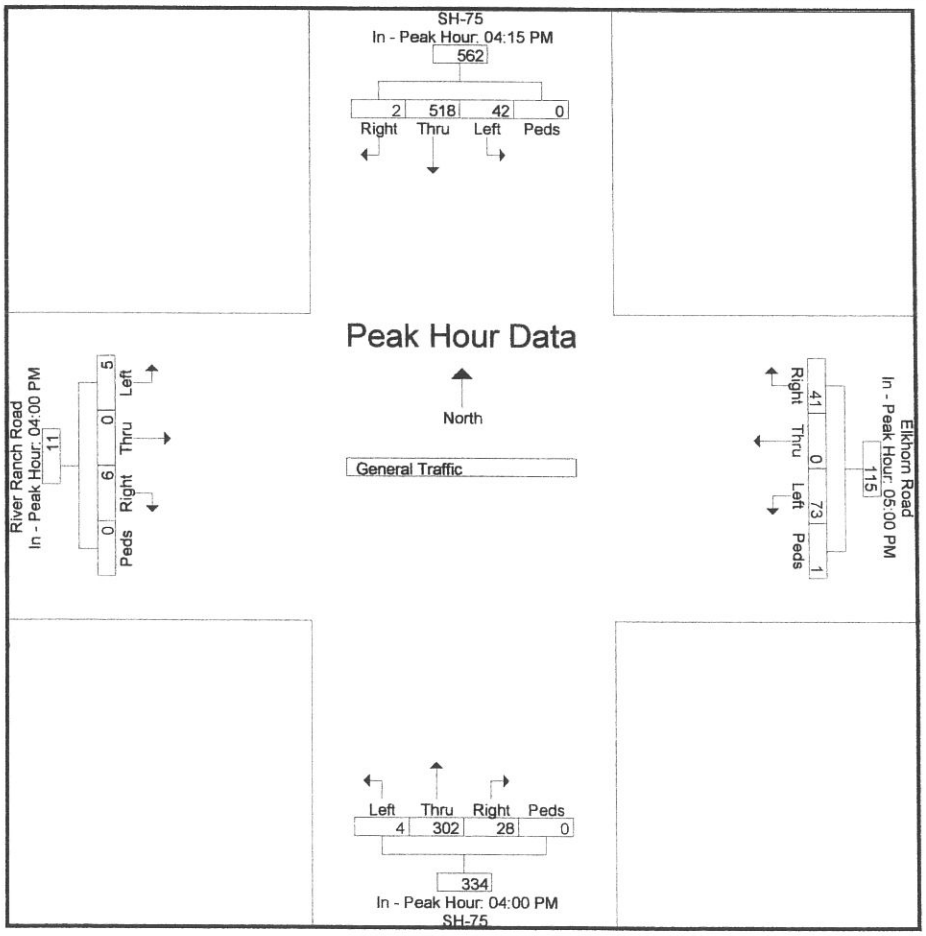
Idaho (208) 860-7554 Utah (801) 413-2993

Project: JUB
Intersection: Hwy 75 / Elkhorn Road
City, State: Sun Valley, Idaho
Control: Signalized

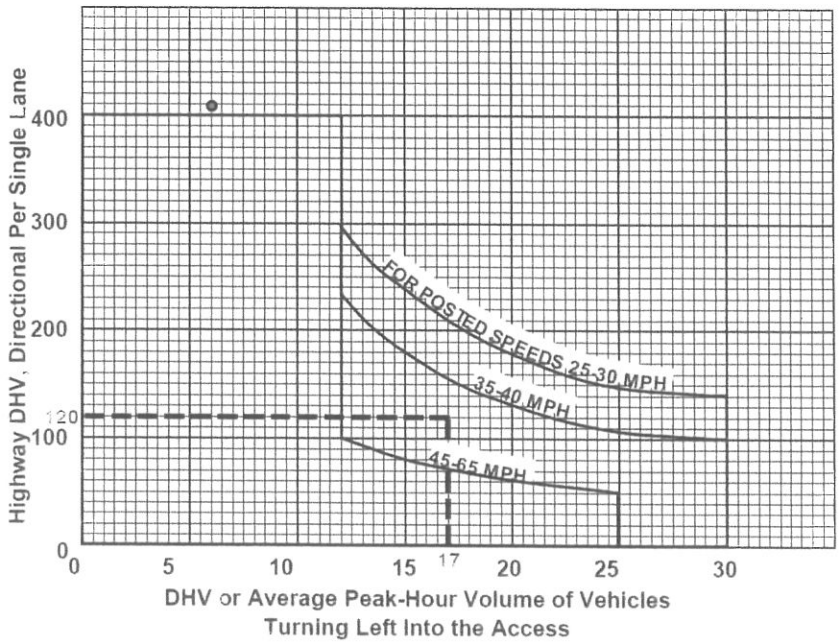
File Name : Hwy 75 Elkhorn PM
Site Code : 00000000
Start Date : 9/1/2013
Page No : 3

	SH-75 From North					Elkhorn Road From East					SH-75 From South					River Ranch Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:15 PM					05:00 PM					04:00 PM					04:00 PM					
+0 mins.	0	123	10	0	133	8	0	**20**	1	29	**9**	65	**2**	0	76	1	0	1	0	2	
+15 mins.	0	129	9	0	138	11	0	19	0	30	7	**93**	1	0	**101**	**3**	0	**2**	0	**5**	
+30 mins.	**1**	**134**	7	0	142	**12**	0	19	0	**31**	6	70	0	0	76	1	0	0	0	1	
+45 mins.	1	132	**16**	0	**149**	10	0	15	0	25	6	74	1	0	81	1	0	2	0	3	
Total Volume	2	518	42	0	562	41	0	73	1	115	28	302	4	0	334	6	0	5	0	11	
% App. Total	0.4	92.2	7.5	0		35.7	0	63.5	0.9		8.4	90.4	1.2	0		54.5	0	45.5	0		
PHF	.500	.966	.656	.000	.943	.854	.000	.913	.250	.927	.778	.812	.500	.000	.827	.500	.000	.625	.000	.550	

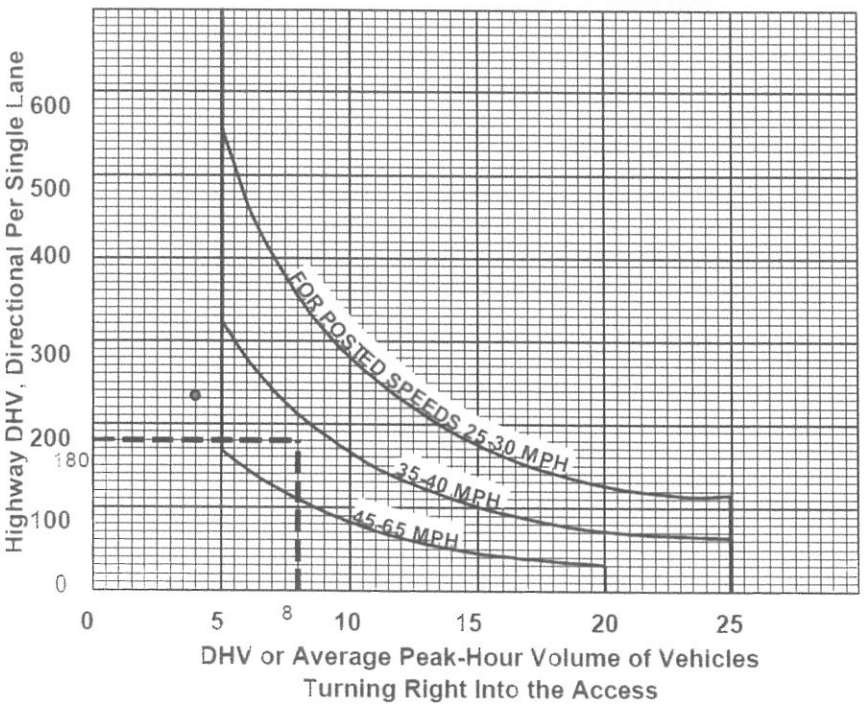


APPENDIX 3 – TURN LANE WARRANT ANALYSIS

LEFT-TURN LANE WARRANT



RIGHT-TURN LANE WARRANT



APPENDIX 4 – LOS RESULTS

Lanes and Geometrics
1: SH-75 & River Ranch Rd./Elkhorn Rd.

10/7/2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		100	125		0	225		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	25			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.937				0.850		0.985			0.999	
Flt Protected		0.977			0.953		0.950			0.950		
Satd. Flow (prot)	0	1705	0	0	1775	1583	1770	3396	0	1770	3435	0
Flt Permitted		0.799			0.710		0.349			0.436		
Satd. Flow (perm)	0	1395	0	0	1323	1583	650	3396	0	812	3435	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				73		30			1	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		408			524			754			411	
Travel Time (s)		11.1			10.2			14.7			8.0	

Intersection Summary

Area Type: Other

Volume
1: SH-75 & River Ranch Rd./Elkhorn Rd.

10/7/2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	7	1	7	66	1	38	4	419	47	60	749	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.55	0.55	0.55	0.63	0.63	0.63	0.81	0.81	0.81	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	2	13	105	2	60	5	517	58	64	797	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	107	60	5	575	0	64	800	0

Intersection Summary

HCM 2010 Signalized Intersection Summary
1: SH-75 & River Ranch Rd./Elkhorn Rd.

10/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	1	7	66	1	38	4	419	47	60	749	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	190.0	186.3	190.0	190.0	186.3	186.3	186.3	181.5	190.0	186.3	181.0	190.0
Lanes	0	1	0	0	1	1	1	2	0	1	2	0
Cap, veh/h	201	33	63	398	3	179	480	1668	187	577	1874	7
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	356	292	561	1593	30	1583	677	3208	359	835	3603	14
Grp Volume(v), veh/h	28	0	0	107	0	60	5	292	283	64	400	400
Grp Sat Flow(s),veh/h/ln	1209	0	0	1623	0	1583	677	1815	1751	835	1810	1807
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.1	0.1	3.0	3.0	1.6	4.5	4.5
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.8	0.0	1.1	4.6	3.0	3.0	4.6	4.5	4.5
Prop In Lane	0.46		0.46	0.98		1.00	1.00		0.20	1.00		0.01
Lane Grp Cap(c), veh/h	298	0	0	401	0	179	480	944	911	577	941	940
V/C Ratio(X)	0.09	0.00	0.00	0.27	0.00	0.34	0.01	0.31	0.31	0.11	0.43	0.43
Avail Cap(c_a), veh/h	852	0	0	928	0	775	480	944	911	577	941	940
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.1	0.0	0.0	13.6	0.0	13.4	6.3	4.5	4.5	5.8	4.8	4.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	1.1	0.0	0.9	0.9	0.4	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.2	0.0	0.0	0.7	0.0	0.4	0.0	0.9	0.9	0.2	1.3	1.3
Lane Grp Delay (d), s/veh	13.2	0.0	0.0	14.0	0.0	14.5	6.3	5.3	5.4	6.2	6.2	6.2
Lane Grp LOS	B			B		B	A	A	A	A	A	A
Approach Vol, veh/h		28			167			580			864	
Approach Delay, s/veh		13.2			14.2			5.4			6.2	
Approach LOS		B			B			A			A	

Timer				
Assigned Phs	4	8	2	6
Phs Duration (G+Y+Rc), s	9.7	9.7	23.0	23.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	16.0	16.0	17.0	17.0
Max Q Clear Time (g_c+I1), s	3.8	3.8	6.6	6.6
Green Ext Time (p_c), s	0.7	0.7	5.9	5.9

Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	50		0	50	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3436	0	1770	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	3436	0	1770	3438
Link Speed (mph)	25		45			45
Link Distance (ft)	461		731			754
Travel Time (s)	12.6		11.1			11.4

Intersection Summary

Area Type: Other

Intersection	
Intersection Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	2	4	466	4	6	815
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	50	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	2	5	530	5	7	926

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1009	267	0	0	534	0
Stage 1	532	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Follow-up Headway	3.52	3.32	-	-	2.22	-
Pot Capacity-1 Maneuver	237	731	-	-	1030	-
Stage 1	553	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	235	731	-	-	1030	-
Mov Capacity-2 Maneuver	367	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	586	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	367	731	1030	-
HCM Lane V/C Ratio	-	-	0.006	0.006	0.007	-
HCM Control Delay (s)	-	-	14.9	10	8.518	-
HCM Lane LOS			B	B	A	
HCM 95th %tile Q(veh)	-	-	0.019	0.019	0.02	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined