Course Project
Traffic Impact Analysis of the Proposed UNR Research Center

Due: Tuesday, May 9th, 2006

Project Description

As part of the future expansion plan of the UNR campus, a 500,000 s.f. Research and Development Center (ITE Lane Use Code: 760) is planned on the north side of the campus. The project is expected to be completed and fully occupied by the end of 2010 (4 years from now). All the traffic entering and exiting the site will be via the 17th Street. You are required to submit a traffic impact report due to the development of the research center. You only need to analyze the traffic conditions during the weekday p.m. peak period. You need to analyze two signalized intersections which will be affected by the project: (1) N. Virginia Street/McCarran Blvd.; and (2) N. Virginia Street/15th Street. You are also required to conduct a peak-hour signal warrant analysis for the intersection at Virginia Street/17th Street. The following information has been collected and can be used for the project.

1. Traffic demand counts during the weekday p.m. peak period have been obtained between the years of 2001 and 2003, and the data are attached for the study intersections. Assume these traffic volumes represent the existing traffic volumes.
2. Due to normal growth of the Reno metropolitan area, it is anticipated that the traffic demands will grow at a rate of 5% per year. Therefore, the traffic demands at the intersections will be higher than existing even without the proposed research center (The traffic demands at year 2010 without the project-generated traffic is referred to as the background traffic conditions).
3. Based on the travel survey, an estimate on the trip distribution is obtained and is shown in Figure 1. For example, about 30% of the project-generated trips will be coming from and going to west on McCarran Blvd. Using these trip distribution percentages, the projected-generated traffic can be distributed to the study intersections to derive the total traffic volumes when the project is completed.

4. City of Reno requires all intersections to operate at LOS D or better. Otherwise, appropriate mitigation measures (signal timing, adding lanes etc.) must be provided (including existing conditions).

Project Requirements

You are encouraged to form a group of 3 ~ 4 students to work on the project. You will need to submit a group report, documenting the major analysis results, findings and recommendations. The report must have a section, where each student's contributions to the project (tasks and % contribution) must be clearly stated. At a minimum, the report should include the following:

1. Description of the project background, major findings and conclusions from the study.
2. Description of the field data collection efforts, i.e., what necessary data did you collect in the field for completing the study?
3. Analysis of the existing traffic operations (v/c ratios, LOS). Include necessary figures and tables to enhance your report. If the LOS does not meet City of Reno's requirements of LOS D, provide mitigation measures to achieve LOS D.
4. Analysis of the background traffic conditions (year 2010).
5. Analysis of the background plus project conditions.
6. Analysis of the peak-hour signal warrant for the intersection of Virginia/17th Street.

** Note: Clearly state all the assumptions behind your analyses, such as using defaults of saturation flow rates, signal timing, % trucks etc. Attach necessary software outputs to support your results.*

Grading

1. Technical contents (details, accuracy): 60%
2. Writing: 25%
3. Neatness of report: 15%

*** Individual grade for each member of the group will be determined based on the % contributions.*

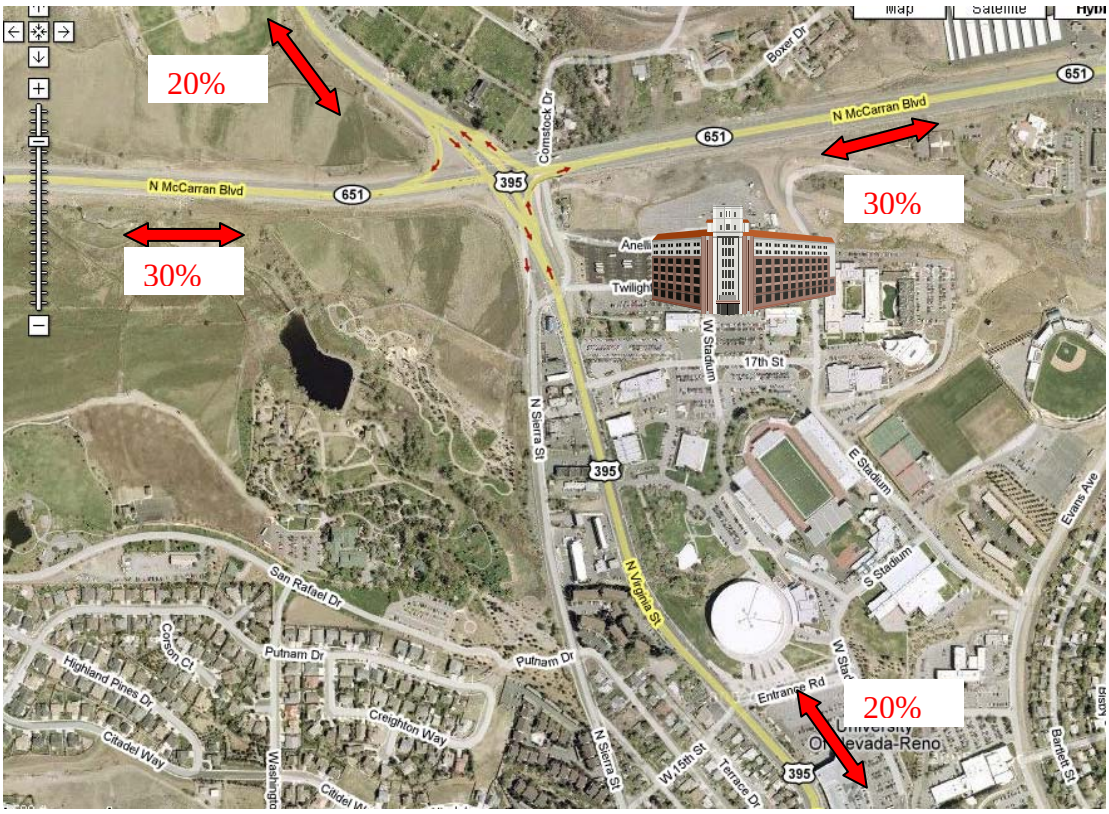


Figure 1 Site Vicinity and Traffic Distribution

Research and Development Center
(760)

Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
P.M. Peak Hour

Number of Studies: 34
Average 1000 Sq. Feet GFA: 306
Directional Distribution: 15% entering, 85% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.08	0.40 - 4.13	1.19

Data Plot and Equation

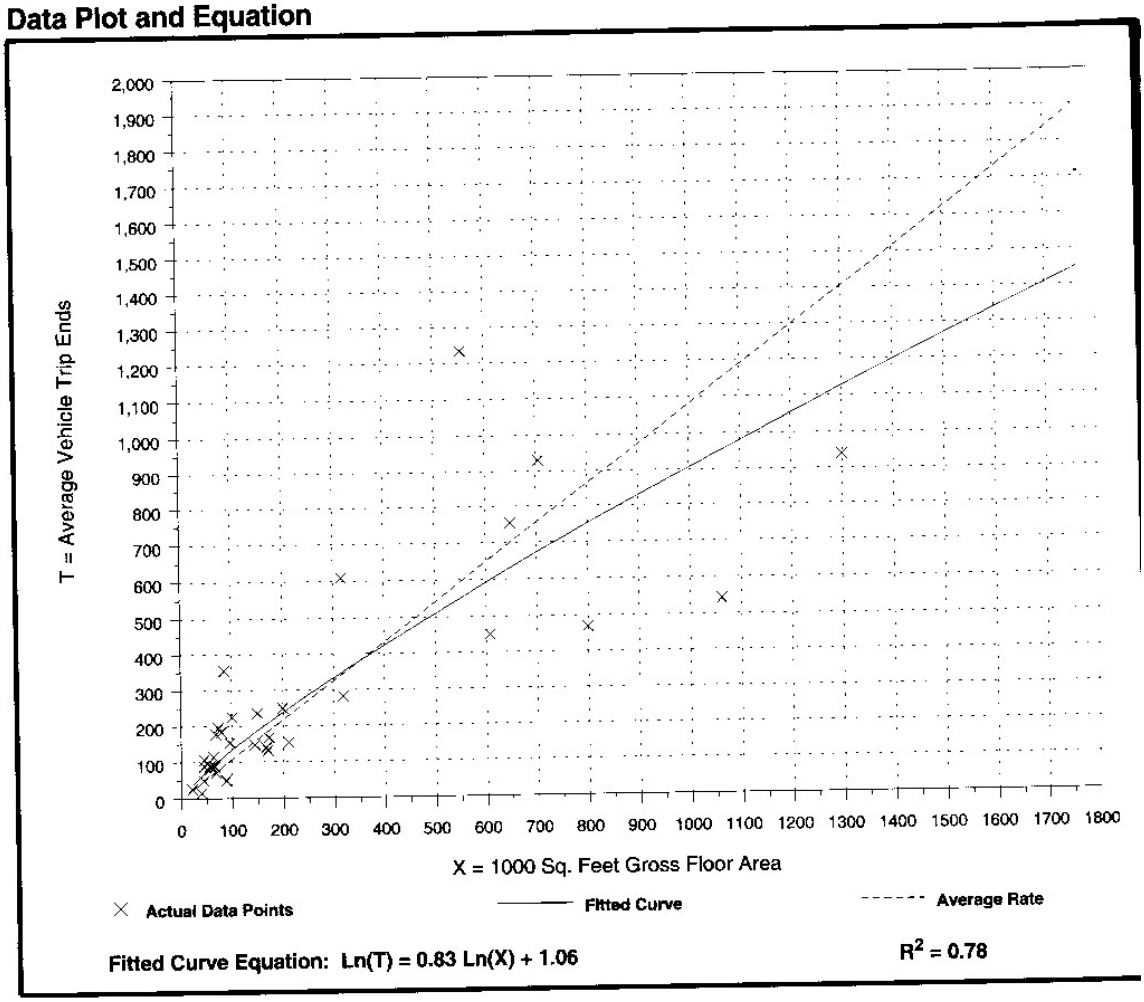
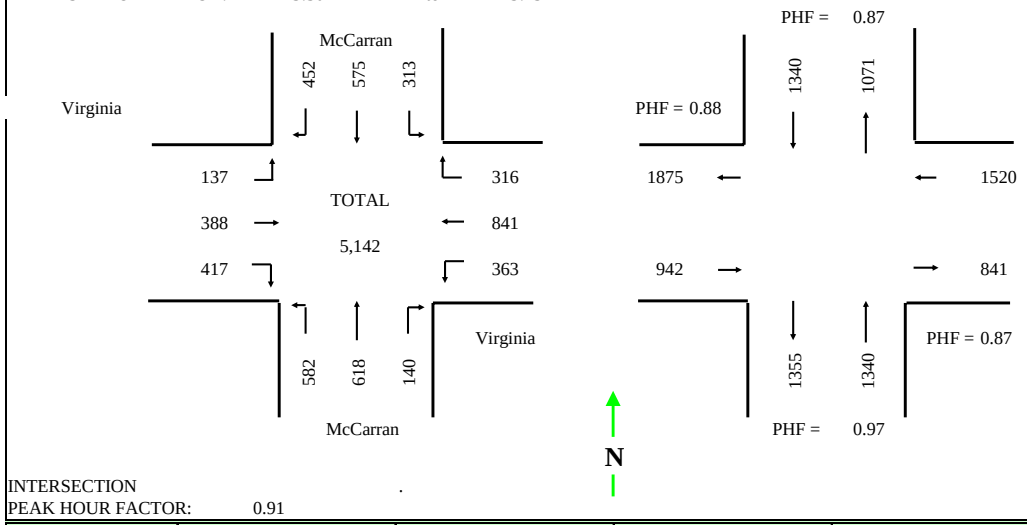


Figure 2 Trip Generation Chart

INTERSECTION TURNING MOVEMENT SUMMARY

INTERSECTION: N. Virginia and N McCarran **TIME:** 4:00 PM to 6:00 PM
DATE: WED 9/18/02
PROJECT TITLE: Peavine **PROJECT NO:**

PEAK HOUR PERIOD: 5:00 PM to 6:00 PM
PEAK 15 MINUTE PERIOD: 5:30 PM to 5:45 PM



INTERSECTION PEAK HOUR FACTOR: 0.91

RUNNING COUNTS	McCarran Eastbound			McCarran Westbound			Virginia Northbound			Virginia Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
4:15 PM	49	121	95	95	135	86	111	149	38	95	137	55	1166
4:30 PM	77	198	177	197	279	162	226	274	51	153	246	121	2161
4:45 PM	110	277	286	251	447	248	349	390	80	227	306	174	3145
5:00 PM	135	364	346	317	570	312	438	518	111	290	442	202	4045
5:15 PM	171	453	458	391	792	451	591	675	145	351	578	352	5408
5:30 PM	198	551	561	500	984	482	756	798	196	419	699	468	6612
5:45 PM	242	664	672	594	1240	561	903	952	230	523	870	576	8027
6:00 PM	272	752	763	680	1411	628	1020	1136	251	603	1017	654	9187

PERIOD COUNTS

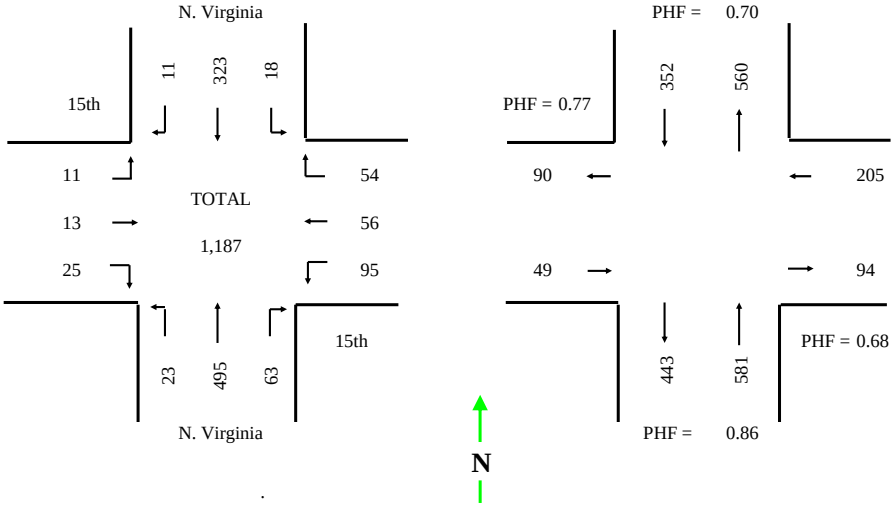
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
4:15 PM	49	121	95	95	135	86	111	149	38	95	137	55	1166
4:30 PM	28	77	82	102	144	76	115	125	13	58	109	66	995
4:45 PM	33	79	109	54	168	86	123	116	29	74	60	53	984
5:00 PM	25	87	60	66	123	64	89	128	31	63	136	28	900
5:15 PM	36	89	112	74	222	139	153	157	34	61	136	150	1363
5:30 PM	27	98	103	109	192	31	165	123	51	68	121	116	1204
5:45 PM	44	113	111	94	256	79	147	154	34	104	171	108	1415
6:00 PM	30	88	91	86	171	67	117	184	21	80	147	78	1160

HOURLY TOTALS

Beginning At	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
4:00 PM	135	364	346	317	570	312	438	518	111	290	442	202	4045
4:15 PM	122	332	363	296	657	365	480	526	107	256	441	297	4242
4:30 PM	121	353	384	303	705	320	530	524	145	266	453	347	4451
4:45 PM	132	387	386	343	793	313	554	562	150	296	564	402	4882
5:00 PM	137	388	417	363	841	316	582	618	140	313	575	452	5142

INTERSECTION: 15th / N. Virginia **TIME:** 4:00 PM to 6:00 PM
JURISDICTION: City of Reno **DATE:** 5-16-01, Wed
PROJECT TITLE: Central City Master Circulation Plan **PROJECT NO:** 1016-0018

PEAK HOUR PERIOD: 4:00 PM to 5:00 PM
PEAK 15 MINUTE PERIOD: 4:45 PM to 5:00 PM



INTERSECTION PEAK HOUR FACTOR: 0.85

RUNNING COUNTS	15th Eastbound			15th Westbound			N. Virginia Northbound			N. Virginia Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
4:15 PM	5	4	7	29	13	15	3	113	24	6	118	2	339
4:30 PM	5	7	13	44	25	21	7	219	38	11	164	4	558
4:45 PM	7	11	19	60	37	33	14	348	51	13	240	5	838
5:00 PM	11	13	25	95	56	54	23	495	63	18	323	11	1187
5:15 PM	12	14	27	113	62	71	28	620	69	19	377	15	1427
5:30 PM	14	17	36	121	69	86	39	748	81	20	440	18	1689
5:45 PM	16	23	40	139	80	92	44	828	87	25	491	19	1884
6:00 PM	17	24	42	148	86	99	48	937	95	29	535	20	2080

PERIOD COUNTS

Period End	A	B	C	D	E	F	G	H	I	J	K	L	TOTAL
4:15 PM	5	4	7	29	13	15	3	113	24	6	118	2	339
4:30 PM	0	3	6	15	12	6	4	106	14	5	46	2	219
4:45 PM	2	4	6	16	12	12	7	129	13	2	76	1	280
5:00 PM	4	2	6	35	19	21	9	147	12	5	83	6	349
5:15 PM	1	1	2	18	6	17	5	125	6	1	54	4	240
5:30 PM	2	3	9	8	7	15	11	128	12	1	63	3	262
5:45 PM	2	6	4	18	11	6	5	80	6	5	51	1	195
6:00 PM	1	1	2	9	6	7	4	109	8	4	44	1	196

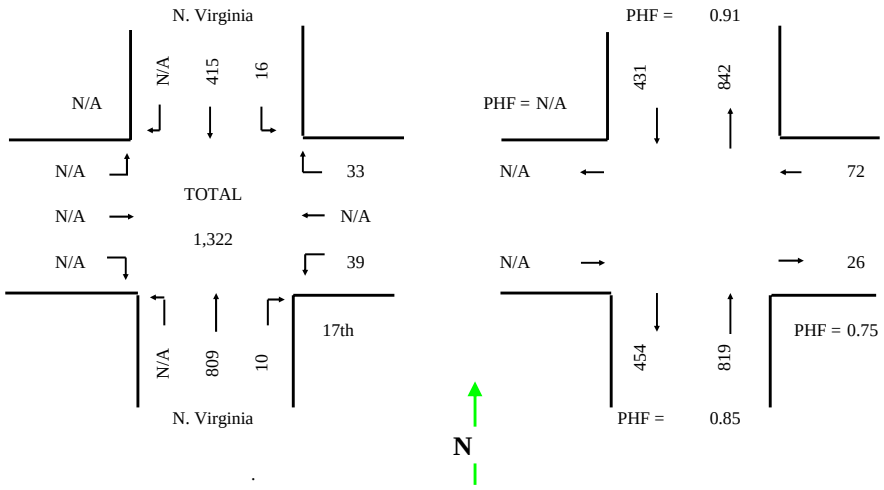
HOURLY TOTALS

Beginning At	A	B	C	D	E	F	G	H	I	J	K	L	TOTAL
4:00 PM	11	13	25	95	56	54	23	495	63	18	323	11	1187
4:15 PM	7	10	20	84	49	56	25	507	45	13	259	13	1088
4:30 PM	9	10	23	77	44	65	32	529	43	9	276	14	1131
4:45 PM	9	12	21	79	43	59	30	480	36	12	251	14	1046
5:00 PM	6	11	17	53	30	45	25	442	32	11	212	9	893

FEHR & PEERS ASSOCIATES, INC.
INTERSECTION TURNING MOVEMENT SUMMARY

INTERSECTION:	**N. Virginia/17th**	**TIME:**	**3:30 PM to 6:00 PM**
JURISDICTION:	**City of Reno**	**DATE:**	**2/27/2003**
PROJECT TITLE:		**PROJECT NO:**	

PEAK HOUR PERIOD: 4:30 PM to 5:30 PM
PEAK 15 MINUTE PERIOD: 5:15 PM to 5:30 PM



INTERSECTION PEAK HOUR FACTOR: 0.89

RUNNING COUNTS	N/A Eastbound Left	Thru	Right	17th Westbound Left	Thru	Right	N. Virginia Northbound Left	Thru	Right	N. Virginia Southbound Left	Thru	Right	
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
3:45 PM				8		3		169	7	10	117		314
4:00 PM				17		7		383	8	12	254		681
4:15 PM				24		14		587	14	16	342		997
4:30 PM				26		16		742	17	19	415		1235
4:45 PM				32		30		913	19	22	505		1521
5:00 PM				40		34		1094	21	29	604		1822
5:15 PM				54		44		1313	23	32	720		2186
5:30 PM				65		49		1551	27	35	830		2557
5:45 PM				72		54		1753	29	37	898		2843
6:00 PM				78		59		1889	31	39	959		3055

PERIOD COUNTS													
Period End	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
3:45 PM				8		3		169	7	10	117		314
4:00 PM				9		4		214	1	2	137		367
4:15 PM				7		7		204	6	4	88		316
4:30 PM				2		2		155	3	3	73		238
4:45 PM				6		14		171	2	3	90		286
5:00 PM				8		4		181	2	7	99		301
5:15 PM				14		10		219	2	3	116		364
5:30 PM				11		5		238	4	3	110		371
5:45 PM				7		5		202	2	2	68		286
6:00 PM				6		5		136	2	2	61		212

HOURLY TOTALS													
Beginning At	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**TOTAL**
3:30 PM				26		16		742	17	19	415		1235
3:45 PM				24		27		744	12	12	388		1207
4:00 PM				23		27		711	13	17	350		1141
4:15 PM				30		30		726	9	16	378		1189
4:30 PM				39		33		809	10	16	415		1322
4:45 PM				40		24		840	10	15	393		1322
5:00 PM				38		25		795	10	10	355		1233