

Smith's Commercial Development

(McMahon Blvd. / Golf Course Rd.)

Access Justification

—◆—
May 30, 2007

Terry O. Brown, P.E.

Presented to:

***Transportation Planning
City of Albuquerque
Municipal Development***

Developer:

**Brown Group, Inc.
8777 N. Gainey Center Dr. Ste. 200
Scottsdale, AZ 85258**



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Thursday, December 23, 2004

John Hartmann
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Proposed Driveway for Smiths (McMahon Blvd. West of Golf Course Rd.)

Dear John:

The Appendix of this Report contains supporting data to provide a basis upon which to determine if a right-turn-in, right-turn-out driveway located approximately 324 feet west from the centerline of said driveway to the centerline of the signalized intersection of McMahon Blvd. (Ellison Dr.) / Golf Course Rd. and also a full access driveway onto Golf Course Rd. is acceptable to the City of Albuquerque and to the Metropolitan Transportation Board (M.T.B.).

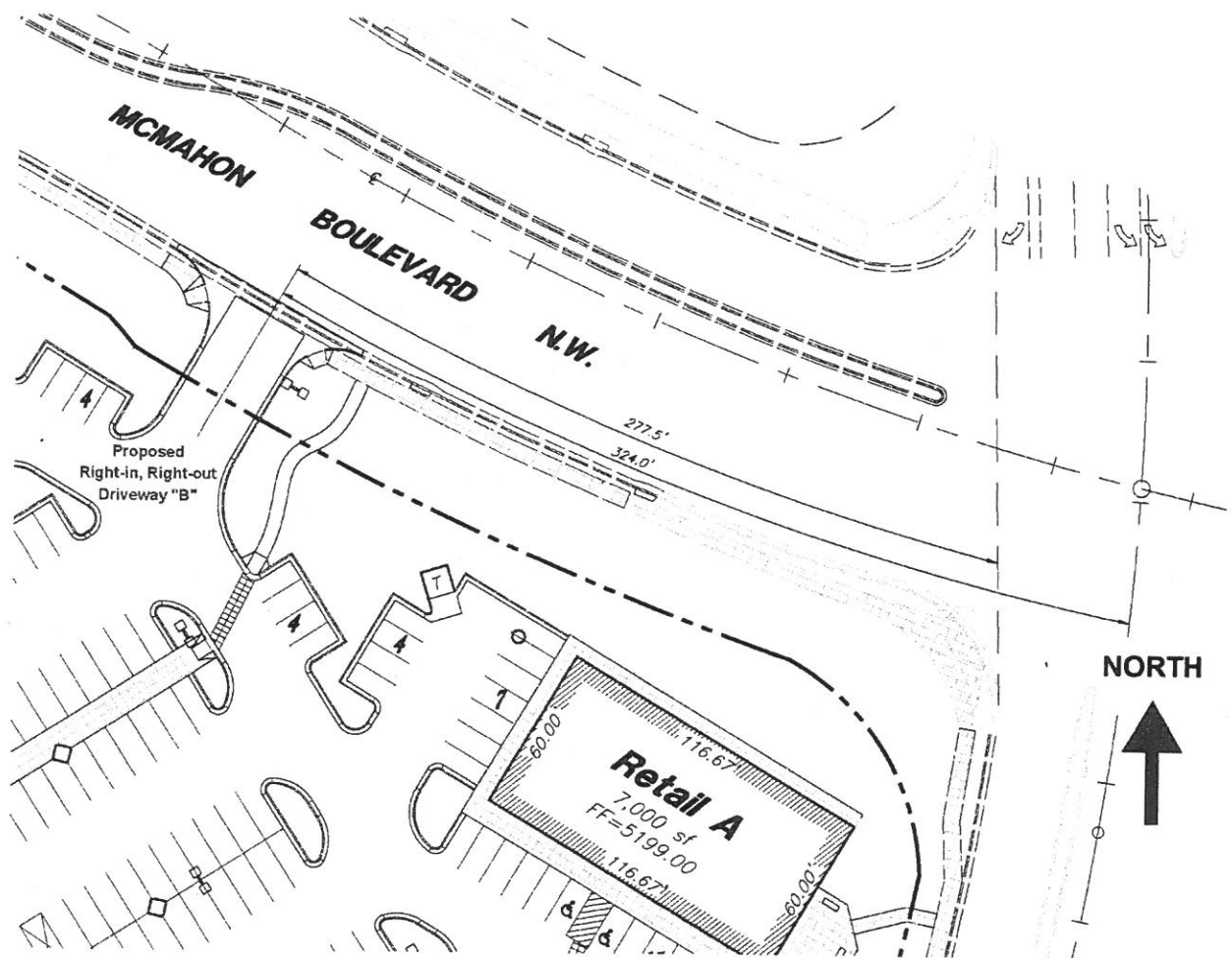
A Traffic Impact Study was performed for the Smith's Commercial Development (also called Golf Course Marketplace) in October, 2004. The Traffic Impact Study determined the projected BUILD Volumes for the implementation year for the project (2006). Those volumes were then utilized to analyze the signalized intersection of McMahon Blvd. / Golf Course Rd. (Ellison Dr.) and perform the queuing analysis for each turning movement at the intersection. Subsequently, the 2020 forecast volumes for the intersection of McMahon Blvd. / Golf Course Rd. were obtained from the Westside / McMahon Corridor Study (See Appendix). The new trips from the Smith's site were added to those volumes to obtain the 2020 BUILD Volumes and the queuing analysis for the 2020 AM and PM Peak Hour BUILD Analysis was performed utilizing those volumes. The results of the queuing analysis for the eastbound right turn lane on McMahon Blvd. at Golf Course Rd. are summarized in the following table:

Queuing Methodology	2006 AM BUILD	2006 PM BUILD	2020 AM BUILD	2020 PM BUILD
City of Albuquerque Std. Method (Poisson's Ratio)	188*	150*	300*	237*

* Adjusted queue length by $\frac{1}{2}$ to account for right turns on red and overlap phases.

Re: Proposed Driveway for Smiths (McMahon Blvd. West of Golf Course Rd.)

The centerline of the proposed right-turn-in, right-turn-out driveway for Smiths is approximately 277 feet west of the eastbound stop bar at the intersection of McMahon Blvd. / Golf Course Rd. The following drawing from the proposed site development plan demonstrates the configuration and the location of the proposed right-turn-in, right-turn-out driveway onto McMahon Blvd. west of Golf Course Rd.



Based upon the traffic projections, only in the last few years of said projection will the right-turn queuing distance extend to the proposed drive, and this only occurs during the peak AM hour when Smith's experiences minimal traffic volumes. During the PM Peak Hour the right turn queuing is not projected to extend to the driveway through the 2020 projections.

Re: Proposed Driveway for Smiths (McMahon Blvd. West of Golf Course Rd.)

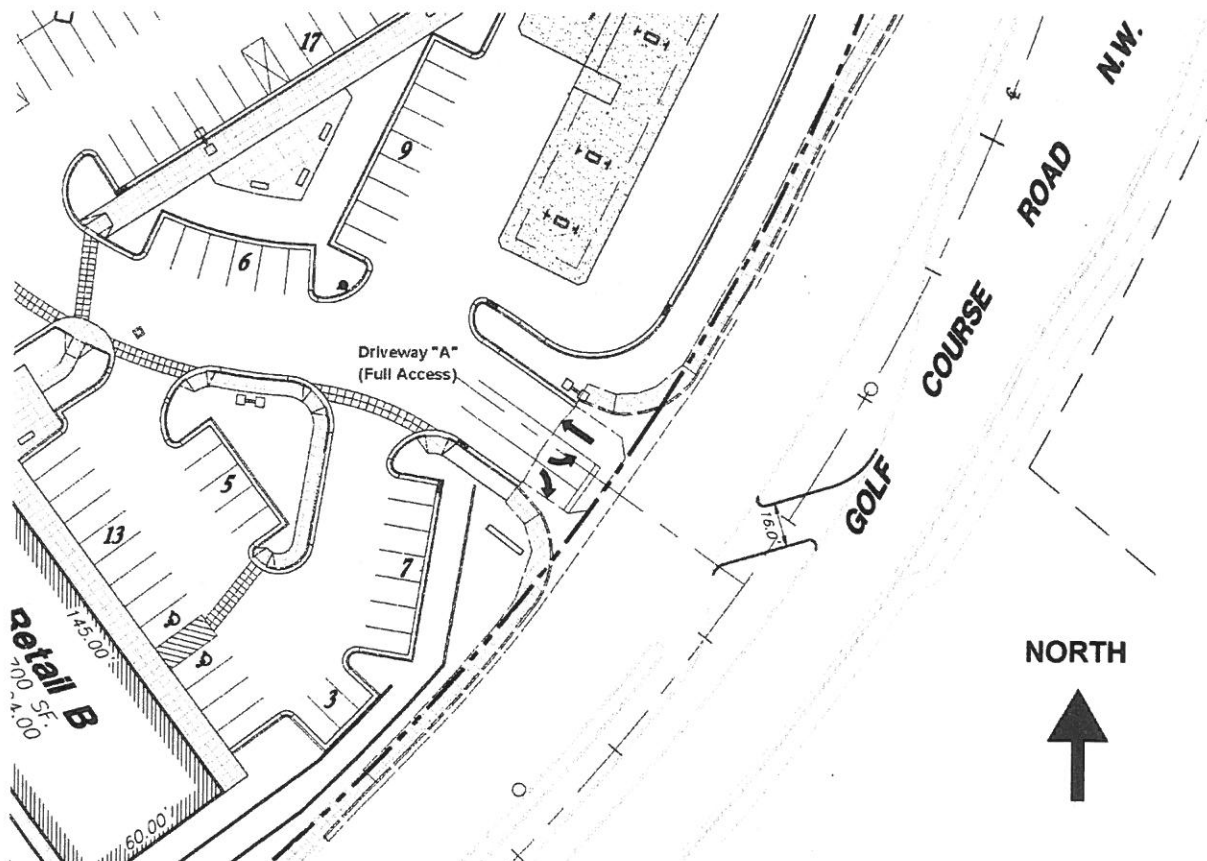
On behalf of the owner, I am requesting that you sponsor approval of the above described right-turn-in, right-turn-out driveway on the south side of McMahon Blvd. approximately 277 feet west of the west curblineline of Golf Course Rd. for approval by the Metropolitan Transportation Board (M.T.B.).

Also, I have provided an analysis of the proposed east driveway (Driveway "A") onto Golf Course Rd. as a full access driveway instead of the current right-turn-in, right-turn-out, left-turn-in driveway recently constructed by the Golf Course Rd. Improvement Project. The analysis of Driveway "A" is contained on Pages A-31 thru A-32 in the Appendix. One reason I think this option should be considered is that there is similar access on Golf Course Rd. at the existing Smith's site south of Paseo del Norte. The Smith's site at Paseo del Norte / Golf Course Rd. is a similar type of development for which access is prohibited to Paseo del Norte and there are two unsignalized access driveways onto Golf Course Rd. south of Paseo del Norte. Also, the volumes on Golf Course Rd. south of Paseo del Norte are similar to those on Golf Course Rd. south of McMahon (Ellison). One of the primary reasons that this concept works is because there is a wide median in the center of Golf Course Rd. that serves as a storage area for a vehicle making a staged left turns from the driveway onto northbound Golf Course Rd. This concept works well at Paseo del Norte / Golf Course Rd. even though the analysis would show that the delays at the intersection are excessive. The new median on Golf Course Rd. south of McMahon (Ellison) is approximately 27 feet wide at proposed Driveway "A".

The exiting left turn alternative from Driveway "A" onto northbound Golf Course Rd. may be helpful in permitting a right-turn-out from Driveway "B" onto eastbound McMahon Blvd. in that it would relieve some of the traffic desiring to turn right from Driveway "B" onto McMahon Blvd.

Another reason for this request is that the site access works better with the additional access than without it. This fact was stated by the Environmental Planning Commission on the record at the Environmental Planning Commission Meeting held November 18, 2004. There are proposed pad sites along the east side of the site on the approved site development plan. Traffic exiting those pad sites desiring to travel east on Ellison Dr. or north on Golf Course Rd. will need a more reasonable egress point than the one at the northwest corner of the site. If there are only two driveways accessing this project as currently designed and built by the City of Albuquerque (one full access onto McMahon Blvd. at the northwest corner of the site and a right-turn-in, right-turn-out, left-turn-in only driveway onto Golf Course Rd. at the east end of the site), then there would only be one egress point from the site for exiting traffic desiring to travel east on Ellison Dr. or north on Golf Course Dr. That driveway would be the proposed full access driveway on McMahon Blvd. at the northwest corner of the site (or Driveway "C"). Customers of Retail Pad "A", Retail Pad "B", and the fueling center would be required to travel across parking areas and pedestrian crossing areas in order to move from those establishments to access Driveway "C" at the northwest corner of the site. This access concept poses safety problems on the site by requiring an excessive number of vehicles to travel across pedestrian crossing areas in front of the proposed Smith's Food Store to access Driveway "C". Permitting left turns out of Driveway "A" will reduce the frequency at which those vehicles would be required to exit via Driveway "C" to travel east on Ellison Dr. or north on Golf Course Dr. Additionally, permitting Driveway "B" and allowing right-turn-in, right-turn-out movements at the north end of the site just to the west of Retail Pad "A" will also reduce the number of vehicles that will be required to travel this unsafe path. Following is a drawing showing the proposed left-turn median cut for Driveway "A".

Re: Proposed Driveway for Smiths (McMahon Blvd. West of Golf Course Rd.)



Re: Proposed Driveway for Smiths (McMahon Blvd. West of Golf Course Rd.)

Therefore, this request is to approve a right-turn-in, right-turn-out driveway at proposed Driveway "B" and approve a full access at Driveway "A" onto Golf Course Rd. The approval of the right-turn-in, right-turn-out access at Driveway "B" will require that you sponsor the new access point for M.T.B. approval.

Attached in the Appendix of this report are the following supporting documents:

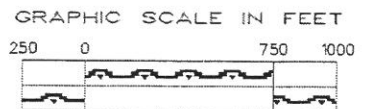
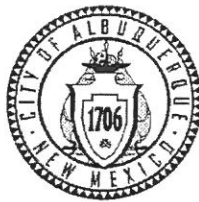
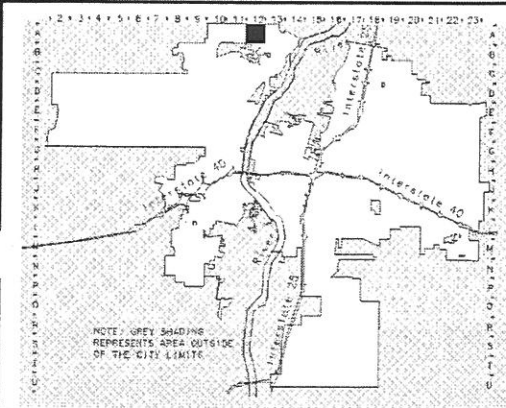
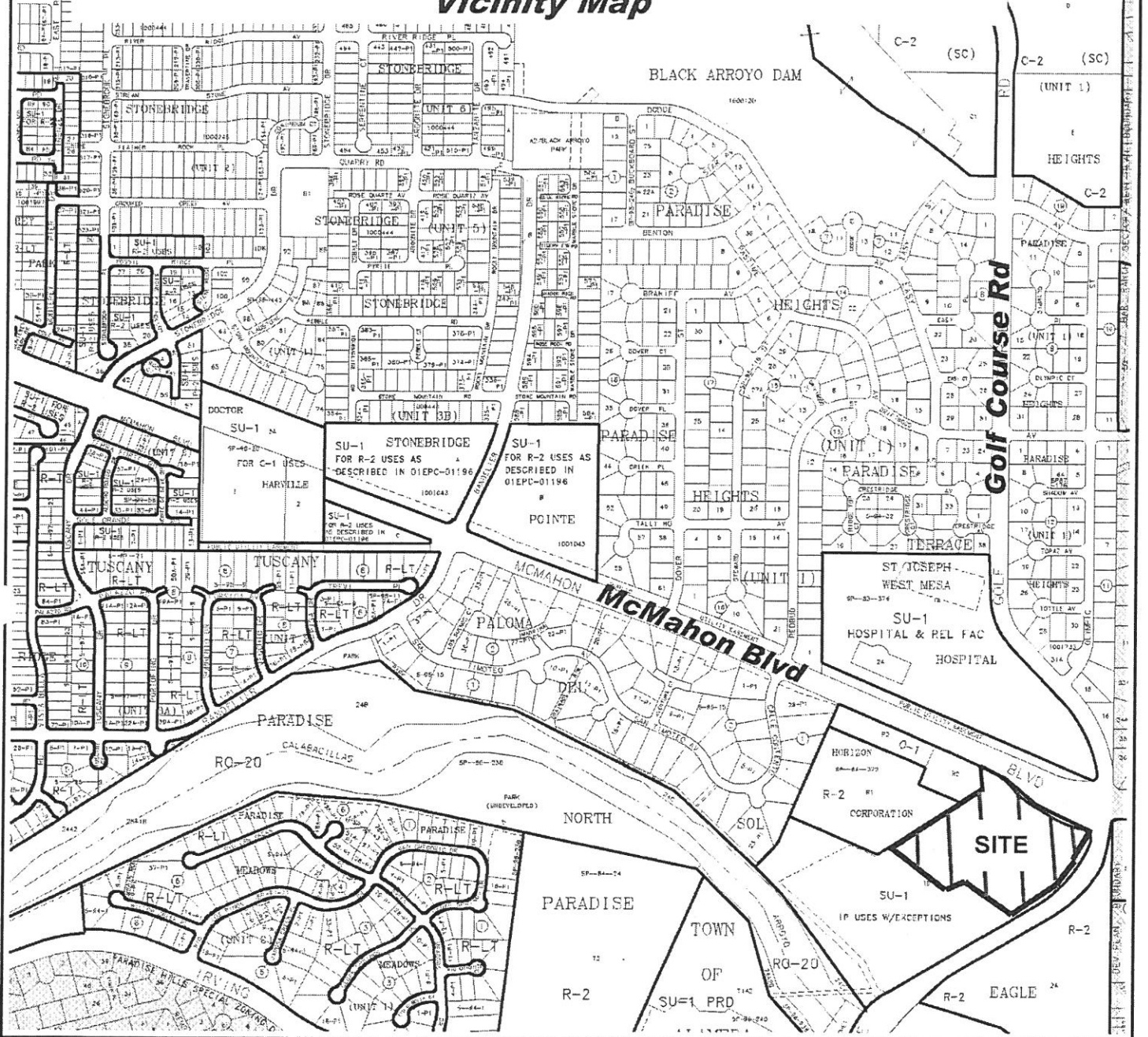
Page A-1	- Vicinity Map
Page A-2	- Proposed Site Development Plan for the Smith's Commercial Development
Page A-3	- 2006 Forecast Volumes Turning Movements Worksheet
Page A-4	- Diagrams of 2006 NO BUILD, Trips Generated, and 2006 BUILD Volumes
Page A-5	- 2006 Queuing Analysis Summary Report - City of Albuquerque Methodology (Poisson's Ratio)
Page A-6 to A-14	- 2006 Signal Analysis Summary Report (TEAPAC Methodologies)
Page A-15	- 2020 Forecast Volumes Turning Movements Worksheet
Page A-16	- Diagrams of 2020 NO BUILD, Trips Generated, and 2020 BUILD Volumes
Page A-17	- 2020 Queuing Analysis Summary Report (City of Albuquerque Methodology (Poisson's Ratio)
Page A-18 to A-21	- 2020 Queuing Analysis Summary Report (TEAPAC Methodologies)
Page A-22 to A-30	- Portion of Westside / McMahon Corridor Study
Page A-31 to A-32	- Analysis of left turn out at Driveway "A"

Please call if you have questions or need additional information.

Sincerely Yours,

Terry O. Brown

Smith's - Golf Course Rd | McMahon Blvd Vicinity Map



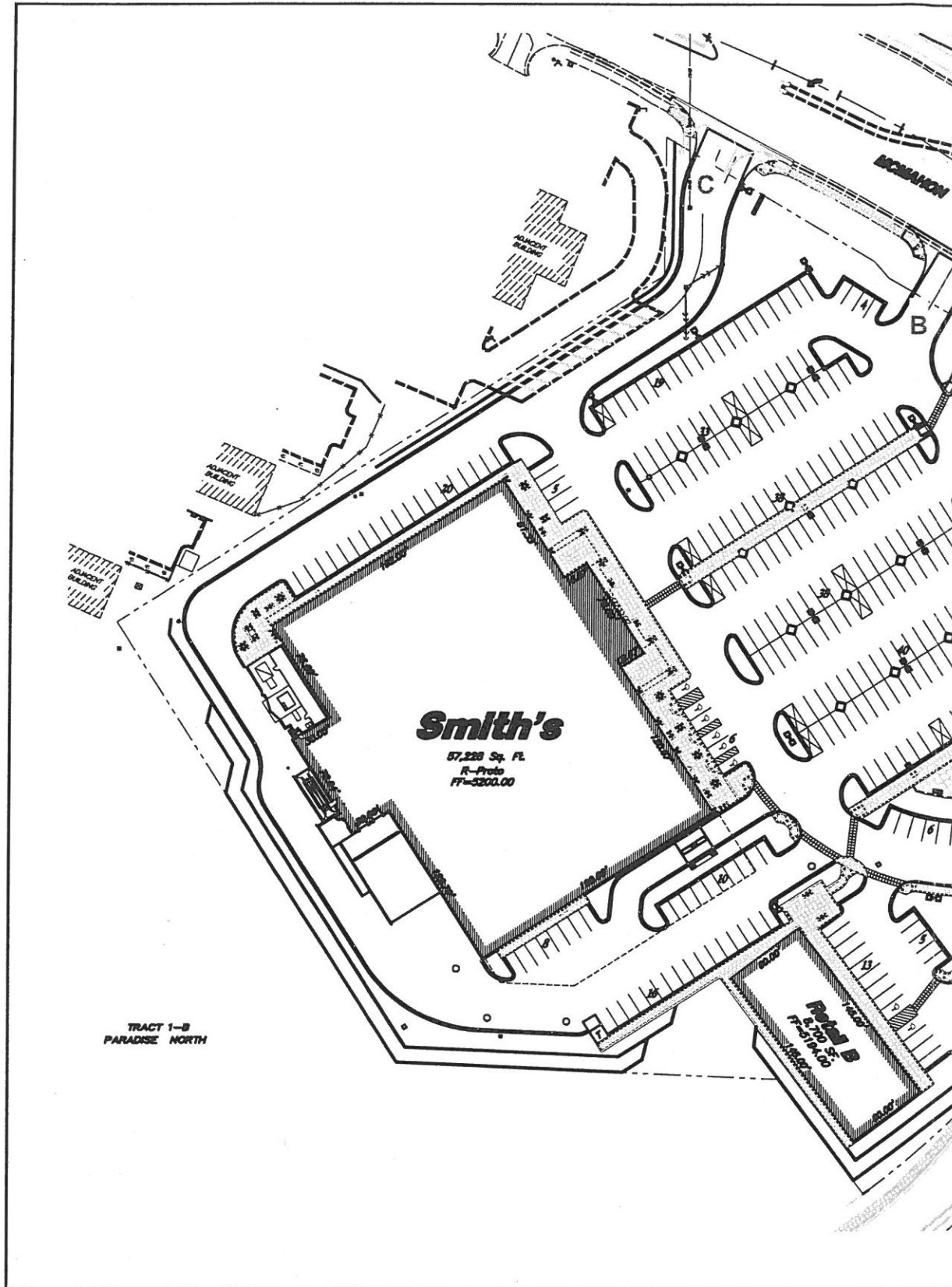
Albuquerque **G**eographic **I**nformation **S**ystem
PLANNING DEPARTMENT

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Zone Atlas Page

A-12-Z

Map Amended through September 01, 2004



TRACT 1-B
PARADISE NORTH

Smith's (McMahon Blvd / Golf Course Rd)
Projected Turning Movements Worksheet
McMahon Blvd / Golf Course Rd

INTERSECTION:

E-W Street: McMahon Blvd
N-S Street: Golf Course Rd

(4)

Year of Existing Counts 2001
Implementation Year 2006

Growth Rates

	3.00%			5.60%			5.30%			3.00%		
	Eastbound (McMahon Blvd)			Westbound (McMahon Blvd)			Northbound (Golf Course Rd)			Southbound (Golf Course Rd)		
Existing Volumes	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Background Traffic Growth	43	461	248	163	124	34	78	260	655	120	529	22
Subtotal	6	69	37	46	35	10	21	69	174	18	79	3
Paradise Hts / Anasazi Ridge	49	530	285	209	159	44	99	329	829	138	608	25
Cabezon Dev.	40	40	40	0	13	0	13	0	0	0	0	13
	20	0	0	0	0	40	0	200	0	40	415	30
Subtotal (NO BUILD - A.M.)	109	570	325	209	172	84	112	529	829	178	1,023	68
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	23.50%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	12.64%	0.00%
Percent Commercial Trips Generated(Exiting)	12.64%	29.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	19	45	0	46	11	0	0	0	0	0	25	0
Total AM Peak Hour BUILD Volumes	128	615	325	255	183	84	112	529	829	178	1,048	68

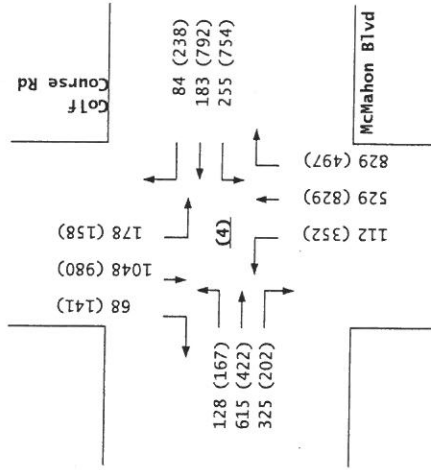
Existing Volumes	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Background Traffic Growth	66	272	155	530	573	139	247	521	393	94	369	53
Subtotal	10	41	23	148	160	39	65	138	104	14	55	8
Paradise Hts / Anasazi Ridge	76	313	178	678	733	178	312	659	497	108	424	61
Cabezon Dev.	24	24	24	0	40	0	40	0	0	0	0	40
	30	0	0	0	0	60	0	170	0	50	515	40
Subtotal (NO BUILD - P.M.)	130	337	202	678	773	238	352	829	497	158	939	141
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	23.50%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	12.64%	0.00%
Percent Commercial Trips Generated(Exiting)	12.64%	29.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	37	85	0	76	19	0	0	0	0	0	41	0
Total PM Peak Hour BUILD Volumes	167	422	202	754	792	238	352	829	497	158	980	141

Number of Commercial Trips Generated

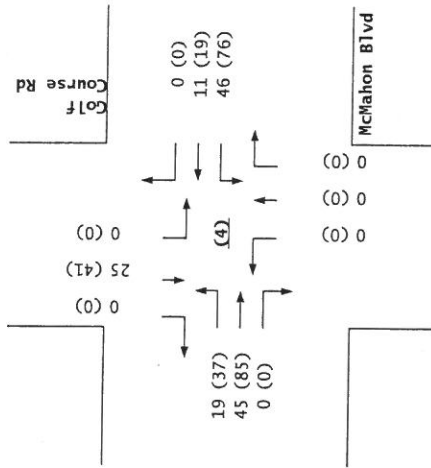
Entering 195
Exiting 325

100% Commercial Development
A.M. 153
P.M. 290

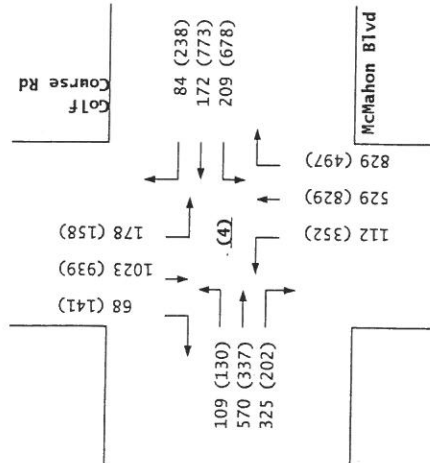
2006
BUILD



Trips



2006
NO BUILD



McMahon Blvd / Golf Course Rd

Queueing Analysis Summary Sheet

Project:

Smith's (McMahon Blvd / Golf Course Rd)

Intersection:

McMahon Blvd / Golf Course Rd (Projected 2006 Volumes)

Eastbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	1	43	250				2	461	N/A	1	248	400
AM NO BUILD Queue	1	109	175				2	570	375	1	325	375
AM BUILD Queue	1	128	175				2	615	400	1	325	375
Existing Lane Length	1	66	250				2	272	N/A	1	155	400
PM NO BUILD Queue	1	130	200				2	337	275	1	202	300
PM BUILD Queue	1	167	250				2	422	325	1	202	300

Westbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	2	163	300				2	124	N/A	1	34	225
AM NO BUILD Queue	2	209	175				2	172	150	1	84	125
AM BUILD Queue	2	255	200				2	183	150	1	84	125
Existing Lane Length	2	530	300				2	573	N/A	1	139	225
PM NO BUILD Queue	2	678	500				2	773	550	1	238	350
PM BUILD Queue	2	754	550				2	792	575	1	238	350

Northbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	2	78	250				2	260	N/A	1	655	200
AM NO BUILD Queue	2	112	100				2	529	350	1	829	850
AM BUILD Queue	2	112	100				2	529	350	1	829	850
Existing Lane Length	2	247	250				2	521	N/A	1	393	200
PM NO BUILD Queue	2	352	300				2	829	575	1	497	625
PM BUILD Queue	2	352	300				2	829	575	1	497	625

Southbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	2	120	200				2	529	N/A	1	22	125
AM NO BUILD Queue	2	178	150				2	1,023	600	1	68	125
AM BUILD Queue	2	178	150				2	1,048	625	1	68	125
Existing Lane Length	2	94	200				2	369	N/A	1	53	125
PM NO BUILD Queue	2	158	150				2	939	650	1	141	225
PM BUILD Queue	2	158	150				2	980	675	1	141	225

AM
PM
 Cycle Length: 110 130

The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

11/06/04
10:24:43

Intersection # 1 -

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Key:  VOLUMES -- >
      |  WIDTHS
      v      LANES
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North

	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Heavy veh, %HV	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Pk-hr fact, PHF	.81	.81	.81	.72	.70	.71	.87	.87	.87	.76	.76	.76
Pretimed or Act	A	A	A	A	A	A	A	A	A	A	A	A
Strtup lost, ll	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext eff grn, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival typ, AT	3	3	3	3	3	3	3	3	3	3	3	3
Ped vol, vped		0			0			0			0	
Bike vol, vbic		0			0			0			0	
Parking locatns		NO			NO			NO			NO	
Park mnvrs, Nm		0			0			0			0	
Bus stops, NB		0			0			0			0	
Grade, %G		.0			.0			.0			.0	

A - 6

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_06ABX]
 2006 AM Peak BUILD Conditions

11/06/04
 10:24:43

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Volume Adjust & Satflow Worksheet

Volume Adjustment	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Volume, V	68	1048	178	84	183	255	829	529	112	325	615	128
Pk-hr fact, PHF	.81	.81	.81	.72	.70	.71	.87	.87	.87	.76	.76	.76
Adj mv flow, vp	84	1294	220	117	261	359	953	608	129	428	809	168
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj LG flow, v	84	1294	220	117	261	359	953	608	129	428	809	168
Prop LT, PLT	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00
Prop RT, PRT	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000

Saturation Flow Rate	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Base satflo, so	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Number lanes, N	1	2	2	1	2	2	1	2	2	1	2	1
Lane width, fw	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Heavy veh, fhv	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970
Grade, fg	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Parking, fp	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Bus block, fbb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Area type, fa	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Lane util, fLU	1.000	.950	.970	1.000	.950	.970	1.000	.950	.970	1.000	.950	1.00
Left-turn, fLT	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.452
Right-turn, fRT	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00
PedBike LT, fLpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
PedBike RT, fRpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Local adjustmnt	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Adj satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	833
Prot LT fLT										.000	.000	.950
Prot LT Satflo										0	0	1751

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_06ABX]
 2006 AM Peak BUILD Conditions

11/06/04
 10:24:43

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Capacity and LOS Worksheet

Capacity Analysis	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	84	1294	220	117	261	359	953	608	129	428	809	168
Satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	1751
Lost time, tL	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Effect green, g	61.9	44.5	8.1	38.1	25.0	12.4	61.9	44.5	8.1	38.1	25.0	12.4
Grn ratio, g/C	.563	.405	.073	.346	.227	.113	.563	.405	.073	.346	.227	.113
LG capacity, c	882	1417	250	542	796	383	882	1417	250	542	796	197
v/c ratio, X	.095	.913	.880	.216	.328	.937	1.080	.429	.516	.790	1.02	.853
Flow ratio, v/s	.054	.370	.065	.075	.075	.106	.608	.174	.038	.273	.231	.096
Crit lane group			*				*				*	
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Permitted Phases of Compound Left Turns												
Adj Flow, v												0
Satflow, s												833
Lost time, tL												.0
Effect green, g												30.0
Grn ratio, g/C												.273
LG capacity, c												227
v/c ratio, X												.000
Flow ratio, v/s												.000
Crit lane group												
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sum crit v/s, Yc	0.904			Total lost, L			15.0					
Crit v/c, Xc	1.047											
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Delay and LOS	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	84	1294	220	117	261	359	953	608	129	428	809	168
LG capacity, c	882	1417	250	542	796	383	882	1417	250	542	796	424
v/c ratio, X	.095	.913	.880	.216	.328	.937	1.080	.429	.516	.790	1.02	.396
Grn ratio, g/C	.563	.405	.073	.346	.227	.113	.563	.405	.073	.346	.227	.385
Unif delay, d1	11.1	30.9	50.5	25.4	35.5	48.4	24.0	23.6	49.1	32.4	42.5	23.2
Incr calib, k	.11	.43	.41	.11	.11	.45	.50	.11	.12	.34	.50	.11
Incr delay, d2	.0	9.3	28.2	.2	.2	30.5	54.4	.2	1.9	7.7	36.0	.6
Queue Delay, d3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Unif delay, d1*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Prog factor, PF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Contrl delay, d	11.1	40.2	78.7	25.6	35.7	78.9	78.5	23.8	50.9	40.1	78.5	23.9
Lane group LOS	B+	D+	E	C+	D+	E	E	C+	D	D+	E	C+
Final Queue, Qbi	0	0	0	0	0	0	18	0	0	0	3	0
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Appr delay, dA	44.0			55.1			56.7			60.3		
Approach LOS	D+			E+			E+			E+		
Appr flow, vA	1598			737			1690			1405		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Intersection:	Delay	53.7		LOS		D						
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_06PBX]
 2006 PM Peak BUILD Conditions

11/06/04
 10:25:57

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Input Worksheet

Intersection # 1 -

Area Location Type: NONCBD

						Key: VOLUMES -- >		
						WIDTHS		
						v LANES		

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_06PBX]
 2006 PM Peak BUILD Conditions

11/06/04
 10:25:57

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Volume Adjust & Satflow Worksheet

Volume Adjustment	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Volume, V	141	980	158	238	792	754	497	829	352	202	422	167
Pk-hr fact, PHF	.84	.84	.84	.89	.89	.89	.90	.90	.90	.92	.92	.92
Adj mv flow, vp	168	1167	188	267	890	847	552	921	391	220	459	182
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj LG flow, v	168	1167	188	267	890	847	552	921	391	220	459	182
Prop LT, PLT	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00
Prop RT, PRT	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000

Saturation Flow Rate	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Base satflo, so	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Number lanes, N	1	2	2	1	2	2	1	2	2	1	2	1
Lane width, fw	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Heavy veh, fHV	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970
Grade, fg	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Parking, fp	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Bus block, fbb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Area type, fa	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Lane util, fLU	1.000	.950	.970	1.000	.950	.970	1.000	.950	.970	1.000	.950	1.00
Left-turn, fLT	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.248
Right-turn, fRT	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00
PedBike LT, fLpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
PedBike RT, fRpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Local adjustmnt	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Adj satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	456
Prot LT fLT										.000	.000	.950
Prot LT Satflo										0	0	1751

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_06PBX]
 2006 PM Peak BUILD Conditions

11/06/04
 10:25:57

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Capacity and LOS Worksheet

Capacity Analysis	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	168	1167	188	267	890	847	552	921	391	220	459	141
Satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	1751
Lost time, tL	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Effect green, g	57.8	42.3	16.5	62.2	40.7	32.7	80.0	42.3	16.5	40.0	18.5	10.4
Grn ratio, g/C	.444	.326	.127	.479	.313	.251	.615	.326	.127	.308	.142	.080
LG capacity, c	696	1140	432	750	1097	854	964	1140	432	482	497	141
v/c ratio, X	.241	1.02	.435	.356	.811	.992	.573	.808	.905	.456	.924	1.00
Flow ratio, v/s	.107	.333	.055	.170	.254	.249	.352	.263	.115	.140	.131	.081
Crit lane group	*			*			*			*		

Permitted Phases of Compound Left Turns

Adj Flow, v	41											
Satflow, s	456											
Lost time, tL	5.0											
Effect green, g	18.5											
Grn ratio, g/C	.142											
LG capacity, c	65											
v/c ratio, X	.631											
Flow ratio, v/s	.090											
Crit lane group												
Sum crit v/s, Yc	0.829			Total lost, L			20.0					
Crit v/c, Xc	.980											

Delay and LOS	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	168	1167	188	267	890	847	552	921	391	220	459	182
LG capacity, c	696	1140	432	750	1097	854	964	1140	432	482	497	206
v/c ratio, X	.241	1.02	.435	.356	.811	.992	.573	.808	.905	.456	.924	.883
Grn ratio, g/C	.444	.326	.127	.479	.313	.251	.615	.326	.127	.308	.142	.222
Unif delay, d1	22.5	43.8	52.4	21.3	41.1	48.5	14.8	40.1	56.0	36.2	55.1	44.6
Incr calib, k	.11	.50	.11	.11	.35	.49	.17	.35	.43	.11	.44	.41
Incr delay, d2	.2	32.8	.7	.3	4.7	28.7	.8	4.4	22.3	.7	23.1	33.2
Queue Delay, d3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Unif delay, d1*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Prog factor, PF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Contrl delay, d	22.7	76.7	53.1	21.6	45.8	77.2	15.7	44.5	78.2	36.9	78.1	77.8
Lane group LOS	C+	E	D	C+	D	E	B	D+	E	D+	E	E
Final Queue, Qbi	0	7	0	0	0	0	0	0	0	0	0	0

Appr delay, dA	67.8	55.9	43.1	67.5
Approach LOS	E	E+	D+	E
Appr flow, vA	1523	2004	1864	861
Intersection:	Delay	56.6	LOS	E+

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_06PBX]
 2006 PM Peak BUILD Conditions

11/06/04
 10:25:57

SIGNAL2000/TEAPAC[Ver 2.02.16] - Queuemodel Calculations

Intersection # 1 -

Sq 45 LD/LD	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
.	+ ^	+ *	+	^	^
/ \	+ +++++	+ *	+	++++	++++
	+>	<+ *	<+	<++++	<++++
		v	^	****	^
North	<*	+ +>	+>	+>	++++>
	++++ *	+ +	+	+	++++
	v *	+ +	+	+	v

C=130"	G/C=0.127 G= 16.5" Y+R= 5.0"	G/C=0.326 G= 42.3" Y+R= 5.0"	G/C=0.080 G= 10.4" Y+R= 5.0"	G/C=0.133 G= 17.2" Y+R= 5.0"	G/C=0.142 G= 18.5" Y+R= 5.0"

QUEUES F L % Veh					SB Approach			WB Approach			NB Approach			EB Approach		
Veh/Ln	m	n	tl	Len	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
1 HCM	B	W	90	25/40	7	45	6	11	28	32	21	29	15	12	18	13
3 ARRB	B	W	95	25/40	8	37	6	12	24	26	21	24	13	13	15	14
4 HCM	B	W	50	25/40	4	30	3	6	18	21	13	18	9	7	11	8
6 MBQ	B	A	50	25/40	4	21	3	6	15	15	12	15	7	6	8	6
7 97E+	L	A	90	25/40	5	22	4	7	14	15	10	15	8	8	10	7
8 97A+	L	A	90	25/40	5	18	4	7	14	15	10	15	8	8	10	7
9 97E	L	A	90	25/40	7	31	6	10	22	23	15	22	12	11	14	10
10 97A	L	A	90	25/40	7	28	6	10	22	23	15	22	12	11	14	10
Selected Model # 1					7	45	6	11	28	32	21	29	15	12	18	13

QUEUES F L % Veh					SB Approach			WB Approach			NB Approach			EB Approach		
Ft/Lan	m	n	tl	Len	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
1 HCM	B	W	90	25/40	176	1141	155	278	711	818	530	728	383	294	457	340
3 ARRB	B	W	95	25/40	200	945	160	305	603	657	542	619	329	319	384	360
4 HCM	B	W	50	25/40	102	766	89	164	455	531	330	466	232	175	280	204
6 MBQ	B	A	50	25/40	96	543	80	154	377	388	301	388	177	163	208	162
7 97E+	L	A	90	25/40	127	560	102	178	357	382	255	382	204	204	255	178
8 97A+	L	A	90	25/40	127	458	102	178	357	382	255	382	204	204	255	178
9 97E	L	A	90	25/40	172	793	151	256	562	583	390	571	314	280	362	260
10 97A	L	A	90	25/40	172	724	151	256	562	583	390	571	314	280	362	260
Selected Model # 1					176	1141	155	278	711	818	530	728	383	294	457	340
Available Storage					0	0	0	0	0	0	0	0	0	0	0	0
Queue Storage Ratio					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Smith's (McMahon Blvd / Golf Course Rd)
Projected Turning Movements Worksheet
McMahon Blvd / Golf Course Rd

INTERSECTION : McMahon Blvd (4)
E-W Street: McMahon Blvd
N-S Street: Golf Course Rd
Year of Existing Counts 2020
Horizon Year 2020

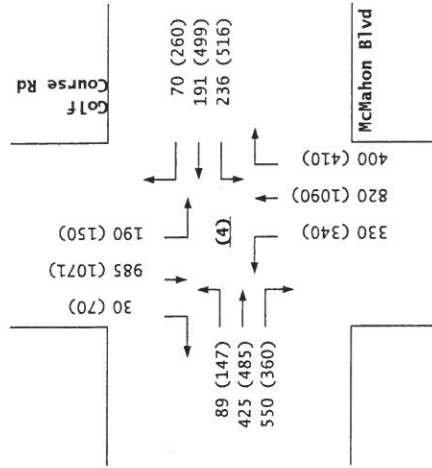
Growth Rates

	3.00%			5.50%			5.30%			3.00%		
	Eastbound (McMahon Blvd)			Westbound (McMahon Blvd)			Northbound (Golf Course Rd)			Southbound (Golf Course Rd)		
Existing Volumes	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Background Traffic Growth	70	380	550	190	180	70	330	820	400	190	960	30
	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal (NO BUILD - A.M.)	70	380	550	190	180	70	330	820	400	190	960	30
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	23.50%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	12.64%	0.00%
Percent Commercial Trips Generated(Exiting)	12.64%	29.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	19	45	0	46	11	0	0	0	0	0	25	0
Total AM Peak Hour BUILD Volumes	89	425	550	236	191	70	330	820	400	190	985	30

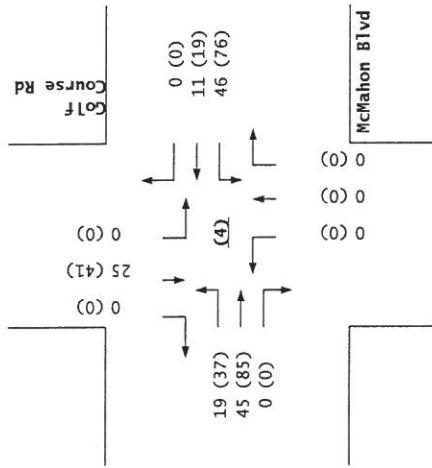
	Eastbound (McMahon Blvd)			Westbound (McMahon Blvd)			Northbound (Golf Course Rd)			Southbound (Golf Course Rd)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	110	400	360	440	480	260	340	1,090	410	150	1,030	70
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal (NO BUILD - P.M.)	110	400	360	440	480	260	340	1,090	410	150	1,030	70
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	23.50%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	12.64%	0.00%
Percent Commercial Trips Generated(Exiting)	12.64%	29.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	37	85	0	76	19	0	0	0	0	0	41	0
Total PM Peak Hour BUILD Volumes	147	485	360	516	499	260	340	1,090	410	150	1,071	70

Number of Commercial Trips Generated
 Entering 195
 Exiting 153
 325 A.M.
 290 P.M.
 100% Commercial Development

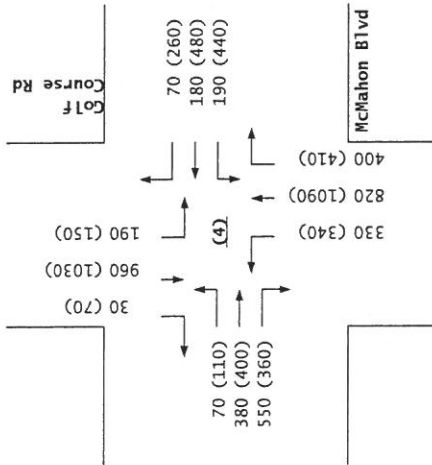
2020
BUILD



Trips



2020
NO BUILD



McMahon Blvd / Golf Course Rd

Queueing Analysis Summary Sheet

Project:

Smith's (McMahon Blvd / Golf Course Rd)

Intersection:

McMahon Blvd / Golf Course Rd (Projected 2020 Volumes)

Eastbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	1	70	250				2	380	N/A	1	550	400
AM NO BUILD Queue	1	70	125				2	380	275	1	550	600
AM BUILD Queue	1	89	150				2	425	300	1	550	600
Existing Lane Length	1	110	250				2	400	N/A	1	360	400
PM NO BUILD Queue	1	110	175				2	400	325	1	360	475
PM BUILD Queue	1	147	225				2	485	375	1	360	475
Westbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	2	190	300				2	180	N/A	1	70	225
AM NO BUILD Queue	2	190	150				2	180	150	1	70	125
AM BUILD Queue	2	236	175				2	191	150	1	70	125
Existing Lane Length	2	440	300				2	480	N/A	1	260	225
PM NO BUILD Queue	2	440	350				2	480	375	1	260	375
PM BUILD Queue	2	516	400				2	499	375	1	260	375
Northbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	2	330	250				2	820	N/A	1	400	200
AM NO BUILD Queue	2	330	250				2	820	500	1	400	450
AM BUILD Queue	2	330	250				2	820	500	1	400	450
Existing Lane Length	2	340	250				2	1,090	N/A	1	410	200
PM NO BUILD Queue	2	340	275				2	1,090	750	1	410	525
PM BUILD Queue	2	340	275				2	1,090	750	1	410	525
Southbound				Left Turns			Thru Movements			Right Turns		
Approach	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)	# Lanes	Vol.	Length (Ft.)
Existing Lane Length	2	190	200				2	960	N/A	1	30	125
AM NO BUILD Queue	2	190	150				2	960	575	1	30	75
AM BUILD Queue	2	190	150				2	985	600	1	30	75
Existing Lane Length	2	150	200				2	1,030	N/A	1	70	125
PM NO BUILD Queue	2	150	150				2	1,030	700	1	70	125
PM BUILD Queue	2	150	150				2	1,071	725	1	70	125

AM **PM**
 Cycle Length: 110 130

NOTE: The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Input Worksheet

Intersection # 1 -

Area Location Type: NONCBD

						Key: VOLUMES -- >	
						WIDTHS	
						v LANES	

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_20ABX]
 2020 AM Peak BUILD Conditions

11/06/04
 11:07:58

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Volume Adjust & Satflow Worksheet

Volume Adjustment	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Volume, V	330	985	190	70	191	236	400	820	330	550	425	90
Pk-hr fact, PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85
Adj mv flow, vp	388	1159	224	82	225	278	471	965	388	647	500	106
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj LG flow, v	388	1159	224	82	225	278	471	965	388	647	500	106
Prop LT, PLT	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00
Prop RT, PRT	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000

Saturation Flow Rate	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Base satflo, so	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Number lanes, N	1	2	2	1	2	2	1	2	2	1	2	1
Lane width, fw	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Heavy veh, fhv	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970
Grade, fg	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Parking, fp	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Bus block, fbb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Area type, fa	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Lane util, fLU	1.000	.950	.970	1.000	.950	.970	1.000	.950	.970	1.000	.950	1.00
Left-turn, fLT	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.499
Right-turn, fRT	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00
PedBike LT, fLpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
PedBike RT, fRpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Local adjustmnt	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Adj satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	919
Prot LT fLT										.000	.000	.950
Prot LT Satflo										0	0	1751

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_20ABX]
 2020 AM Peak BUILD Conditions

11/06/04
 11:07:58

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Capacity and LOS Worksheet

Capacity Analysis	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	388	1159	224	82	225	278	471	965	388	647	500	106
Satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	1751
Lost time, tL	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Effect green, g	53.3	36.9	14.9	46.7	26.8	11.4	53.3	36.9	14.9	46.7	26.8	11.4
Grn ratio, g/C	.484	.336	.136	.425	.244	.103	.484	.336	.136	.425	.244	.103
LG capacity, c	759	1175	461	665	853	351	759	1175	461	665	853	181
v/c ratio, X	.511	.986	.486	.123	.264	.792	.621	.821	.842	.973	.586	.586
Flow ratio, v/s	.248	.331	.066	.052	.064	.082	.301	.276	.114	.413	.143	.061
Crit lane group	*			*						*		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Permitted Phases of Compound Left Turns

Adj Flow, v												0
Satflow, s												919
Lost time, tL												.0
Effect green, g												31.8
Grn ratio, g/C												.289
LG capacity, c												266
v/c ratio, X												.000
Flow ratio, v/s												.000
Crit lane group												
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sum crit v/s, Yc	0.826			Total lost, L			15.0					
Crit v/c, Xc	.956											
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

Delay and LOS	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	388	1159	224	82	225	278	471	965	388	647	500	106
LG capacity, c	759	1175	461	665	853	351	759	1175	461	665	853	447
v/c ratio, X	.511	.986	.486	.123	.264	.792	.621	.821	.842	.973	.586	.237
Grn ratio, g/C	.484	.336	.136	.425	.244	.103	.484	.336	.136	.425	.244	.392
Unif delay, d1	19.4	36.3	44.0	19.2	33.6	48.2	20.9	33.5	46.4	31.0	36.7	21.8
Incr calib, k	.12	.49	.11	.11	.11	.34	.20	.36	.38	.48	.18	.11
Incr delay, d2	.6	22.9	.8	.1	.2	11.7	1.6	4.8	13.2	28.1	1.1	.3
Queue Delay, d3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Unif delay, d1*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Prog factor, PF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Contrl delay, d	20.0	59.2	44.8	19.3	33.8	59.9	22.5	38.3	59.6	59.2	37.8	22.1
Lane group LOS	C+	E+	D+	B	C	E+	C+	D+	E+	E+	D+	C+
Final Queue, Qbi	0	0	0	0	0	0	0	0	0	0	0	0
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Appr delay, dA	48.8			44.2			38.7			47.5		
Approach LOS	D			D+			D+			D		
Appr flow, vA	1771			585			1824			1253		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Intersection:	Delay	44.6		LOS	D+							
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====

11/06/04
11:09:28

Intersection # 1 -

```
Key:  VOLUMES -- >
      |  WIDTHS
      v    LANES
```

North

	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Heavy veh, %HV	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Pk-hr fact, PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85
Pretimed or Act	A	A	A	A	A	A	A	A	A	A	A	A
Strtup lost, ll	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ext eff grn, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival typ, AT	3	3	3	3	3	3	3	3	3	3	3	3
Ped vol, vped		0			0			0			0	
Bike vol, vbic		0			0			0			0	
Parking locatns		NO			NO			NO			NO	
Park mnvrs, Nm		0			0			0			0	
Bus stops, NB		0			0			0			0	
Grade, %G		.0			.0			.0			.0	

C=130"	G= 16.8"	G= 46.0"	G= 24.3"	G= 22.9"	G= 0.0"	G= 0.0"
	Y+R= 5.0"	Y+R= 5.0"	Y+R= 5.0"	Y+R= 5.0"	Y+R= 0.0"	Y+R= 0.0"

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_20PBX]
 2020 PM Peak BUILD Conditions

11/06/04
 11:09:28

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Volume Adjust & Satflow Worksheet

Volume Adjustment	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Volume, V	70	1071	150	260	499	516	410	1090	340	360	485	150
Pk-hr fact, PHF	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85
Adj mv flow, vp	82	1260	176	306	587	607	482	1282	400	424	571	176
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj LG flow, v	82	1260	176	306	587	607	482	1282	400	424	571	176
Prop LT, PLT	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00	.000	.000	1.00
Prop RT, PRT	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000	1.000	.000	.000

Saturation Flow Rate	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Base satflo, so	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Number lanes, N	1	2	2	1	2	2	1	2	2	1	2	1
Lane width, fw	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Heavy veh, fhv	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970
Grade, fg	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Parking, fp	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Bus block, fbb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Area type, fa	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Lane util, fLU	1.000	.950	.970	1.000	.950	.970	1.000	.950	.970	1.000	.950	1.00
Left-turn, fLT	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.950	1.000	1.00	.143
Right-turn, fRT	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00	.850	1.00	1.00
PedBike LT, fLpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
PedBike RT, fRpb	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Local adjustmnt	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00	1.000	1.00	1.00
Adj satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	264
Prot LT fLT										.000	.000	.950
Prot LT Satflo										0	0	1751

Smith's (McMahon Blvd / Golf Course Rd)
 Analysis of McMahon Blvd / Golf Course Rd - [4_20PBX]
 2020 PM Peak BUILD Conditions

11/06/04
 11:09:28

SIGNAL2000/TEAPAC[Ver 2.02.16] - HCM Capacity and LOS Worksheet

Capacity Analysis	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	82	1260	176	306	587	607	482	1282	400	424	571	176
Satflow, s	1566	3501	3396	1566	3501	3396	1566	3501	3396	1566	3501	1751
Lost time, tL	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Effect green, g	75.3	46.0	16.8	44.7	22.9	24.3	75.3	46.0	16.8	44.7	22.9	24.3
Grn ratio, g/C	.579	.354	.130	.344	.176	.187	.579	.354	.130	.344	.176	.187
LG capacity, c	907	1239	440	539	617	634	907	1239	440	539	617	327
v/c ratio, X	.090	1.02	.400	.568	.951	.957	.531	1.03	.909	.787	.925	.538
Flow ratio, v/s	.052	.360	.052	.195	.168	.179	.308	.366	.118	.271	.163	.101
Crit lane group					*	*		*	*			

Permitted Phases of Compound Left Turns

Adj Flow, v												0
Satflow, s												264
Lost time, tL												.0
Effect green, g												27.9
Grn ratio, g/C												.215
LG capacity, c												57
v/c ratio, X												.000
Flow ratio, v/s												.000
Crit lane group												
Sum crit v/s, Yc	0.830			Total lost, L			20.0					
Crit v/c, Xc	.981											

Delay and LOS	SB			WB			NB			EB		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Lane group, LG	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Adj Flow, v	82	1260	176	306	587	607	482	1282	400	424	571	176
LG capacity, c	907	1239	440	539	617	634	907	1239	440	539	617	384
v/c ratio, X	.090	1.02	.400	.568	.951	.957	.531	1.03	.909	.787	.925	.458
Grn ratio, g/C	.579	.354	.130	.344	.176	.187	.579	.354	.130	.344	.176	.401
Unif delay, d1	12.2	42.0	51.9	34.7	53.0	52.4	16.6	42.0	55.8	38.3	52.7	28.1
Incr calib, k	.11	.50	.11	.16	.46	.47	.13	.50	.43	.33	.44	.11
Incr delay, d2	.0	29.9	.6	1.4	24.8	25.5	.6	35.0	22.6	7.6	20.0	.9
Queue Delay, d3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Unif delay, d1*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Prog factor, PF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Contrl delay, d	12.2	71.9	52.5	36.2	77.8	77.9	17.3	77.0	78.4	45.9	72.7	29.0
Lane group LOS	B+	E	D	D+	E	E	B	E	E	D	E	C
Final Queue, Qbi	0	5	0	0	0	0	0	11	0	0	0	0
Appr delay, dA	66.4			69.3			63.9			56.5		
Approach LOS	E+			E			E+			E+		
Appr flow, vA	1518			1500			2164			1171		
Intersection:	Delay	64.4		LOS	E+							

Westside/McMahon Corridor Study

TPU-7601(7), CN 9823

Traffic Analysis Report

Prepared for:

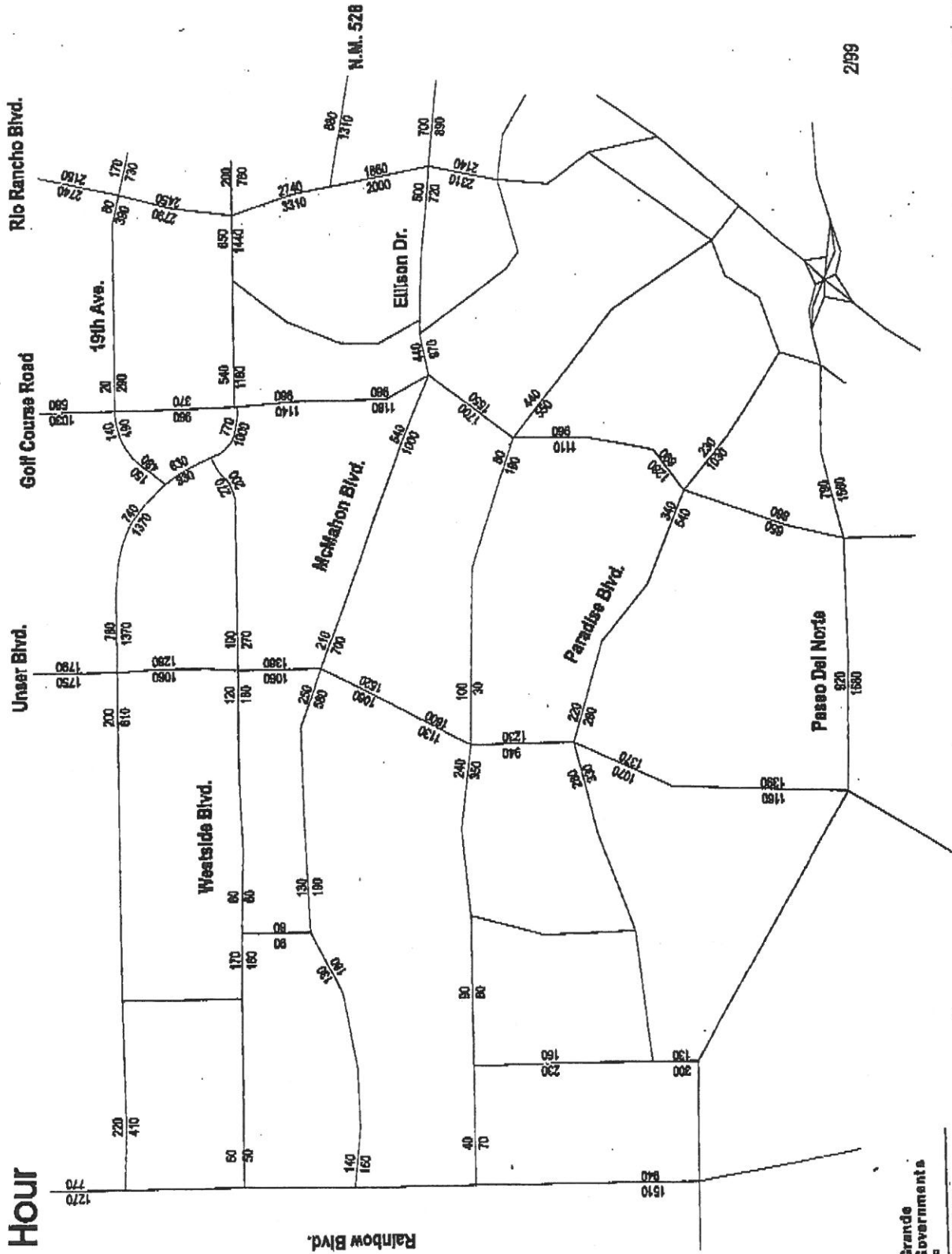
Parsons Brinckerhoff Quade & Douglas, Inc.

Prepared by:

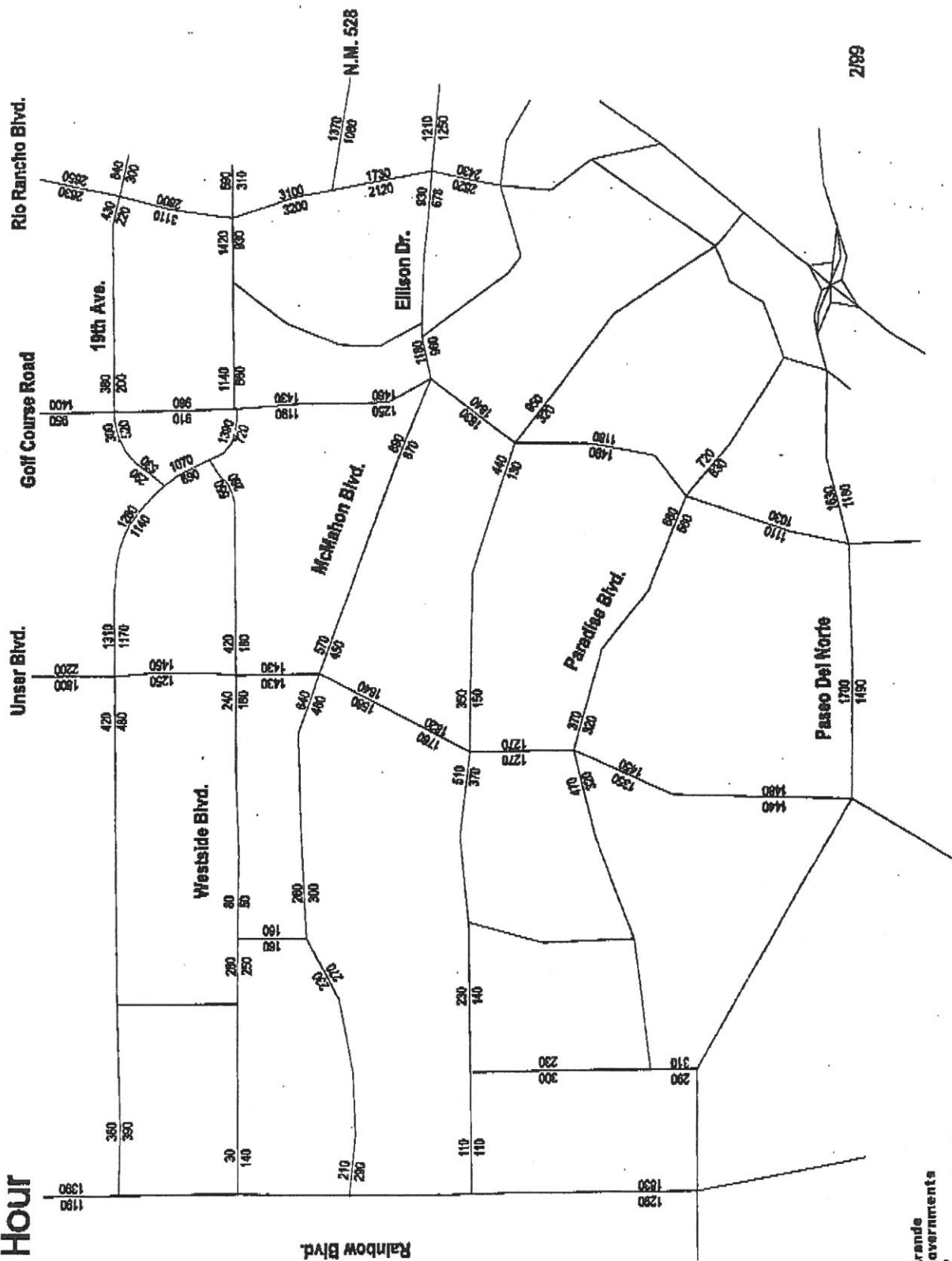
TRANSCORE

April 1999
Revised August 1999

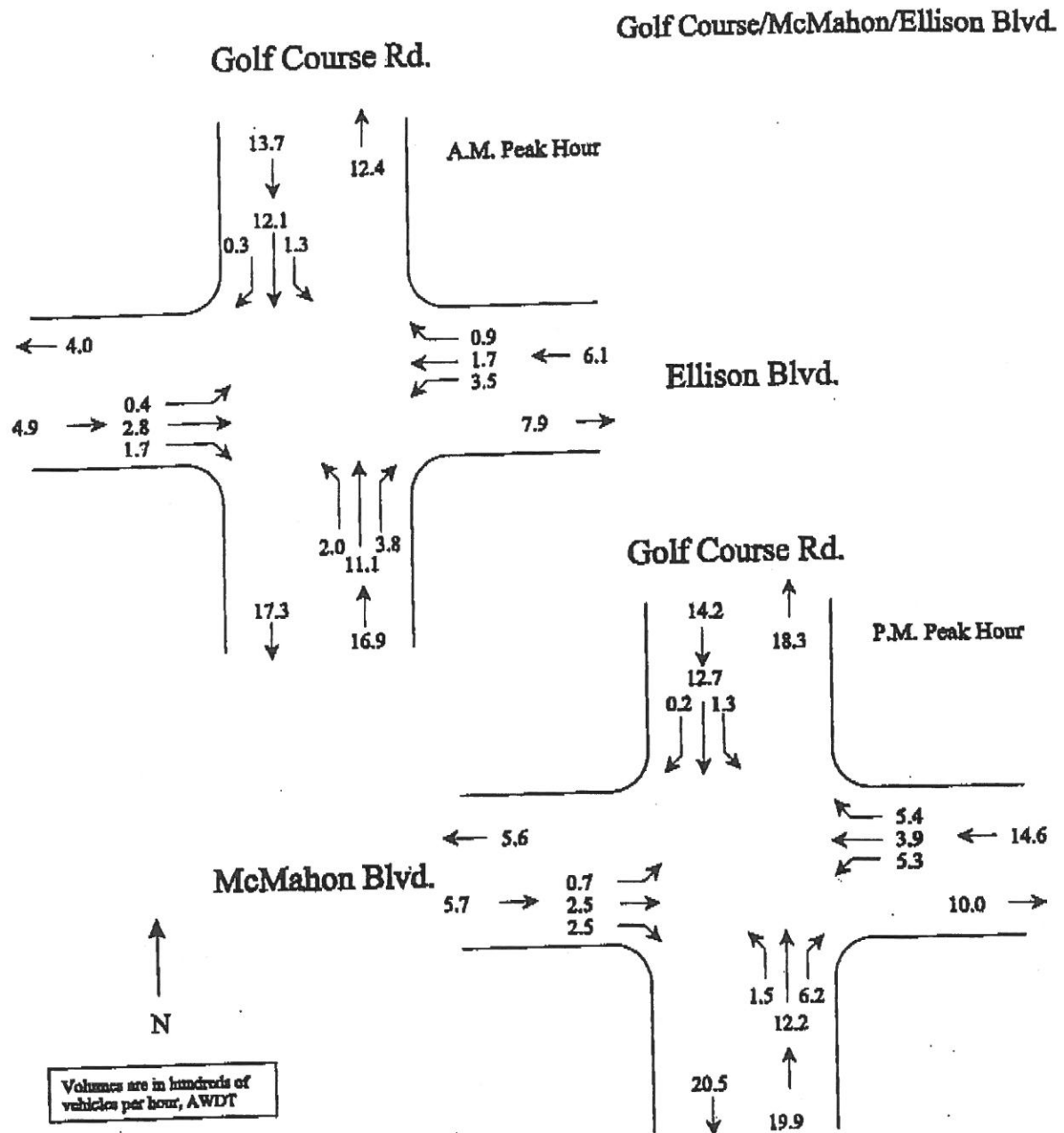
Westside / McMahon Study Year 2020 Build 2 Alternative AM Peak Hour



**Westside / McMahon Study
Year 2020
Build 2 Alternative
PM Peak Hour**



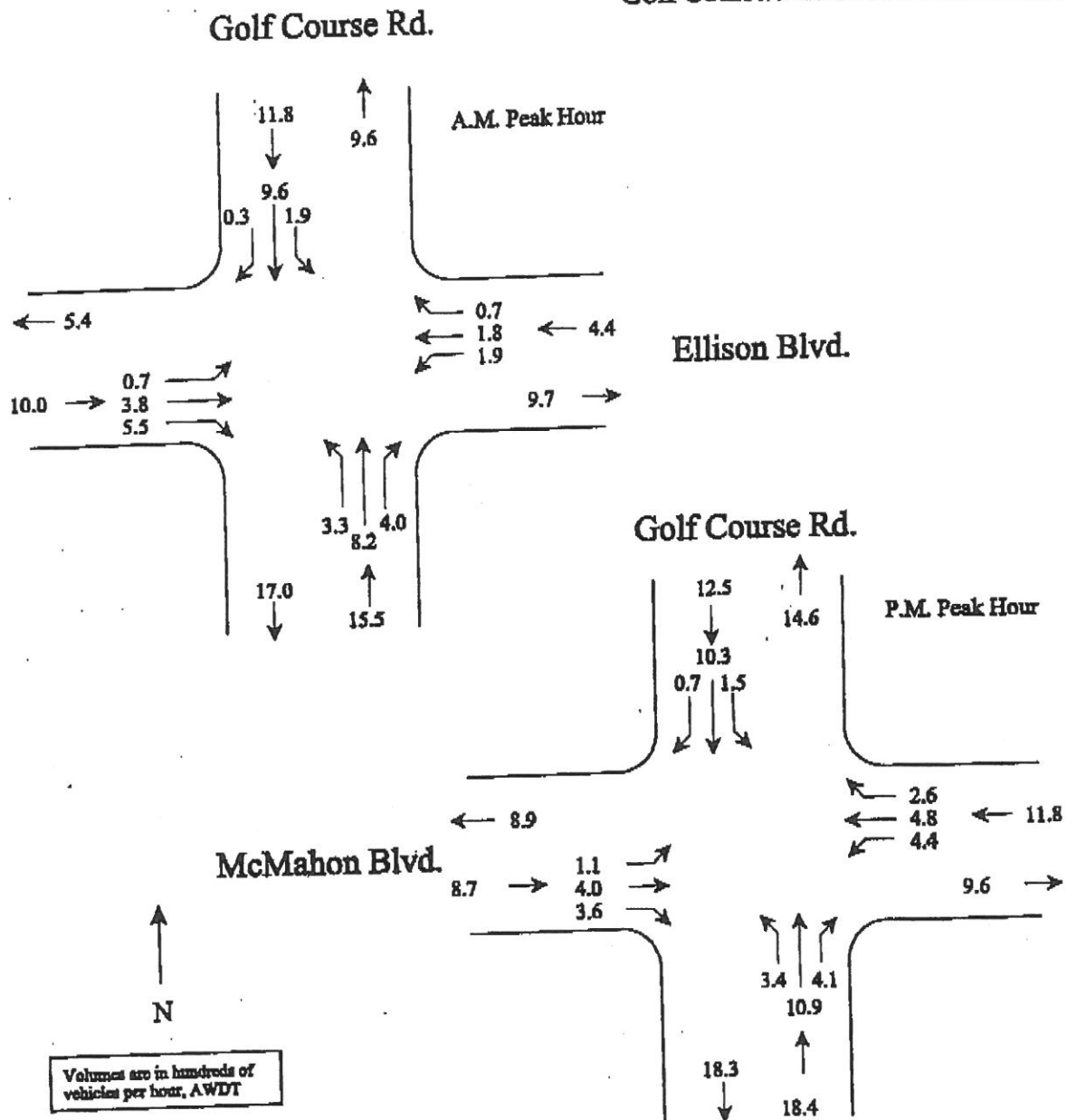
Year 2020 AM and PM Peak Hour Volumes
Westside/Mc Mahon Blvd. Corridor Study
No Build Alternative



3/99

Year 2020 AM and PM Peak Hour Volumes
 Westside/Mc Mahon Blvd. Corridor Study
 Build 2 Alternative

Golf Course/McMahon/Ellison Blvd.



3/99

HCS-Signals 3.1a File:gcmmanbp

HCS: Signals Release 3.1a

Inter: Golf Course @ McMahon
 Analyst: JEH
 Date: 4/9/99
 E/W St: McMahon Blvd

City/St: Albuquerque, NM
 Proj #: 2592-030
 Period: No Build AM Peak Ped Timing
 N/S St: Golf Course Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	1	1	2	1	1	2	0
LGConfig	L	T	R	L	T	R	L	T	R	L	TR	
Volume	40	280	170	350	170	90	200	1110	380	130	1210	30
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			8			0			20			0

Duration 1.00 Area Type: All other areas
 Signal Operations

Signal Operations				5	6	7	8		
Phase Combination		1	2	3	4				
EB	Left		P			NB	Left	P	P
	Thru		P				Thru	P	P
	Right		P				Right	P	P
	Peds		X				Ped	X	X
WB	Left	P	P			SB	Left	P	P
	Thru	P	P				Thru		P
	Right	P	P				Right		P
	Peds	X	X				Ped		X
NB	Right	P				EB	Right	P	P
SB	Right					WB	Right	P	
Green		19.0	26.5					6.5	0.5
Yellow		3.0	3.0					3.0	3.0
All Red		0.5	1.0					0.5	1.0
Cycle Length:		110.0	secs						

Intersection Performance Summary

Intersection Performance Summary								
Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
Eastbound								
L	277	1195	0.16	0.232	34.9	C		
T	434	1872	0.72	0.232	49.2	D	40.4	D
R	576	1585	0.31	0.364	26.5	C		
Westbound								
L	415		0.94	0.436	70.6	E		
T	813	1863	0.23	0.436	20.1	C	48.1	D
R	840	1579	0.12	0.532	13.2	B		
Northbound								
L	229		0.97	0.473	79.1	E		
T	1351	3539	0.86	0.382	31.3	C	32.0	C
R	933	1579	0.43	0.591	7.8	A		
Southbound								
L	157		0.92	0.395	68.4	E		
TR	1217	3524	1.07	0.345	173.7	F	163.2	F

Intersection Delay = 78.2 (sec/veh) Intersection LOS = E

HCS-Signals 3.1a File:gcmmpnbp

Page 1

HCS: Signals Release 3.1a

Inter: Golf Course @ McMahon
 Analyst: JEH
 Date: 4/9/99
 E/W St: McMahon Blvd

City/St: Albuquerque, NM
 Proj #: 2592-030
 Period: No Build PM Peak Ped Timing
 N/S St: Golf Course Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	1	1	2	1	1	2	0
LG Config	L	T	R	L	T	R	L	T	R	L	TR	
Volume	70	250	250	530	390	540	150	1220	620	130	1270	20
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
RTOR Vol			12			0			31			0

Duration		1.00	Area Type: All other areas									
			Signal Operations									
Phase Combination		1	2	3	4		5	6	7	8		
EB	Left		P			NB	Left	P		P		
	Thru		P				Thru			P		
	Right		P				Right			P		
	Peds		X				Ped			X		
EB	Left	P	P			SB	Left	P		P		
	Thru	P	P				Thru			P		
	Right	P	P				Right			P		
	Peds	X	X				Ped			X		
	Right	P				EB	Right	P				
SB	Right					WB	Right	P				
Green		22.5	26.5					8.0		48.0		
Yellow		3.0	3.0					3.0		3.0		
All Red		0.5	1.0					0.5		1.0		
Cycle Length:		120.0	secs									
Performance Summary												

Intersection Performance Summary

Intersection Performance Summary								
Oppr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
Eastbound								
	207	976	0.38	0.213	45.7	D		
	398	1872	0.66	0.213	52.0	D	45.0	D
	496	1587	0.51	0.313	37.4	D		
Westbound								
	450		1.24	0.429	488.8	F		
	800	1863	0.51	0.429	27.5	C	194.1	F
R	836	1579	0.68	0.529	25.3	C		
Northbound								
	173		0.97	0.488	66.9	E		
	1386	3539	0.93	0.392	36.4	D	30.7	C
R	963	1572	0.64	0.613	9.2	A		
Southbound								
	173		0.83	0.488	35.9	D		
TR	1382	3529	0.98	0.392	48.4	D	47.2	D

Intersection Delay = 80.6 (sec/veh) Intersection LOS = F

HCS-Signals 3.1a File:gcmmaab2p

Page 1

HCS: Signals Release 3.1a

Inter: Golf Course @ McMahon
 Analyst: JEH
 Date: 4/9/99
 E/W St: McMahon Blvd

City/St: Albuquerque, NM
 Proj #: 2592-030
 Period: Build 2 AM Peak Ped Timing
 N/S St: Golf Course Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	2	2	0	2	2	1	1	2	0
LGConfig	L	T	R	L	TR		L	T	R	L	TR	
Volume	70	380	550	190	180	70	330	820	400	190	960	30
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			22			0			20			0

Duration 1.00 Area Type: All other areas

Duration		1.00		Area type: All other areas		Signal Operations											
Phase Combination		1	2	3	4			5	6	7	8						
EB	Left	P		P		NB	Left	P									
	Thru			P			Thru			P							
	Right			P			Right			P							
	Peds			X			Ped			X							
WB	Left	P	P			SB	Left	P		P							
	Thru		P	P			Thru			P							
	Right		P	P			Right			P							
	Peds		X	X			Ped			X							
NB	Right	P	P			EB	Right	P									
SB	Right					WB	Right										
Green		6.0	1.0	31.0				14.0		39.5							
Yellow		3.0	3.0	3.0				3.0		3.0							
All Red		0.5	0.5	1.0				0.5		1.0							
Cycle Length:		110.0	secs														

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
Eastbound								
L	378		0.21	0.318	28.0	C		
T	970	3557	0.44	0.273	34.4	C	35.4	D
R	692	1585	0.80	0.436	37.2	D		
Westbound								
L	296	3433	0.71	0.086	63.6	E		
TR	1056	3367	0.26	0.314	28.9	C	43.8	D
Northbound								
L	406	3433	0.85	0.118	60.2	E		
T	1239	3539	0.70	0.350	30.0	C	33.1	C
R	761	1579	0.55	0.482	16.9	B		
Southbound								
L	332		0.64	0.509	16.8	B		
TR	1232	3520	0.85	0.350	33.7	C	30.8	C

Intersection Delay = 34.2 (sec/veh) Intersection LOS = C

HCS-Signals 3.1a File:gcmmpb2p

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HCS: Signals Release 3.1a

Inter: Golf Course @ McMahon
 Analyst: JEH
 Date: 4/9/99
 E/W St: McMahon Blvd

City/St: Albuquerque, NM
 Proj #: 2592-030
 Period: Build 2 PM Peak Ped Timing
 N/S St: Golf Course Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	2	2	0	2	2	1	1	2	0
LG Config	L	T	R	L	TR		L	T	R	L	TR	
Volume	110	400	360	440	480	260	340	1090	410	150	1030	70
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
TOR Vol			18			0			20			0

Duration 1.00 Area Type: All other areas
 Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	P		P		P	P	P	
Thru			P			P	P	
Right			P			P	P	
Peds			X			X	X	
EB Left	P	P	P		P		P	
Thru		P	P				P	
Right		P	P				P	
Peds		X	X				X	
EB Right	P	P			P	P		
SB Right								
Green	6.0	9.5	31.0		9.0	2.0	40.5	
Yellow	3.0	3.0	3.0		3.0	3.0	3.0	
All Red	0.5	0.5	1.0		0.5	0.5	1.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Intersection Performance Summary								
Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
Eastbound								
LB	216		0.56	0.292	48.0	D		
	889	3557	0.47	0.250	40.1	D	37.6	D
	641	1587	0.56	0.404	31.1	C		
Westbound								
LB	515	3433	0.90	0.150	77.2	E		
TR	1191	3323	0.65	0.358	35.1	D	50.8	D
Northbound								
LB	386	3433	0.93	0.112	74.7	E		
TR	1327	3539	0.86	0.375	34.6	C	36.9	D
R	891	1572	0.46	0.567	10.4	B		
Southbound								
LB	180		0.93	0.396	57.5	E		
TR	1151	3498	1.01	0.329	78.4	E	75.8	E

Intersection Delay = 49.8 (sec/veh) Intersection LOS = D

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst Nancy
 Agency or Company Terry
 Analysis Period/Year AM Peak 2006
 Comment 2006 AM Peak BUILD Conditon

Site Information

Jurisdiction/Date COA 11/19/2004
 Major Street Golf Course Rd
 Minor Street Drive 'A'

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R						R		
Lane 2	T			T						L		
Lane 3	L			T								
Lane 4												
Lane 5												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	154	1403			1576	138				64		123
PHF	0.90	0.95			0.95	0.90				0.90		0.90
Percent of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	171	1477			1659	153				71		137
Flare storage (# of vehs)												
Median storage (# of vehs)										1		
Signal upstream of Movement 2	2000			Movement 5			500					
Length of study period (h)	0.25											

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1								
	2								
	3								
EB	1	R	137	311	0.440	2	25.3	D	97.3 F
	2	L	71	67	1.067	5	236.1	F	
	3								
NB	①		171	331	0.517	3	27.0	D	
SB	④								

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst Nancy
 Agency or Company Terry
 Analysis Period/Year PM Peak 2006
 Comment 2006 PM Peak BUILD Conditon

Site Information

Jurisdiction/Date COA 11/19/2004
 Major Street Golf Course Rd
 Minor Street Drive 'A'

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R						R		
Lane 2	T			T						L		
Lane 3	L			T								
Lane 4												
Lane 5												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	190	1636			1824	165				94		175
PHF	0.90	0.95			0.95	0.90				0.90		0.90
Percent of heavy vehicles, HV	0	3			3	3				3		3
Flow rate	211	1722			1920	183				104		194
Flare storage (# of vehs)												
Median storage (# of vehs)										1		
Signal upstream of Movement 2	2000			Movement 5			500					
Length of study period (h)	0.25											

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1								
	2								
	3								
EB	1	R	194	255	0.761	6	53.2	F	540.8 F
	2	L	104	29	3.596	13	1450.3	F	
	3								
NB	①		211	265	0.797	6	56.3	F	
SB	④								