

Starbuck's
(Solar / 4th St.)

Queuing Analysis / Traffic Analysis

—◆—
June 1, 2007

Terry O. Brown, P.E.

Presented to:

***Transportation Development Division
City of Albuquerque***

Developers:

**SCM Property Company, LLC
10400 West 18th Ave.
Lakewood, CO 80215**



Terry O. Brown

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Wednesday, December 07, 2005

Tony Loyd

City of Albuquerque Transportation Development Section
600 2nd St. NW
Albuquerque, NM 87102

Re: Queuing Analysis for Proposed Starbuck's (Solar Rd. / 4th St.)

Dear Tony:

Attached is the queuing analysis that you requested for the referenced project for your review and comment. The queuing analysis evaluates three conditions or cases as follows:

Case "1" – No access on Solar Rd. and full access on 4th St.

Case "2" – Full access driveway on Solar Rd. and right-in, right-out driveway on 4th St.

Case "3" – Full access driveway on Solar Rd. and full access driveway on 4th St.

There is a fourth case that you had mentioned consisting of a single right-in, right-out access to 4th St. There would be no evaluation of that scenario since a right-in, right-out driveway on 4th St. would present no queuing on public right-of-way. It would only queue within the site. Also, it would create a demand for U-Turns south of the site on 4th St.

The methodology utilized for the queuing analysis is summarized as follows:

- Determine the trip generation rates for the AM and PM Peak Hour of Adjacent Street Traffic for this project based on ITE Trip Generation Manual (7th Edition, 2003) data.
- Trips generated by the new project were distributed over the adjacent transportation system based on a population gravity model utilizing Mid-Region Council of Governments' Socioeconomic Data (*2025 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico (S-03-01)*).
- Trip Assignments were made based on the results of the Trip Distribution model utilizing logical routing of the new trips based on the constraints for each Case analyzed.
- For each those models (Cases), a signalized and unsignalized intersection analysis was performed to project the delays and queues at the existing signalized intersection of Solar Rd. / 4th St. as well as the proposed driveways for the project.

For the signalized intersection of Solar Rd. / 4th St., the level-of-service for all of the BUILD Conditions and Cases analyzed was LOS "C". There was very little variation in the analysis of the signalized intersections for the various cases. Some of the movements were at LOS "D", but the overall intersection was at LOS "C" in every Case for both the AM and PM Peak Hour analyses. In no instance was a turning movement projected to experience less than LOS "D" for either the AM Peak Hour or the PM Peak Hour.

Re: Queuing Analysis for Proposed Starbuck's (Solar Rd. / 4th St.)

The primary variation in operation of the access was in the delays and queues projected at the proposed Driveway "A" / 4th St. The proposed Driveway "B" on Solar Rd. operated at LOS "A" for all conditions and cases analyzed in this study. The following tables summarize the results of the analysis of each of the two proposed driveways for this project:

UNISIGNALIZED INTERSECTION ANALYSIS

Driveway "A" / 4th St.	CASE 1		CASE 2		CASE 3	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Minor Street (Driveway "A")						
EB Left	D – 28.8	F – 130	N/A	N/A	C – 21.9	F – 64.3
EB Right	D – 28.8	F – 130	A – 9.8	B – 10.4	C – 21.9	F – 64.3
Major Street (4th St.)						
NB Left	A – 2.2	A – 3.1	N/A	N/A	A – 1.2	A – 1.6
EB Queue (HCM) – Ft.	29	90	2	2	10	31

UNISIGNALIZED INTERSECTION ANALYSIS

Solar Rd / Driveway "B"	CASE 1		CASE 2		CASE 3	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Minor Street (Driveway "A")						
NB Left	N/A	N/A	A – 9.1	A – 9.3	A – 9.1	A – 9.3
NB Right	N/A	N/A	A – 9.1	A – 9.3	A – 9.1	A – 9.3
Major Street (4th St.)						
WB Left	N/A	N/A	A – 3.7	A – 2.6	A – 2.7	A – 1.8
NB Queue (HCM) – Ft.	N/A	N/A	4	4	3	3

It is important to note that the trip distribution for this project (based on a population gravity model within a two-mile radius of the site) demonstrates that the projected traffic generated by this project to and from the west of Solar Rd. is approximately 2 vehicles per hour (i.e., 2 eastbound right turns into Driveway "B" and 2 northbound left turns from Driveway "B"). In other words, the volume of traffic projected into the neighborhood to the west of this project is very minute, and will be comprised of the residents in the neighborhood themselves. This study does not project a significant volume of traffic west of the proposed project on Solar Rd.

Tony Loyd

Wednesday, December 07, 2005

Re: Queuing Analysis for Proposed Starbuck's (Solar Rd. / 4th St.)

Queuing at the intersection of Solar Rd. / 4th St. was evaluated in this study. The Synchro 6 queuing calculation reports the following queue lengths for eastbound and northbound traffic as follows:

Queuing Report Summary (Synchro 6)

Solar Rd. / 4th St.	CASE 1		CASE 2		CASE 3	
Queuing Dist. (Ft.)	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Minor Street (Solar Rd.)						
EB Left	54	58	72	77	62	68
EB Right	39	46	42	49	42	49
Major Street (4th St.)						
NB Lt. / Thru / Right	249	390#	274	403#	256	399#

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

The proposed Driveway "A" on 4th St. is located approximately 140 feet south of the stop bar for northbound traffic on 4th St. at Solar Rd. The projected PM Peak Hour queue for northbound traffic on 4th St. at Solar Rd. is in the range of 400 feet long in every Case analyzed above. The AM Peak Hour queue length is approximately 250 feet minimum. Therefore, there is a substantial probability that the driveway will be blocked during the AM and PM Peak Hour periods and eastbound exiting traffic will have difficulty making a left turn onto northbound 4th St.

The eastbound queue on Solar Rd. at 4th St. is in the range of 40 to 80 feet for the Cases analyzed in this report. The maximum calculated queue length was 77 feet long. The proposed Driveway "B" on Solar Rd. is approximately 120 feet west of the eastbound stop bar on Solar Rd. at 4th St. This analysis demonstrates that there should be sufficient room for queuing on Solar Rd. at 4th St. so as not to provide a significant probability of blocking the proposed driveway.

The data and findings contained in this report should be sufficient to provide a means upon which to evaluate the access to the proposed development.

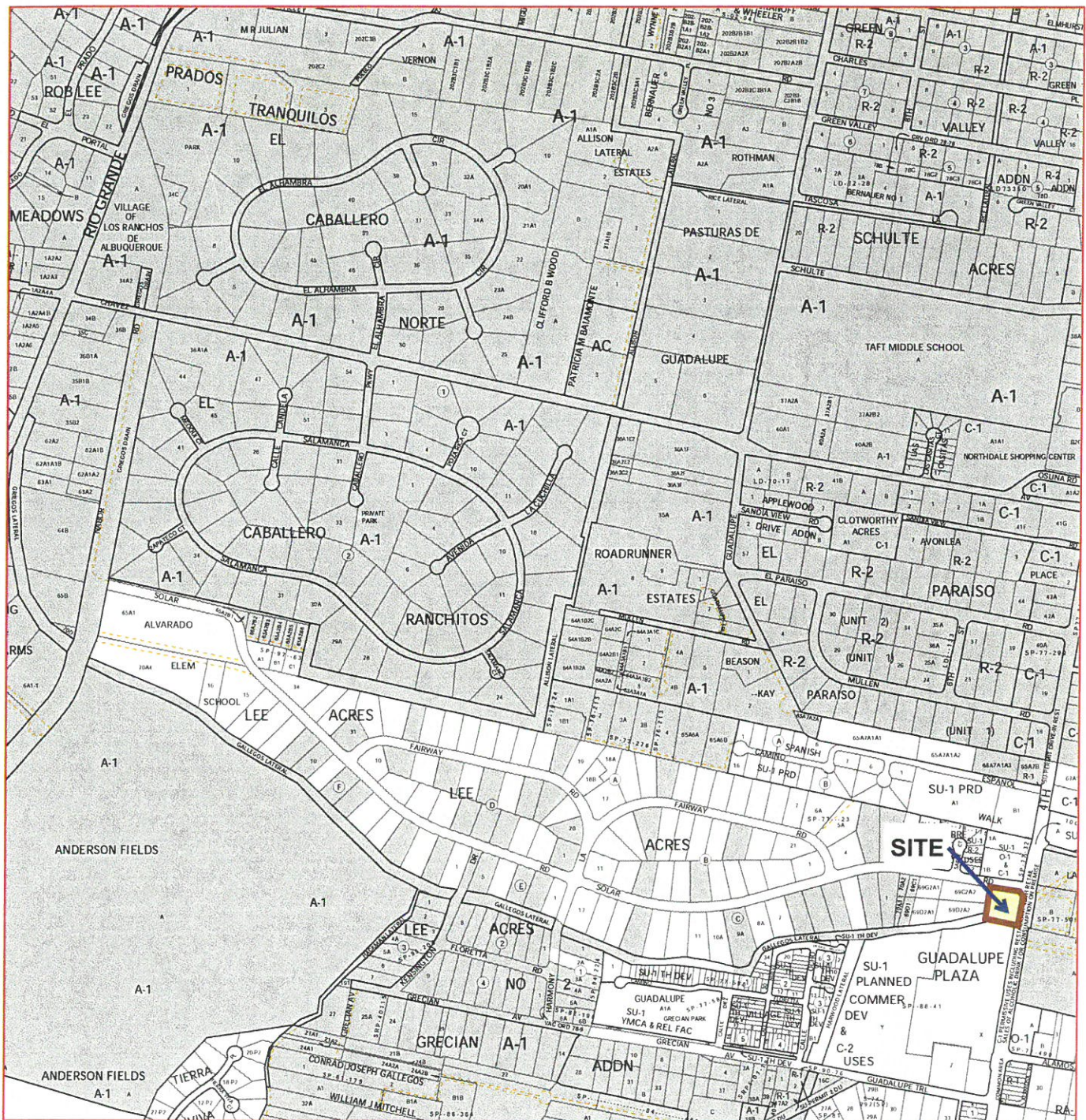
Please call me if you have questions or if you need additional information.

Sincerely,

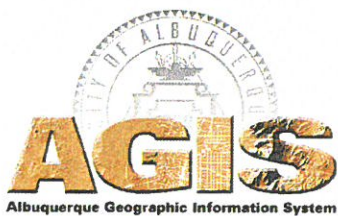


Terry O. Brown

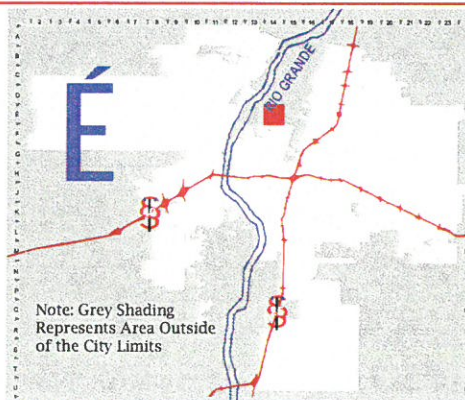
cc: Wes Butero, SCM Property Company, LLC w/attachments



For more current information and more details visit: <http://www.cabq.gov/gis>



Map amended through: Apr 22, 2005

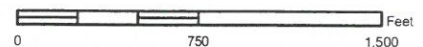


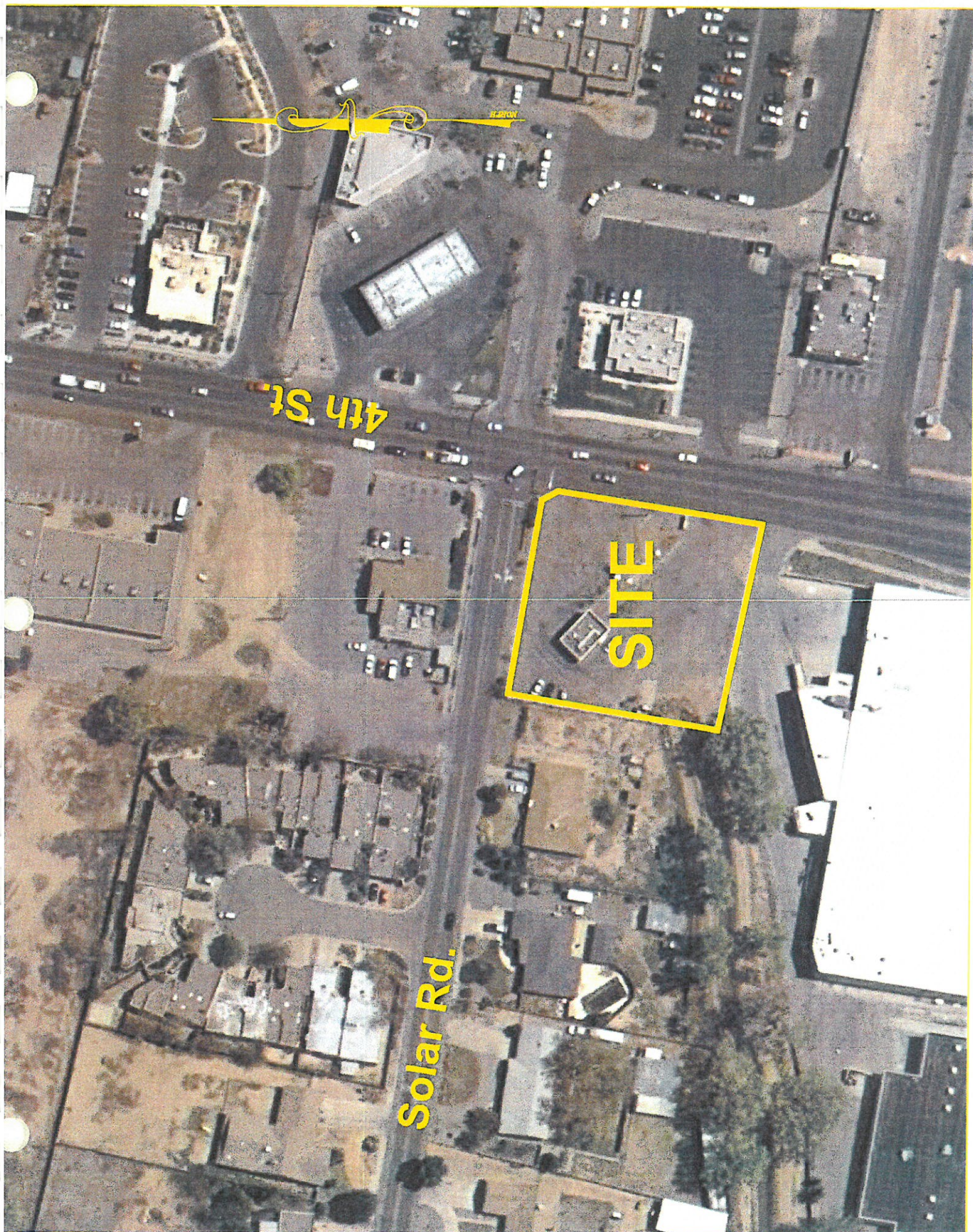
Zone Atlas Page:

E-14-Z

Selected Symbols

- Outside City Limits
- Sector Plans
- Design Overlay Zones
- City Historic Zone
- KKKH-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone





4th St.

Solar Rd.

SITE

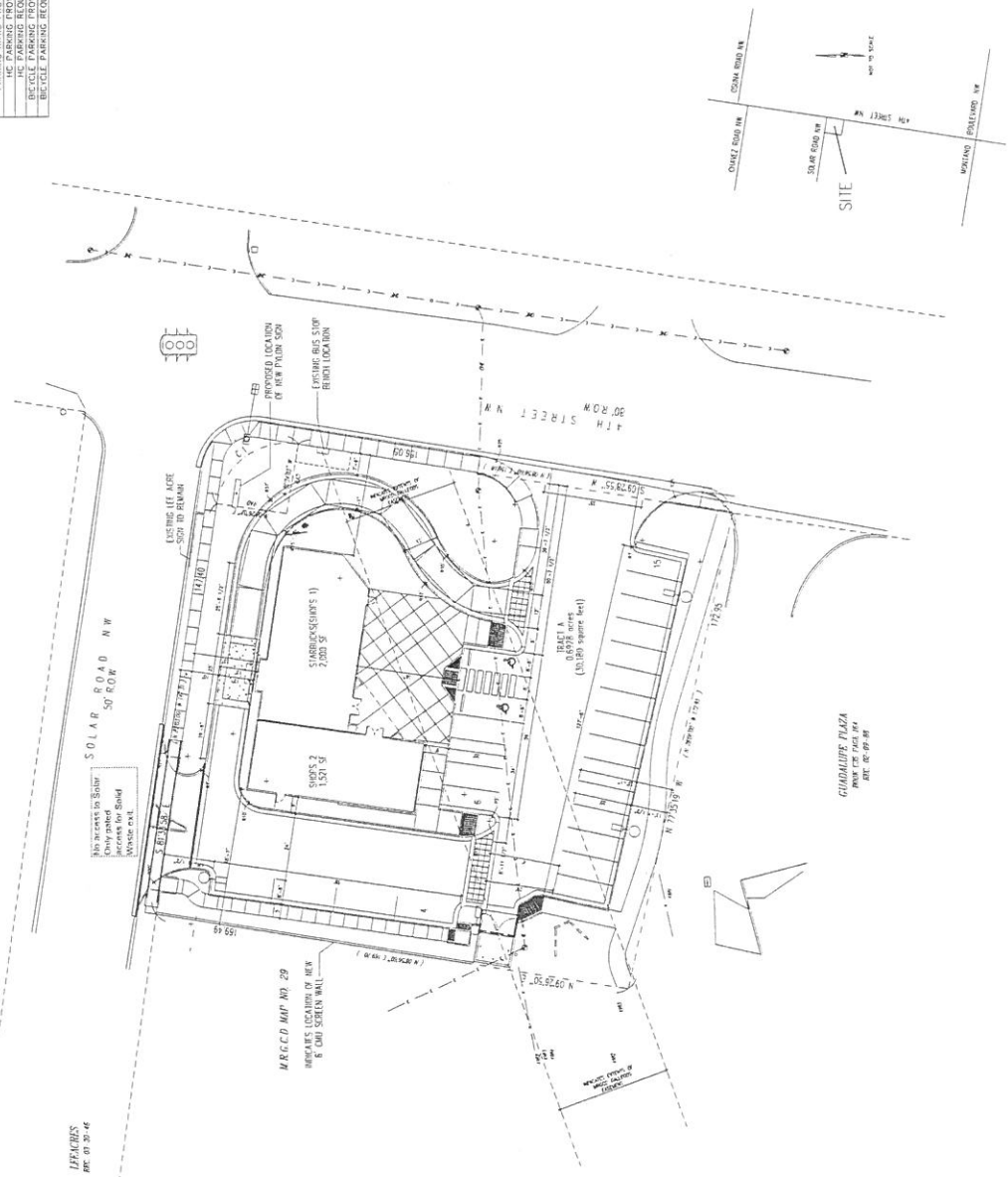
REV	DATE	BY	REVISION

GEORGE RAINHART ARCHITECT AND ASSOCIATES P.C.
 2325 SAN PEDRO N.E.
 SUITE 2-B
 ALBUQUERQUE, NEW MEXICO 87110
 PHONE (505) 884-9110
 FAX (505) 837-1877

PROJECT TITLE		DATE	SCALE
4TH AND SOLAR STARBUCKS		8/25/05	A1.0
PROJECT MANAGER	SHEET NO.	SHEET TOTAL	
STEPHEN DUNBAR	10	10	
JOB NO.	DRAWN BY		
50			

SITE DATA TABLE	
LEGAL DESCRIPTION	TRACT A, LANDS OF EVELYN H. FELLIS
EXISTING ZONING/USE	R-1/RESTAURANT
PROPOSED ZONING/USE	SU-1/2-1 PERMITTED DRIVE THRU AND OUTDOOR SEATING WITHIN 75' OF A RESIDENTIAL AREA
PARCEL AREA	0.0928 AC (0.0180 SF)
TOTAL BUILDING AREA	3,531 SF (SPACE 1+2+3+4) SPACE 2-1,531 SF)
MAXIMUM BUILDING HEIGHT	32'
TOTAL LANDSCAPE AREA	2,983 SF
TOTAL PAVING PROVIDED	2,983 SF
PARKING RATIO PROVIDED	7.1 STALLS / 1,000 SF
NET PAVING PROVIDED	2 STALLS (2 VAN ACCESSIBLE)
BIKE PARKING PROVIDED	2 SPACES
BIKE PARKING REQUIRED	2 SPACES

CURVE TABLE			
NO.	PI	PC	PY
1	100.00	100.00	100.00
2	100.00	100.00	100.00
3	100.00	100.00	100.00
4	100.00	100.00	100.00
5	100.00	100.00	100.00
6	100.00	100.00	100.00
7	100.00	100.00	100.00
8	100.00	100.00	100.00
9	100.00	100.00	100.00
10	100.00	100.00	100.00



SITE PLAN FOR BUILDING PERMIT

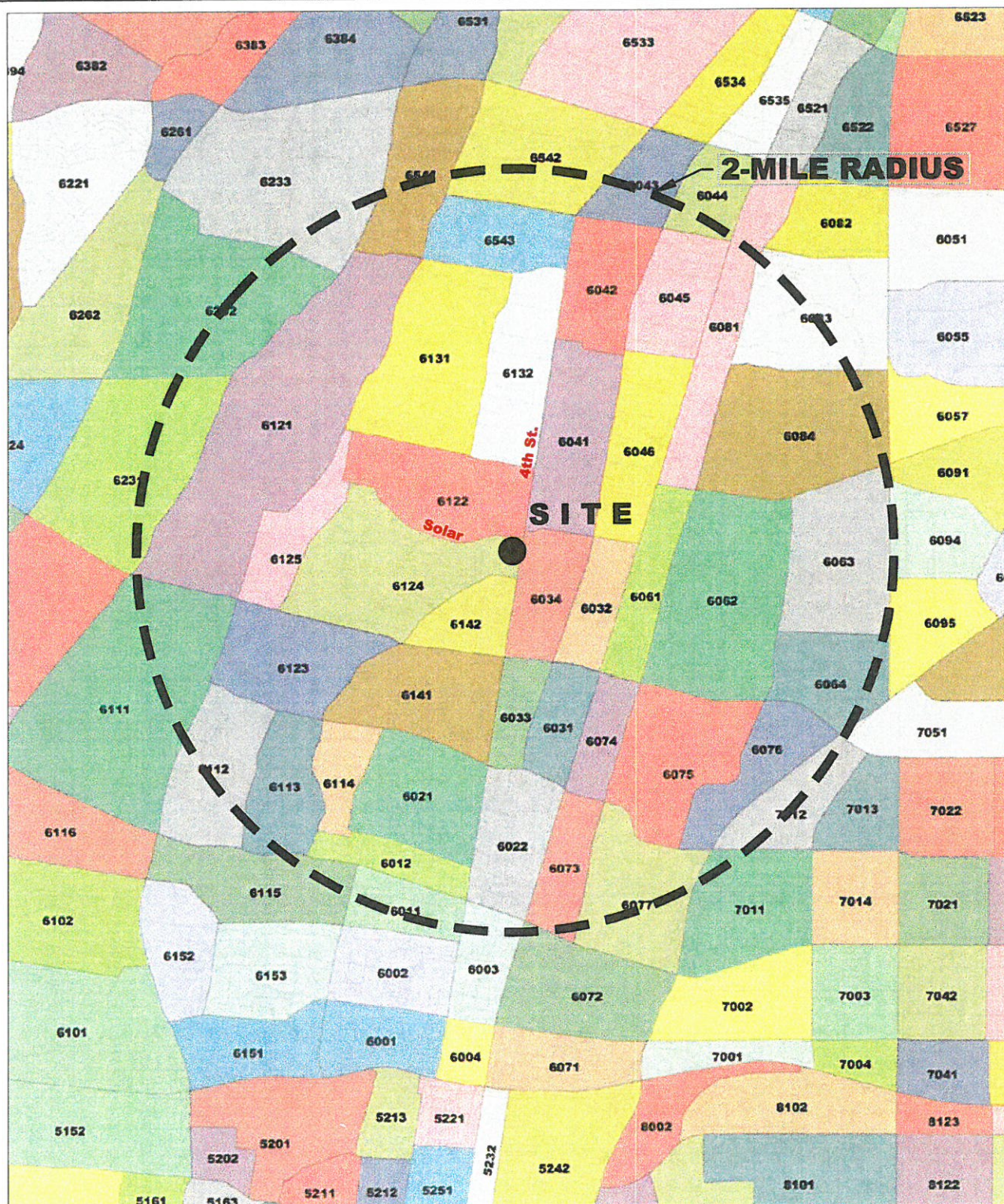


Starbucks's (Solar Rd. / 4th St.)

Trip Generation Data

USE (ITE CODE)	DESCRIPTION	24 HR VOL		A. M. PEAK HR.		P. M. PEAK HR.	
		GROSS		ENTER	EXIT	ENTER	EXIT
Summary Sheet							
	Fast Food Restaurant w/ Drive-Thru Window (934)	2.00	992	54	52	36	33
	Shopping Center (820)	1.52	447	8	5	19	21
	Subtotal		1,439	62	57	55	54

Units



DATA ANALYSIS SUBZONE (DASZ) MAP

Starbuck's (Solar / 4th St.)

Trip Distribution Table

Proposed Starbuck's (Solar Rd. / 4th St.)

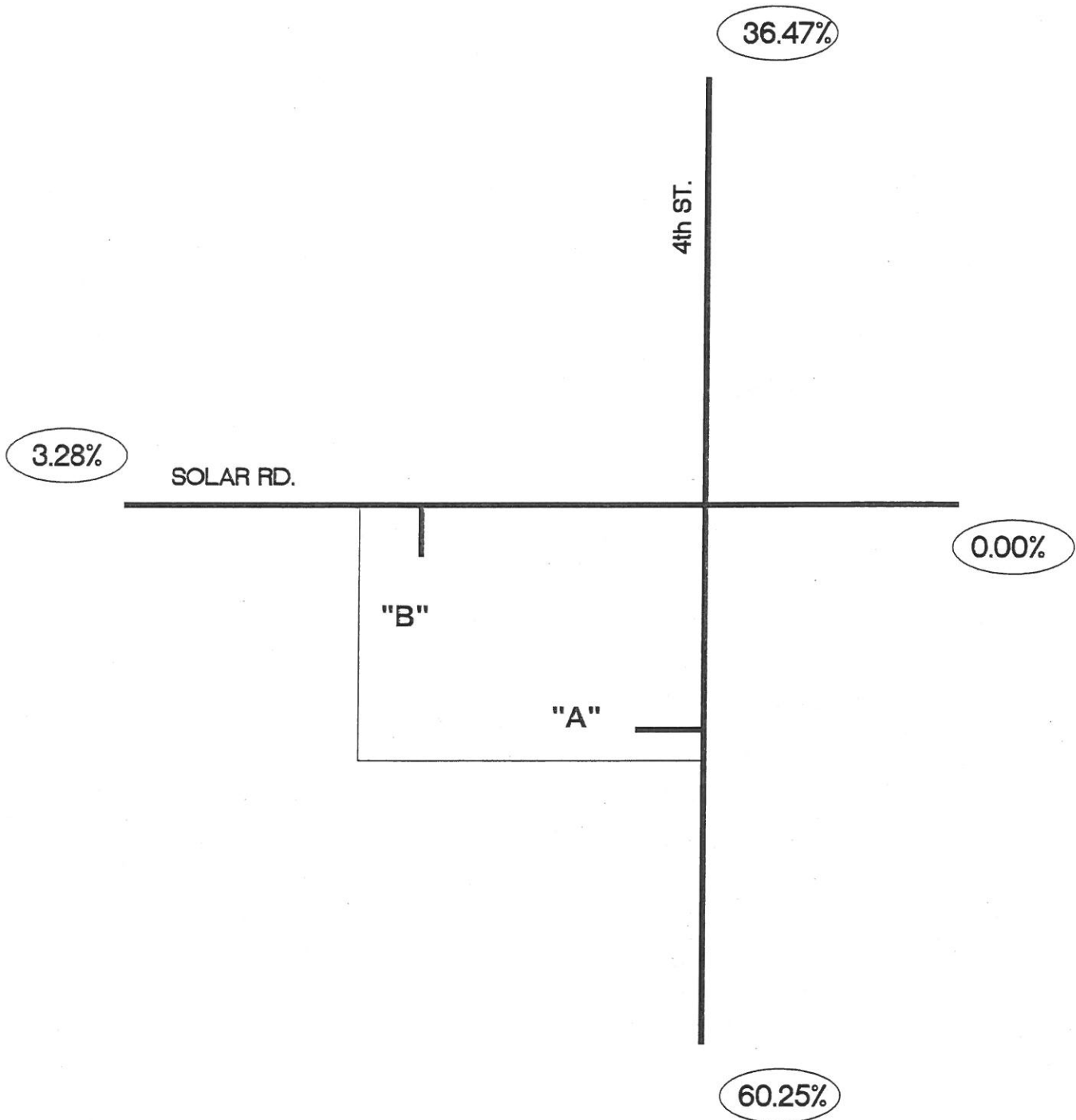
Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed Retail Commercial Trips

2000 and 2025 Data Taken from Mid-Region Council of Governments' 2025 Socioeconomic
2025 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico (S-03-01)

DASZ #	% Sub Area in Study	2000 Population	2025 Population	Interpolated Population for the Year 2006	Population in Study	Population / Distance	Percent Population	%
		2000	2025					
Boundary Specified on DASZ Map								
6003	10%	722	701	717	72	72	0.29%	
6011	60%	552	551	552	331	331	1.35%	
6012	100%	914	1030	942	942	942	3.84%	
6021	100%	2228	2220	2,226	2,226	2,226	9.07%	
6022	100%	1093	1114	1,098	1,098	1,098	4.47%	
6031	100%	374	636	437	437	437	1.78%	
6032	100%	670	683	673	673	673	2.74%	
6033	100%	561	546	557	557	557	2.27%	
6034	100%	465	509	476	476	476	1.94%	
6041	100%	1144	1318	1,186	1,186	1,186	4.83%	
6042	100%	387	482	410	410	410	1.67%	
6043	30%	369	927	503	151	151	0.62%	
6044	10%	214	223	216	22	22	0.09%	
6045	100%	699	684	695	695	695	2.83%	
6046	100%	661	619	651	651	651	2.65%	
6061	100%	411	610	459	459	459	1.87%	
6062	100%	1359	1526	1,399	1,399	1,399	5.70%	
6063	100%	0	2	0	0	0	0.00%	
6064	100%	0	0	0	0	0	0.00%	
6073	100%	48	49	48	48	48	0.20%	
6074	100%	53	48	52	52	52	0.21%	
6075	100%	99	97	99	99	99	0.40%	
6076	100%	3	3	3	3	3	0.01%	
6077	60%	354	388	362	217	217	0.88%	
6081	80%	280	467	325	260	260	1.06%	
6083	50%	322	2404	822	411	411	1.67%	
6084	90%	565	2145	944	850	850	3.46%	
6111	30%	1080	1081	1,080	324	324	1.32%	
6112	60%	954	937	950	570	570	2.32%	
6113	100%	598	596	598	598	598	2.44%	
6114	100%	788	724	773	773	773	3.15%	
6121	100%	672	690	676	676	676	2.75%	
6122	100%	868	851	864	864	864	3.52%	
6123	100%	657	766	683	683	683	2.78%	
6124	100%	727	796	744	744	744	3.03%	
6125	100%	79	167	100	100	100	0.41%	
6131	100%	483	591	509	509	509	2.07%	
6132	100%	716	711	715	715	715	2.91%	
6141	100%	1983	2029	1,994	1,994	1,994	8.12%	
6142	100%	565	545	560	560	560	2.28%	
6231	40%	40	529	157	63	63	0.26%	
6232	40%	339	1378	588	235	235	0.96%	
6233	10%	937	1077	971	97	97	0.40%	
6541	40%	129	161	137	55	55	0.22%	
6542	30%	522	882	608	182	182	0.74%	
6543	100%	411	453	421	421	421	1.71%	
6544	100%	411	453	421	421	421	1.71%	
7012	50%	464	530	480	240	240	0.98%	
				29,881	24,549	24,549	100.00%	

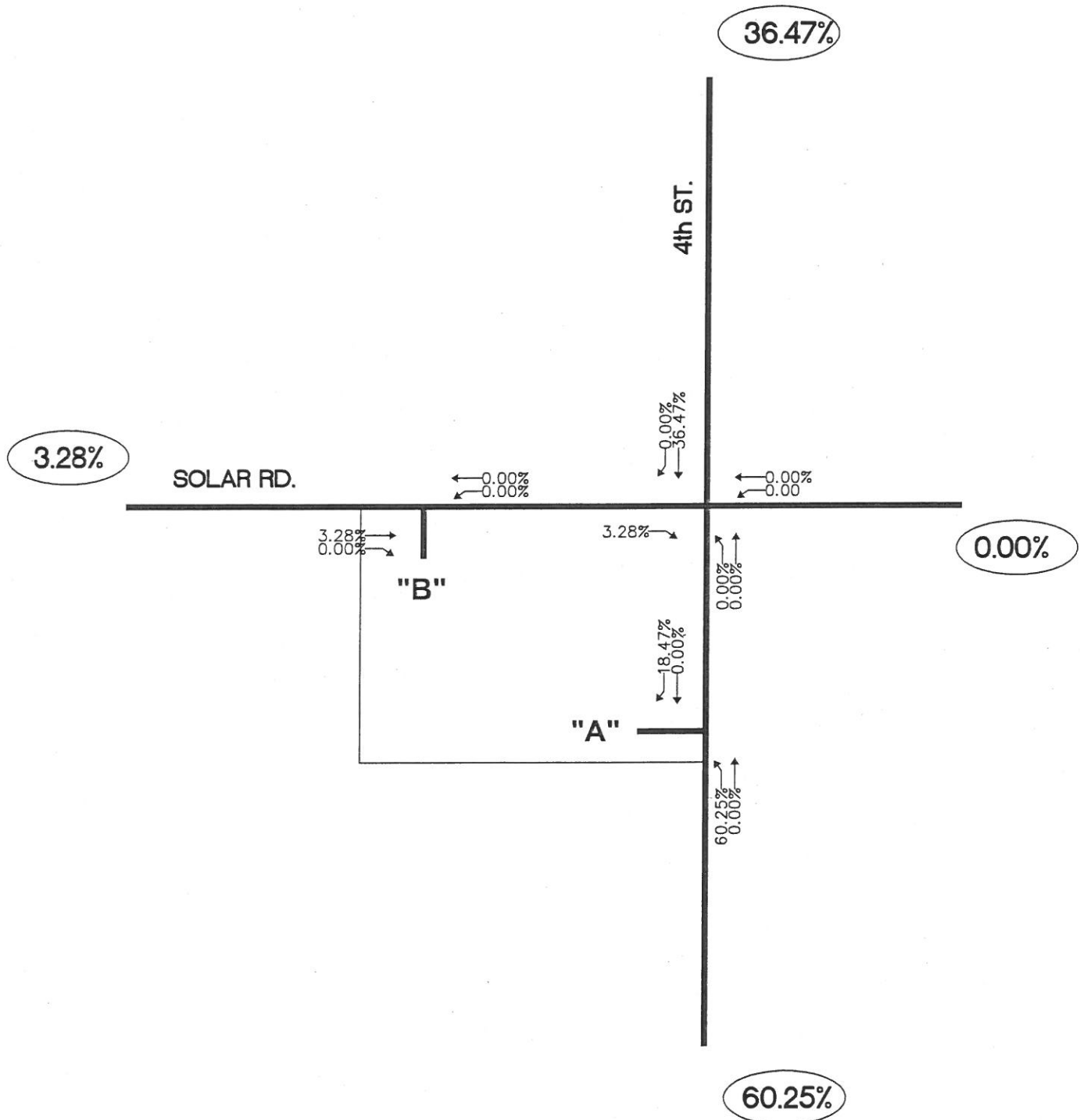
Starbuck's
(Solar Rd. / 4th St.)

Trip Distribution (%)



Starbuck's
(Solar Rd. / 4th St.)

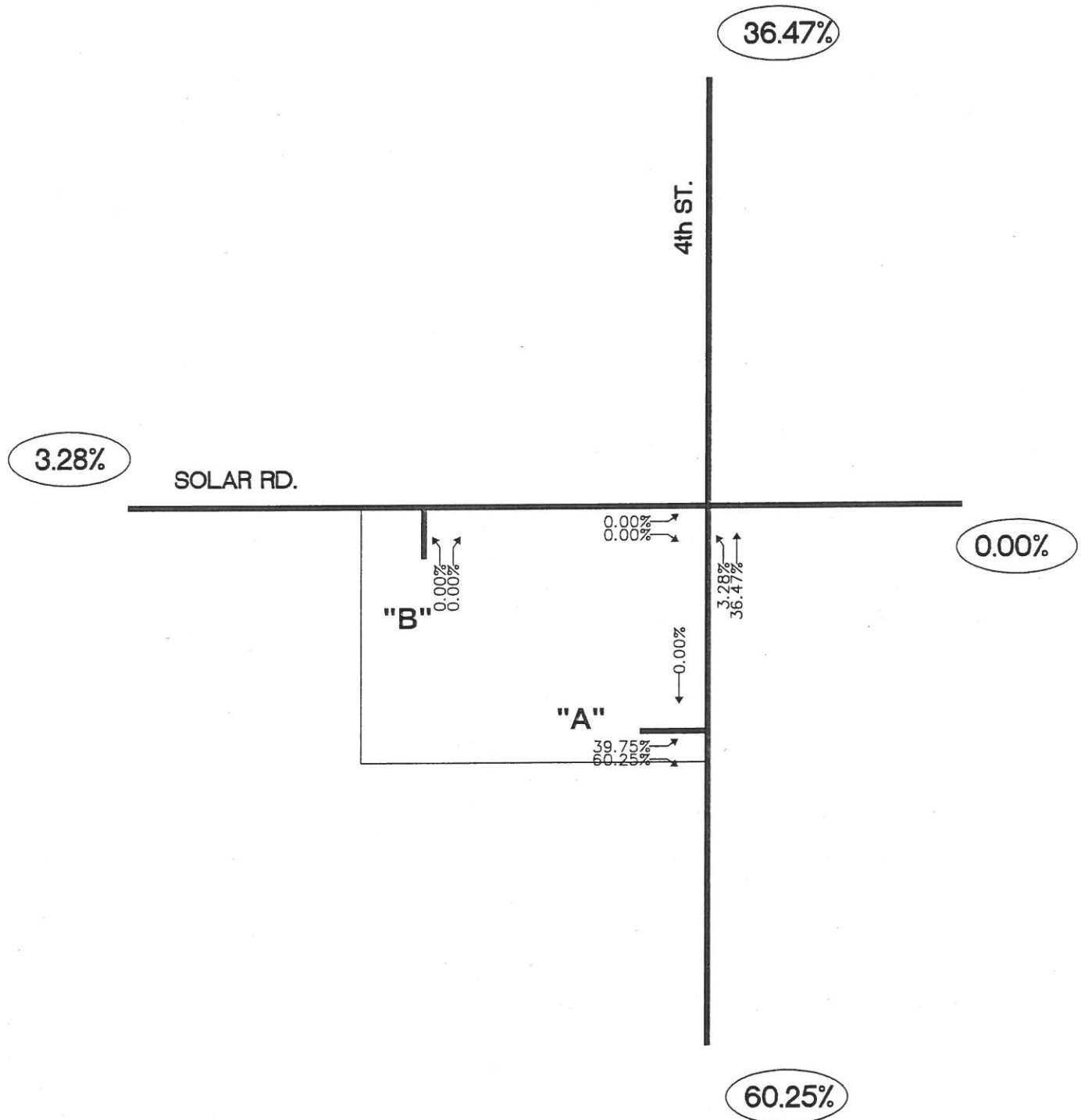
**Trip Assignments (% Entering)
without Solar Access**



CASE 1

Starbuck's
(Solar Rd. / 4th St.)

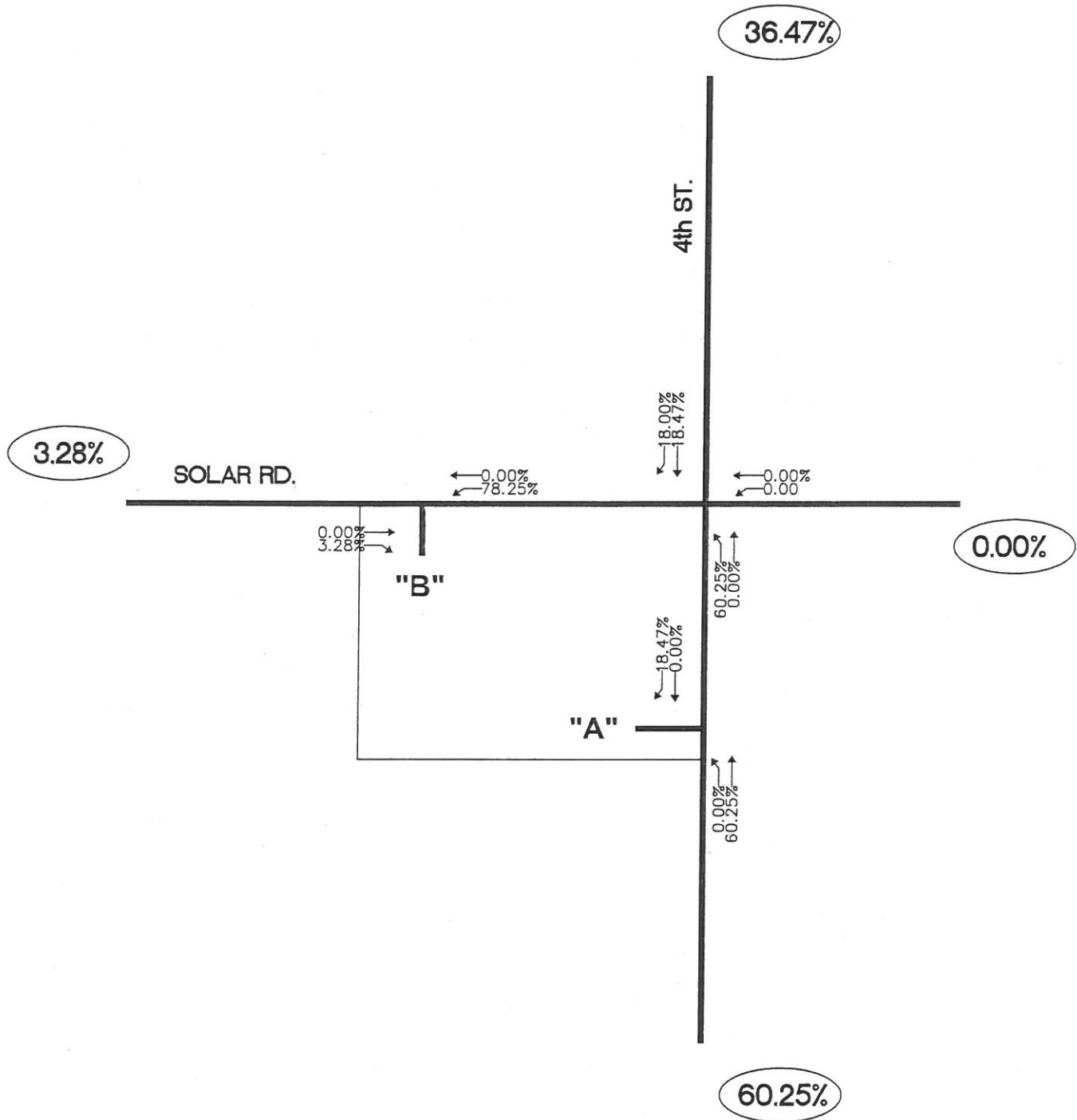
**Trip Assignments (% Exiting)
without Solar Access**



CASE 1

Starbuck's
(Solar Rd. / 4th St.)

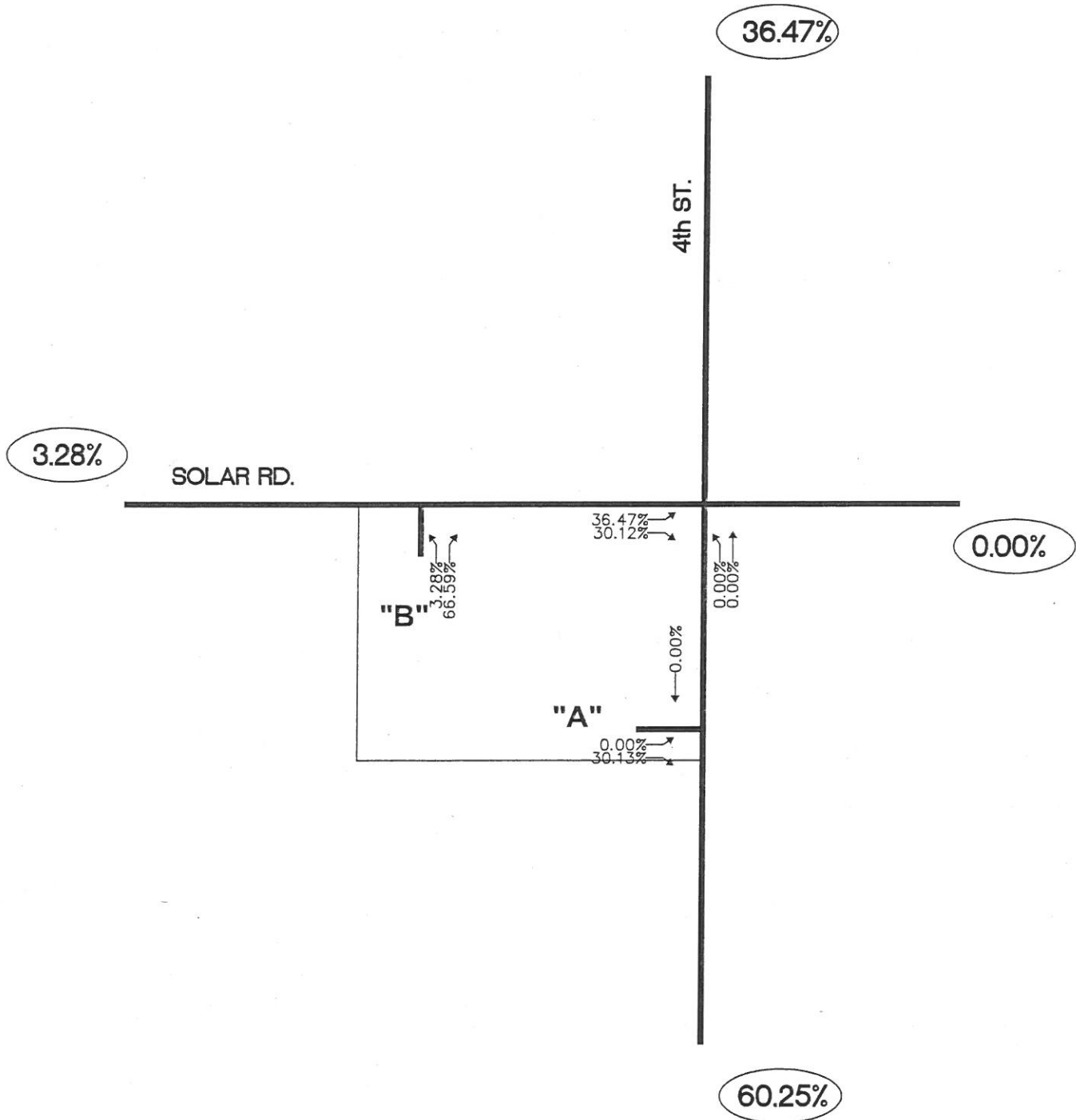
Trip Assignments (% Entering)
with Solar Access (RIGHT-IN, RIGHT-OUT ON 4TH)



CASE 2

Starbuck's
(Solar Rd. / 4th St.)

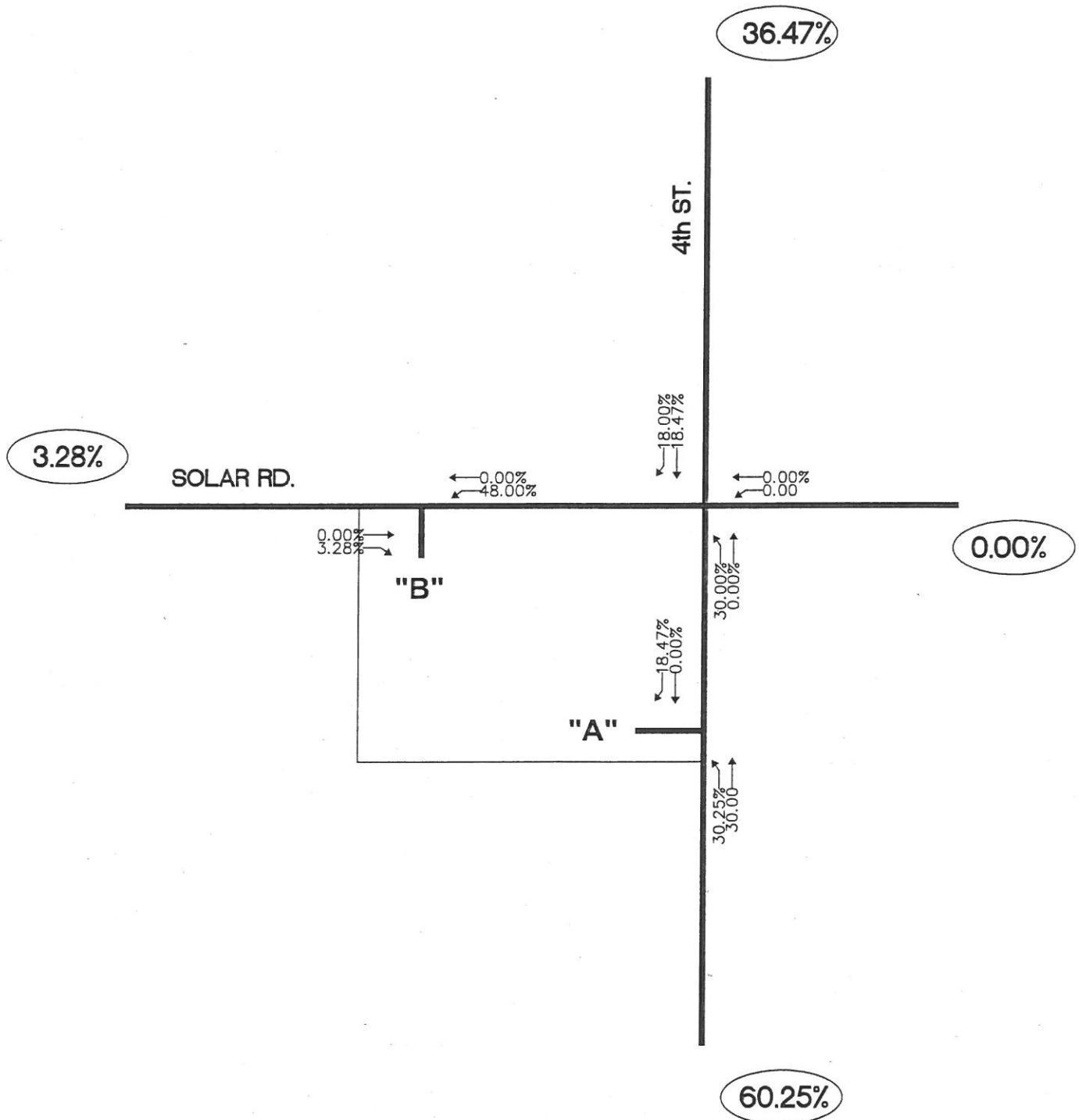
Trip Assignments (% Exiting)
with Solar Access (RIGHT-IN, RIGHT-OUT ON 4TH)



CASE 2

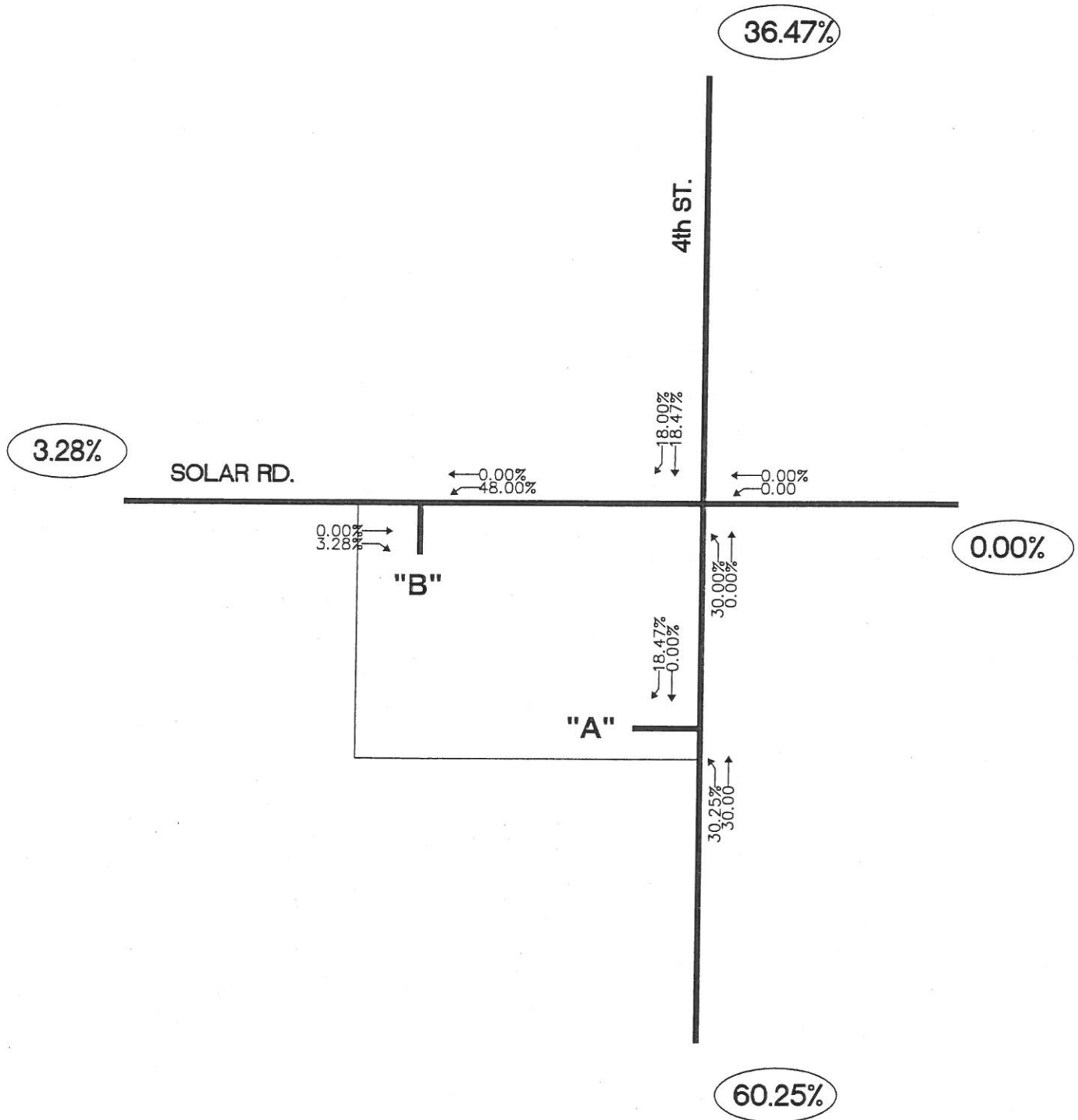
Starbuck's
(Solar Rd. / 4th St.)

**Trip Assignments (% Entering)
with Solar Access**



CASE 3

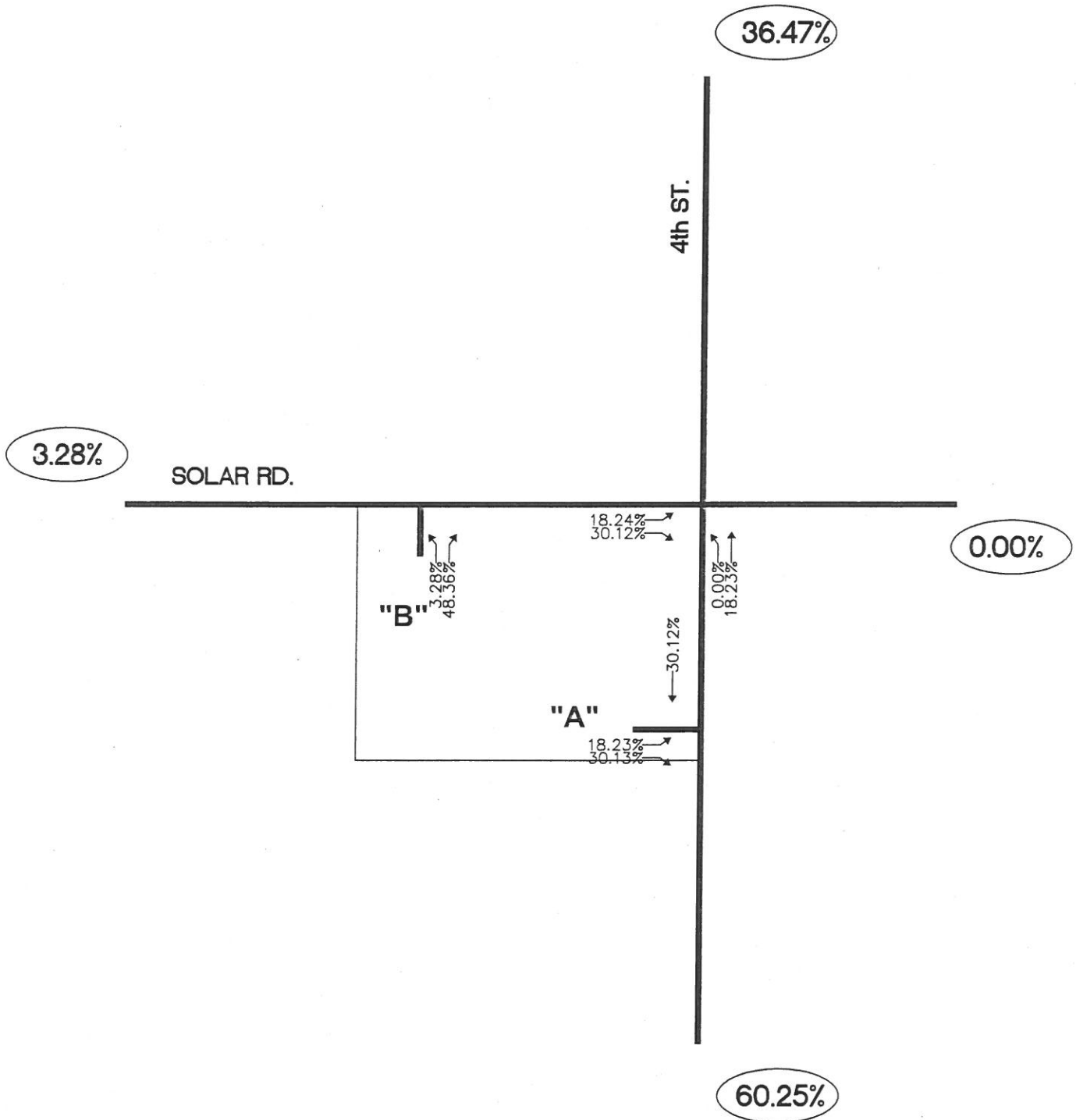
Starbuck's
(Solar Rd. / 4th St.)
Trip Assignments (% Entering)
with Solar Access



CASE 3

Starbuck's
(Solar Rd. / 4th St.)

**Trip Assignments (% Exiting)
with Solar Access**



CASE 3

Starbuck's (Solar / 4th)
 Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2006) - 100% Development
Case 1 (without Solar Access)

INTERSECTION: Summary

Solar Rd. / 4th St.

(1)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40	4	60	30	4	5	43	612	14	4	873	8	
41	4	61	31	4	5	45	630	15	4	899	8	
41	4	63	31	4	5	47	651	15	4	922	8	

Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
45	5	92	60	15	4	59	753	14	6	1,171	21	
47	5	94	61	16	4	60	775	15	6	1,205	21	
47	5	96	61	16	4	62	795	15	6	1,225	21	

Driveway "A" / 4th St.

(2)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	650	0	0	935	0	
0	0	0	0	0	0	0	670	0	0	963	0	
23	0	34	0	0	0	37	670	0	0	963	11	

Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	802	0	0	1,284	0	
0	0	0	0	0	0	0	826	0	0	1,323	0	
21	0	33	0	0	0	33	826	0	0	1,323	10	

Solar Rd. / Driveway "B"

(3)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	101	0	0	54	0	0	0	0	0	0	0	
0	104	0	0	56	0	0	0	0	0	0	0	
0	106	0	0	58	0	0	0	0	0	0	0	

Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	138	0	0	92	0	0	0	0	0	0	0	
0	142	0	0	95	0	0	0	0	0	0	0	
0	144	0	0	97	0	0	0	0	0	0	0	

Starbuck's (Solar / 4th)
Projected Turning Movements Worksheet
Solar Rd. / 4th St.

Case 1 (without Solar Access)

(1)

INTERSECTION:

E-W Street: **Solar Rd.**

N-S Street: **4th St.**

Year of Existing Counts

2004

Implementation Year

2006

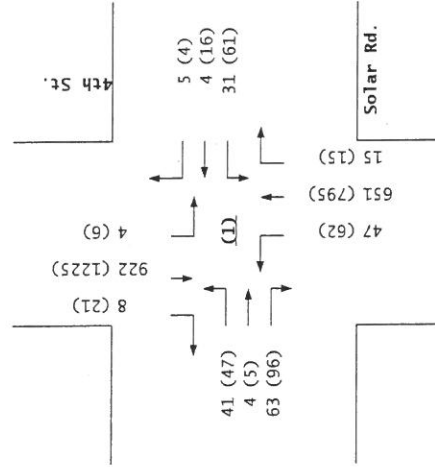
Growth Rates

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	39	4	58	29	4	5	42	594	14	4	848	8
Background Traffic Growth	2	0	3	2	0	0	3	36	1	0	51	0
Subtotal (NO BUILD - A.M.)	41	4	61	31	4	5	45	630	15	4	899	8
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	36.47%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	36.47%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	2	0	0	0	2	21	0	0	23	0
Total AM Peak Hour BUILD Volumes	41	4	63	31	4	5	47	651	15	4	922	8

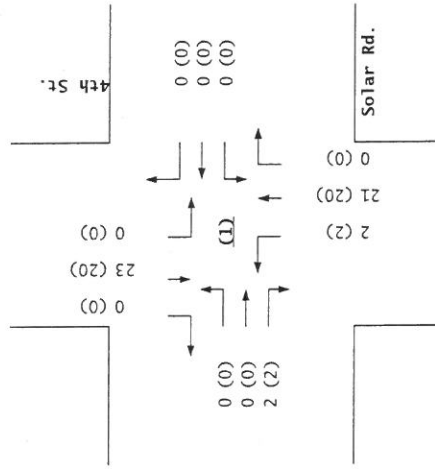
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	44	5	89	58	15	4	57	731	14	6	1,137	20
Background Traffic Growth	3	0	5	3	1	0	3	44	1	0	68	1
Subtotal (NO BUILD - P.M.)	47	5	94	61	16	4	60	775	15	6	1,205	21
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	36.47%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	36.47%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	2	0	0	0	2	20	0	0	20	0
Total PM Peak Hour BUILD Volumes	47	5	96	61	16	4	62	795	15	6	1,225	21

Number of Commercial Trips Generated	Entering	Exiting	A.M.	100% Commercial Development
	62	57	P.M.	
	55	54		

2006
BUILD

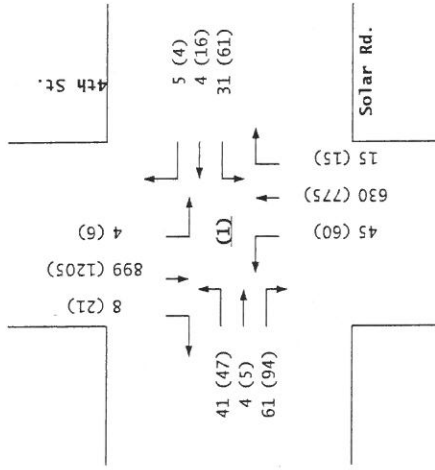


Trips



Case 1 (without Solar Access)

2006
NO BUILD



Solar Rd. / 4th St.

Starbucks (Solar / 4th)
Projected Turning Movements Worksheet
Driveway "A" / 4th St.

Case 1 (without Solar Access)

(2)

INTERSECTION:E-W Street: **Driveway "A"**N-S Street: **4th St.**Year of Existing Counts **2005**Implementation Year **2006**

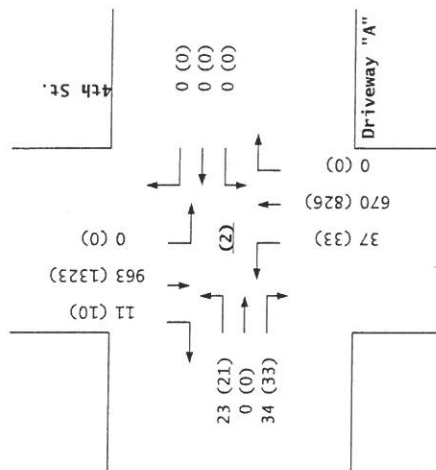
Growth Rates

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	650	0	0	935	0
Background Traffic Growth	0	0	0	0	0	0	0	20	0	0	28	0
Subtotal (NO BUILD - A.M.)	0	0	0	0	0	0	0	670	0	0	963	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.25%	0.00%	0.00%	0.00%	0.00%	18.47%
Percent Commercial Trips Generated(Exiting)	39.75%	0.00%	60.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	23	0	34	0	0	0	37	0	0	0	0	11
Total AM Peak Hour BUILD Volumes	23	0	34	0	0	0	37	670	0	0	963	11

	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	802	0	0	1,284	0
Background Traffic Growth	0	0	0	0	0	0	0	24	0	0	39	0
Subtotal (NO BUILD - P.M.)	0	0	0	0	0	0	0	826	0	0	1,323	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.25%	0.00%	0.00%	0.00%	0.00%	18.47%
Percent Commercial Trips Generated(Exiting)	39.75%	0.00%	60.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	21	0	33	0	0	0	33	0	0	0	0	10
Total PM Peak Hour BUILD Volumes	21	0	33	0	0	0	33	826	0	0	1,323	10

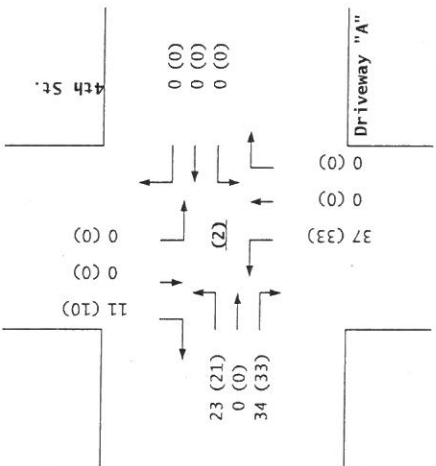
Number of Commercial Trips Generated	Entering	Exiting	A.M.	100% Commercial Development
	62	57		
	55	54	P.M.	

2006
BUILD

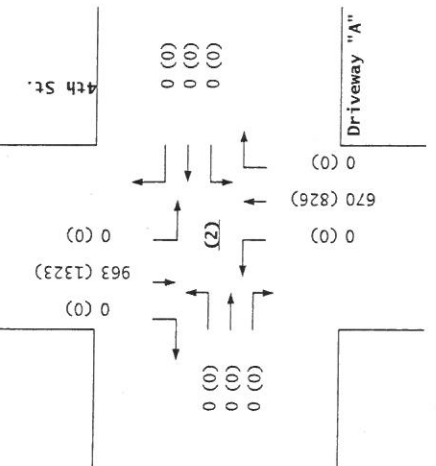


Trips

Case 1 (without Solar Access)



2006
NO BUILD



Driveway "A" / 4th St.

Starbucks (Solar / 4th)
Projected Turning Movements Worksheet

Solar Rd. / Driveway "B"

Case 1 (without Solar Access)

(3)

INTERSECTION:

E-W Street: **Solar Rd.**

N-S Street: **Driveway "B"**

Year of Existing Counts

2005

Implementation Year

2006

Growth Rates

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - A.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total AM Peak Hour BUILD Volumes

3.00%			3.00%			3.00%			3.00%		
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	101	0	0	54	0	0	0	0	0	0	0
0	3	0	0	2	0	0	0	0	0	0	0
0	104	0	0	56	0	0	0	0	0	0	0
0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0	2	0	0	2	0	0	0	0	0	0	0
0	106	0	0	58	0	0	0	0	0	0	0

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - P.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total PM Peak Hour BUILD Volumes

3.00%			3.00%			3.00%			3.00%		
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	138	0	0	92	0	0	0	0	0	0	0
0	4	0	0	3	0	0	0	0	0	0	0
0	142	0	0	95	0	0	0	0	0	0	0
0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0	2	0	0	2	0	0	0	0	0	0	0
0	144	0	0	97	0	0	0	0	0	0	0

Number of Commercial Trips Generated

Entering

Exiting

A.M.

100% Commercial Development

62

57

P.M.

55

54

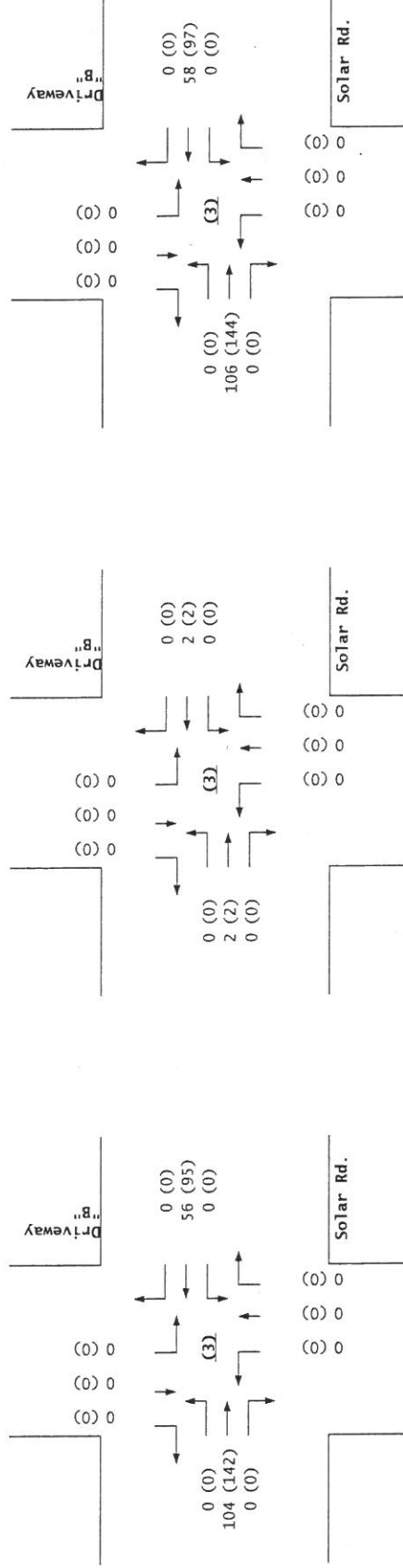
P.M.

2006
BUILD

Case 1 (without Solar Access)

2006
NO BUILD

Trips



Starbucks (Solar / 4th)
 Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2006) - 100% Development
Case 2 (with Solar Access - RIGHT-IN, RIGHT-OUT ON 4TH)

INTERSECTION: Summary

Solar Rd. / 4th St.

(1)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40	4	60	30	4	5	43	612	14	4	873	8	
41	4	61	31	4	5	45	630	15	4	899	8	
62	4	78	31	4	5	82	630	15	4	910	19	

Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
45	5	92	60	15	4	59	753	14	6	1,171	21	
47	5	94	61	16	4	60	775	15	6	1,205	21	
67	5	110	61	16	4	93	775	15	6	1,215	31	

Driveway "A" / 4th St.

(2)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	650	0	0	935	0	
0	0	0	0	0	0	0	670	0	0	963	0	
0	0	17	0	0	0	0	707	0	0	963	11	

Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	802	0	0	1,284	0	
0	0	0	0	0	0	0	826	0	0	1,323	0	
0	0	16	0	0	0	0	859	0	0	1,323	10	

Solar Rd. / Driveway "B"

(3)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	101	0	0	54	0	0	0	0	0	0	0	
0	104	0	0	56	0	0	0	0	0	0	0	
0	104	2	49	56	0	2	0	38	0	0	0	

Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	138	0	0	92	0	0	0	0	0	0	0	
0	142	0	0	95	0	0	0	0	0	0	0	
0	142	2	43	95	0	2	0	36	0	0	0	

Starbuck's (Solar / 4th)
Projected Turning Movements Worksheet
Solar Rd. / 4th St.

Case 2 (with Solar Access - RIGHT-IN, RIGHT-OUT ON 4TH)

INTERSECTION: E-W Street: **Solar Rd.**
N-S Street: **4th St.**
Year of Existing Counts: **2004**
Implementation Year: **2006**
Growth Rates: **3.00%**

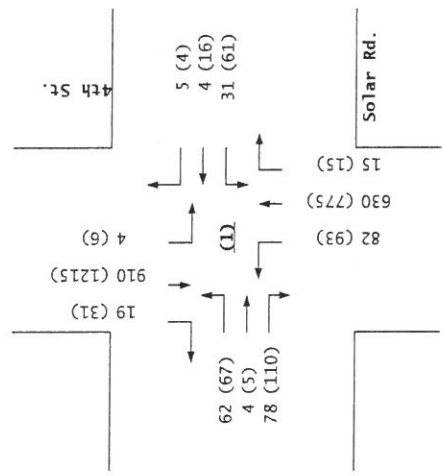
	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	39	4	58	29	4	5	42	594	14	4	848	8
Background Traffic Growth	2	0	3	2	0	0	3	36	1	0	51	0
Subtotal (NO BUILD - A.M.)	41	4	61	31	4	5	45	630	15	4	899	8
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.25%	0.00%	0.00%	0.00%	18.47%	18.00%
Percent Commercial Trips Generated(Exiting)	36.47%	0.00%	30.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	21	0	17	0	0	0	37	0	0	0	11	11
Total AM Peak Hour BUILD Volumes	62	4	78	31	4	5	82	630	15	4	910	19

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	44	5	89	58	15	4	57	731	14	6	1,137	20
Background Traffic Growth	3	0	5	3	1	0	3	44	1	0	68	1
Subtotal (NO BUILD - P.M.)	47	5	94	61	16	4	60	775	15	6	1,205	21
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.25%	0.00%	0.00%	0.00%	18.47%	18.00%
Percent Commercial Trips Generated(Exiting)	36.47%	0.00%	30.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	20	0	16	0	0	0	33	0	0	0	10	10
Total PM Peak Hour BUILD Volumes	67	5	110	61	16	4	93	775	15	6	1,215	31

Number of Commercial Trips Generated

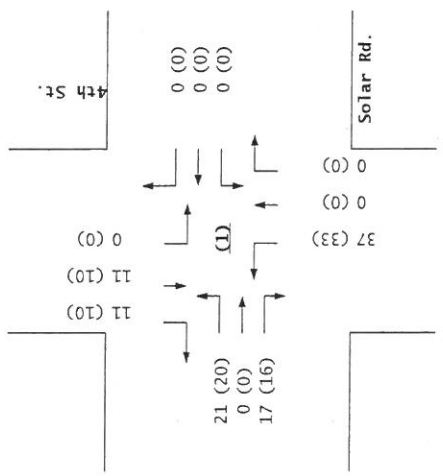
Entering	62	57	A.M.	100% Commercial Development
Exiting	55	54	P.M.	

2006
BUILD

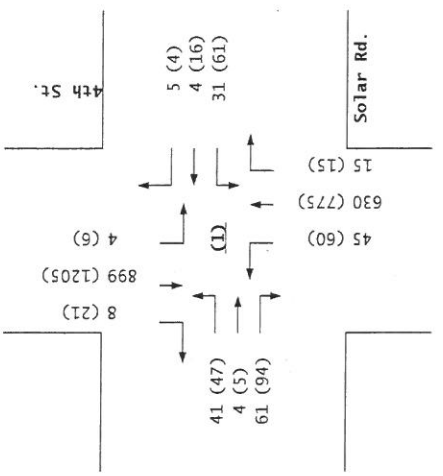


Case 2 (with Solar Access - RIGHT-IN, RIGHT-OUT ON 4TH)

Trips



2006
NO BUILD



Starbucks (Solar / 4th)
Projected Turning Movements Worksheet
Driveway "A" / 4th St.

Case 2 (with Solar Access - RIGHT-IN, RIGHT-OUT ON 4TH)

INTERSECTION: E-W Street: Driveway "A"
N-S Street: 4th St.
Year of Existing Counts: 2005
Implementation Year: 2006

(2)

Growth Rates

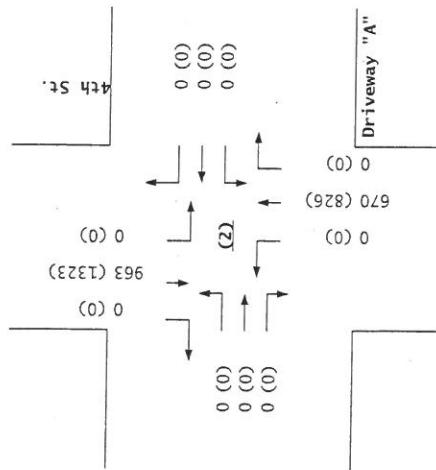
	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	650	0	0	935	0
Background Traffic Growth	0	0	0	0	0	0	0	20	0	0	28	0
Subtotal (NO BUILD - A.M.)	0	0	0	0	0	0	0	670	0	0	963	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.25%	0.00%	0.00%	0.00%	18.47%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	30.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	17	0	0	0	0	37	0	0	0	11
Total AM Peak Hour BUILD Volumes	0	0	17	0	0	0	0	707	0	0	963	11

	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	802	0	0	1,284	0
Background Traffic Growth	0	0	0	0	0	0	0	24	0	0	39	0
Subtotal (NO BUILD - P.M.)	0	0	0	0	0	0	0	826	0	0	1,323	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.25%	0.00%	0.00%	0.00%	18.47%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	30.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	16	0	0	0	0	33	0	0	0	10
Total PM Peak Hour BUILD Volumes	0	0	16	0	0	0	0	859	0	0	1,323	10

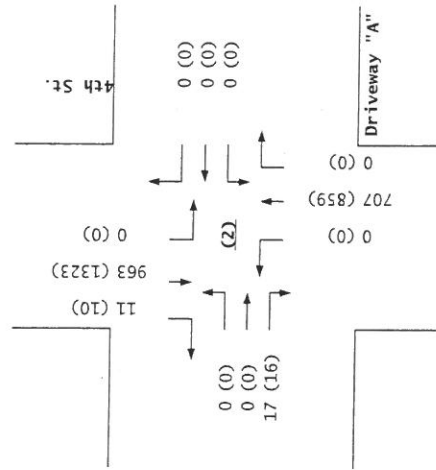
Number of Commercial Trips Generated	Entering	Exiting	A.M.	100% Commercial Development
	62	57	P.M.	
	55	54		

Case 2 (with Solar Access - RIGHT-IN, RIGHT-OUT ON 4TH)

2006
NO BUILD



2006
BUILD



Driveway "A" / 4th St.

Starbucks (Solar / 4th)
Projected Turning Movements Worksheet
Solar Rd. / Driveway "B"

Case 2 (with Solar Access - RIGHT-IN, RIGHT-OUT ON 4TH)

(3)

INTERSECTION:

E-W Street: **Solar Rd.**
N-S Street: **Driveway "B"**

Year of Existing Counts: **2005**
Implementation Year: **2006**

Growth Rates

3.00%

3.00%

3.00%

3.00%

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - A.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total AM Peak Hour BUILD Volumes

Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	101	0	0	54	0	0	0	0	0	0	0
0	3	0	0	2	0	0	0	0	0	0	0
0	104	0	0	56	0	0	0	0	0	0	0
0.00%	0.00%	3.28%	78.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	66.59%	0.00%	0.00%	0.00%
0	0	2	49	0	0	2	0	38	0	0	0
0	104	2	49	56	0	2	0	38	0	0	0

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - P.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total PM Peak Hour BUILD Volumes

Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	138	0	0	92	0	0	0	0	0	0	0
0	4	0	0	3	0	0	0	0	0	0	0
0	142	0	0	95	0	0	0	0	0	0	0
0.00%	0.00%	3.28%	78.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	66.59%	0.00%	0.00%	0.00%
0	0	2	43	0	0	2	0	36	0	0	0
0	142	2	43	95	0	2	0	36	0	0	0

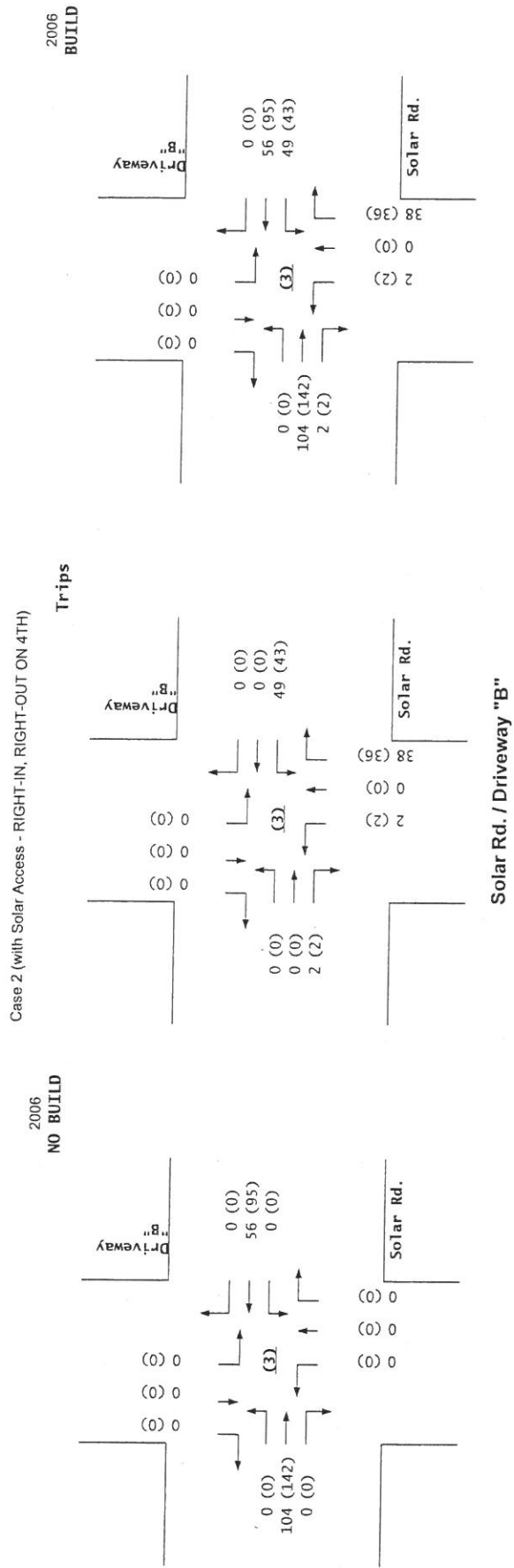
Number of Commercial Trips Generated

Entering Exiting

62 57
55 54

A.M.
P.M.

100% Commercial Development



Starbucks (Solar / 4th)
 Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2006) - 100% Development
Case 3 (with Solar Access)

INTERSECTION:

Summary**Solar Rd. / 4th St.**

- (1)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40	4	60	30	4	5	43	612	14	4	873	8	
41	4	61	31	4	5	45	630	15	4	899	8	
51	4	78	31	4	5	64	640	15	4	910	19	

- Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
45	5	92	60	15	4	59	753	14	6	1,171	21	
47	5	94	61	16	4	60	775	15	6	1,205	21	
57	5	110	61	16	4	77	785	15	6	1,215	31	

Driveway "A" / 4th St.

- (2)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	650	0	0	935	0	
0	0	0	0	0	0	0	670	0	0	963	0	
10	0	17	0	0	0	19	689	0	0	963	11	

- Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	802	0	0	1,284	0	
0	0	0	0	0	0	0	826	0	0	1,323	0	
10	0	16	0	0	0	17	843	0	0	1,323	10	

Solar Rd. / Driveway "B"

- (3)
 2.0% Truck
 Existing (2005)
 2006 (NO BUILD - A.M.)
 2006 (BUILD - A.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	101	0	0	54	0	0	0	0	0	0	0	
0	104	0	0	56	0	0	0	0	0	0	0	
0	104	2	30	56	0	2	0	28	0	0	0	

- Existing (2005)
 2006 (NO BUILD - P.M.)
 2006 (BUILD - P.M.)

0.90			0.90			0.90			0.90			PHF
Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	138	0	0	92	0	0	0	0	0	0	0	
0	142	0	0	95	0	0	0	0	0	0	0	
0	142	2	26	95	0	2	0	26	0	0	0	

Starbucks (Solar / 4th)
Projected Turning Movements Worksheet
Solar Rd. / 4th St.

CASE 3 (with Solar Access)

(1)

INTERSECTION:

E-W Street: **Solar Rd.**

N-S Street: **4th St.**

Year of Existing Counts **2004**

Implementation Year **2006**

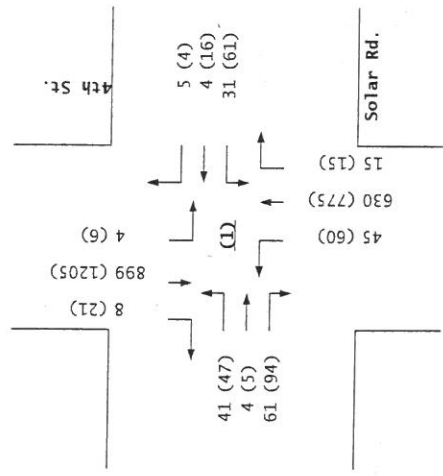
Growth Rates

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	39	4	58	29	4	5	42	594	14	4	848	8
Background Traffic Growth	2	0	3	2	0	0	3	36	1	0	51	0
Subtotal (NO BUILD - A.M.)	41	4	61	31	4	5	45	630	15	4	899	8
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	18.47%	18.00%
Percent Commercial Trips Generated(Exiting)	18.24%	0.00%	30.12%	0.00%	0.00%	0.00%	0.00%	18.23%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	10	0	17	0	0	0	19	10	0	0	11	11
Total AM Peak Hour BUILD Volumes	51	4	78	31	4	5	64	640	15	4	910	19

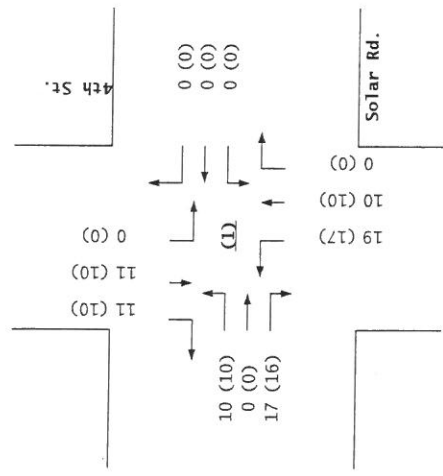
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	44	5	89	58	15	4	57	731	14	6	1,137	20
Background Traffic Growth	3	0	5	3	1	0	3	44	1	0	68	1
Subtotal (NO BUILD - P.M.)	47	5	94	61	16	4	60	775	15	6	1,205	21
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	18.47%	18.00%
Percent Commercial Trips Generated(Exiting)	18.24%	0.00%	30.12%	0.00%	0.00%	0.00%	0.00%	18.23%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	10	0	16	0	0	0	17	10	0	0	10	10
Total PM Peak Hour BUILD Volumes	57	5	110	61	16	4	77	785	15	6	1,215	31

Number of Commercial Trips Generated	Entering	Exiting	A.M.	100% Commercial Development
	62	57		
	55	54	P.M.	

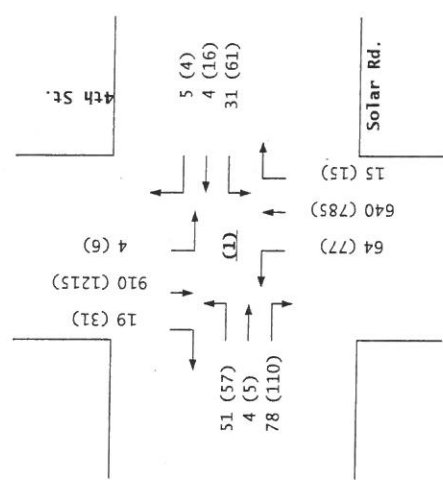
2006
NO BUILD



Trips



2006
BUILD



Solar Rd. / 4th St.

Starbuck's (Solar / 4th)
Projected Turning Movements Worksheet
Driveway "A" / 4th St.

CASE 3 (with Solar Access)

INTERSECTION: E-W Street: Driveway "A"
N-S Street: 4th St.
Year of Existing Counts: 2005
Implementation Year: 2006

Growth Rates

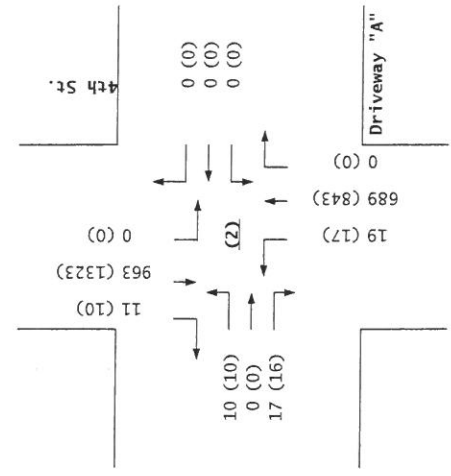
	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	650	0	0	935	0
Background Traffic Growth	0	0	0	0	0	0	0	20	0	0	28	0
Subtotal (NO BUILD - A.M.)	0	0	0	0	0	0	0	670	0	0	963	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.25%	30.00%	0.00%	0.00%	0.00%	18.47%
Percent Commercial Trips Generated(Exiting)	18.23%	0.00%	30.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	10	0	17	0	0	0	19	19	0	0	0	11
Total AM Peak Hour BUILD Volumes	10	0	17	0	0	0	19	689	0	0	963	11

	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (4th St.)			Southbound (4th St.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	802	0	0	1,284	0
Background Traffic Growth	0	0	0	0	0	0	0	24	0	0	39	0
Subtotal (NO BUILD - P.M.)	0	0	0	0	0	0	0	826	0	0	1,323	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.25%	30.00%	0.00%	0.00%	0.00%	18.47%
Percent Commercial Trips Generated(Exiting)	18.23%	0.00%	30.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	10	0	16	0	0	0	17	17	0	0	0	10
Total PM Peak Hour BUILD Volumes	10	0	16	0	0	0	17	843	0	0	1,323	10

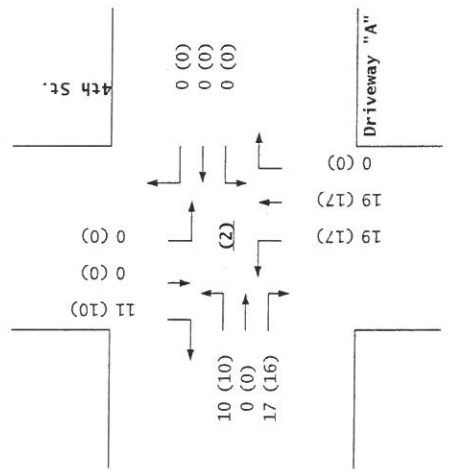
Number of Commercial Trips Generated

Entering	62	57	A.M.	100% Commercial Development
Exiting	55	54	P.M.	

2006
BUILD

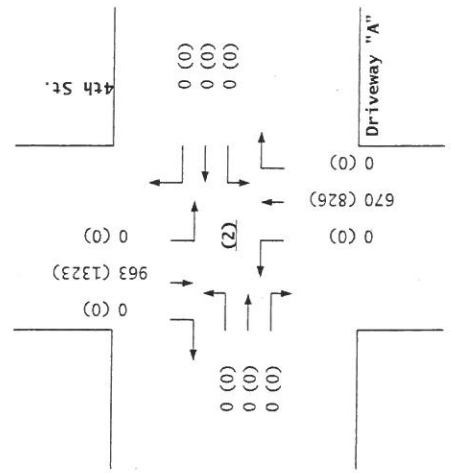


Trips



Driveway "A" / 4th St.

2006
NO BUILD



Starbuck's (Solar / 4th)
Projected Turning Movements Worksheet
Solar Rd. / Driveway "B"

CASE 3 (with Solar Access)

(3)

INTERSECTION:

E-W Street: **Solar Rd.**
N-S Street: **Driveway "B"**

Year of Existing Counts: 2005
Implementation Year: 2006

Growth Rates

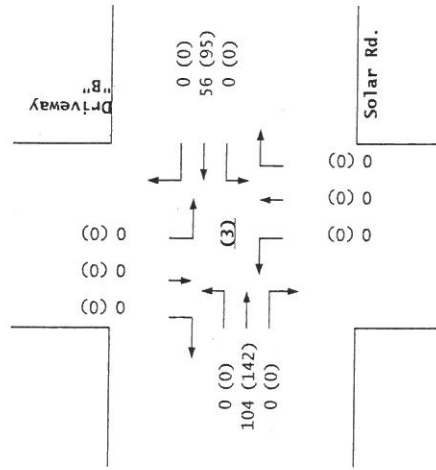
	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	101	0	0	54	0	0	0	0	0	0	0
Background Traffic Growth	0	3	0	0	2	0	0	0	0	0	0	0
Subtotal (NO BUILD - A.M.)	0	104	0	0	56	0	0	0	0	0	0	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	3.28%	48.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	48.36%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	2	30	0	0	2	0	28	0	0	0
Total AM Peak Hour BUILD Volumes	0	104	2	30	56	0	2	0	28	0	0	0

	Eastbound (Solar Rd.)			Westbound (Solar Rd.)			Northbound (Driveway "B")			Southbound (Driveway "B")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	138	0	0	92	0	0	0	0	0	0	0
Background Traffic Growth	0	4	0	0	3	0	0	0	0	0	0	0
Subtotal (NO BUILD - P.M.)	0	142	0	0	95	0	0	0	0	0	0	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	3.28%	48.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	48.36%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	2	26	0	0	2	0	26	0	0	0
Total PM Peak Hour BUILD Volumes	0	142	2	26	95	0	2	0	26	0	0	0

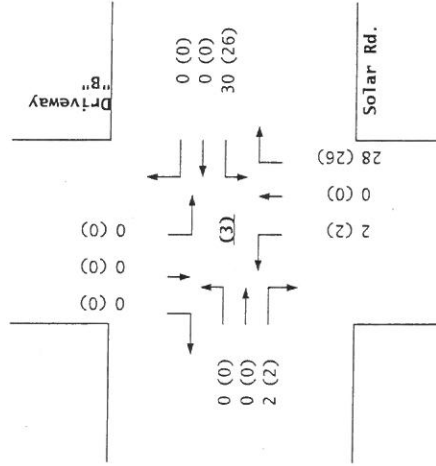
Number of Commercial Trips Generated

Entering	62	57	A.M.	100% Commercial Development
Exiting	55	54	P.M.	

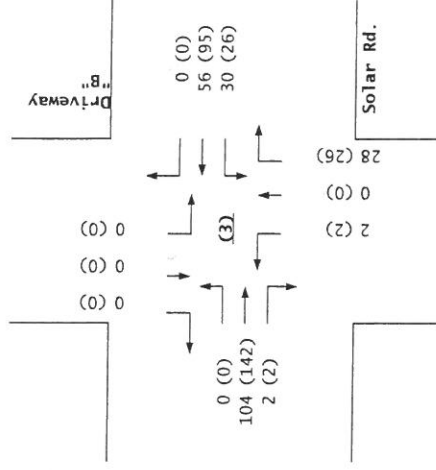
2006
NO BUILD



Trips



2006
BUILD



Solar Rd. / Driveway "B"

CASE 1:

No Access to Solar

Full Access to 4th St.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations	4	4	4	4	4	4
Volume (vph)	41	4	31	4	651	922
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	8	8	2	6
Detected Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	32.0	38.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	35.6%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	7.9	7.9	7.9	7.9	19.5	24.1
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.30	0.37
v/c Ratio	0.26	0.28	0.21	0.04	0.73	0.77
Control Delay	34.9	13.2	34.2	24.4	25.4	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	13.2	34.2	24.4	25.4	22.7
LOS	C	B	C	C	C	C
Approach Delay	21.6		32.1	25.4	22.7	
Approach LOS	C		C	C	C	C
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 64.4						
Natural Cycle: 65						
Control Type: Actuated-Uncoordinated						
Maximum v/c Ratio: 0.77						
Intersection Signal Delay: 23.9						
Intersection Capacity Utilization 64.6%						
Analysis Period (min) 15						
Intersection LOS: C						
ICU Level of Service C						
Splits and Phases: 1: Solar & 4th						
	e2	e6	e4	e8		
	32 s	38 s	20 s	20 s		

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBT
Lane Configurations	4	4	4	4	4	4	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86	1.00	0.92	1.00	0.95	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	1599	1770	1708	3517	3517	3534	3534	3534
Flt Permitted	0.75	1.00	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1400	1599	1323	1708	3517	3517	3534	3534	3534
Volume (vph)	41	4	63	31	4	5	47	651	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	4	68	34	4	5	51	708	16
RTOR Reduction (vph)	0	60	0	4	0	0	0	1	0
Lane Group Flow (vph)	45	12	0	34	5	0	774	0	0
Turn Type	Perm	Perm	Perm	Perm	Split	Split	Split	Split	Split
Protected Phases	4	4	8	8	2	2	6	6	6
Permitted Phases	4	4	8	8	2	2	6	6	6
Actuated Green, G (s)	7.9	7.9	7.9	7.9	19.5	19.5	24.1	24.1	24.1
Effective Green, g (s)	7.9	7.9	7.9	7.9	19.5	19.5	24.1	24.1	24.1
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.31	0.31	0.38	0.38	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	174	199	165	212	1080	1080	1341	1341	1341
v/s Ratio Prot	c0.03	0.01	0.03	0.00	c0.22	c0.22	c0.29	c0.29	c0.29
v/c Ratio	0.26	0.06	0.21	0.02	0.72	0.72	0.76	0.76	0.76
Uniform Delay, d1	25.2	24.5	25.0	24.4	19.5	19.5	17.1	17.1	17.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.6	0.0	2.3	2.3	2.5	2.5	2.5
Delay (s)	25.9	24.7	25.6	24.4	21.8	21.8	19.6	19.6	19.6
Level of Service	C	C	C	C	C	C	B	B	B
Approach Delay (s)	25.2		25.4	25.4	21.8	21.8	19.6	19.6	19.6
Approach LOS	C		C	C	C	C	B	B	B
Intersection Summary									
HCM Average Control Delay	21.0								
HCM Volume to Capacity ratio	0.66								
Actuated Cycle Length (s)	63.5								
Intersection Capacity Utilization	64.6%								
Analysis Period (min)	15								
c Critical Lane Group									

HCM Unsignalized Intersection Capacity Analysis 2: 'A' & 4th

Terry O. Brown, P.E.
12/9/2005

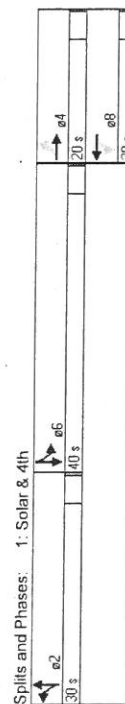
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	23	34	37	670	963	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	37	40	728	1047	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						189
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	1497	529	1059			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	45	749			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	76	95	94			
cM capacity (veh/h)	103	764	644			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	62	283	486	698	361	
Volume Left	25	40	0	0	0	
Volume Right	37	0	0	0	12	
cSH	212	644	1700	1700	1700	
Volume to Capacity	0.29	0.06	0.29	0.41	0.21	
Queue Length 95th (ft)	29	5	0	0	0	
Control Delay (s)	28.8	2.2	0.0	0.0	0.0	
Lane LOS	D	A				
Approach Delay (s)	28.8	0.8		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			56.1%			
Analysis Period (min)			15			
				ICU Level of Service		B

Timings
1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations	47	5	61	16	795	1225
Volume (vph)	Perm	4	4	8	2	6
Turn Type	Protected Phases	4	4	8	2	6
Permitted Phases	Detector Phases	4	4	8	2	6
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.2%	22.2%	22.2%	33.3%	44.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	Min
Act Eff Green (s)	9.8	9.8	9.8	24.8	34.5	
Actuated g/C Ratio	0.12	0.12	0.12	0.31	0.42	
v/c Ratio	0.31	0.39	0.45	0.10	0.88	0.91
Control Delay	38.4	12.3	44.3	28.8	38.9	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	12.3	44.3	28.8	38.9	32.9
LOS	D	B	D	C	D	C
Approach Delay		20.6		40.6	38.9	32.9
Approach LOS		C		D	D	C
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 81.2						
Natural Cycle: 90						
Control Type: Actuated-Uncoordinated						
Maximum v/c Ratio: 0.91						
Intersection Signal Delay: 34.6						
Intersection Capacity Utilization 79.0%						
Analysis Period (min) 15						

Intersection LOS: C
ICU Level of Service D



2005 PM Peak Hour BUILD Conditions
Case 1 - NO Access on Solar, Full Access on 4th
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HCM Signalized Intersection Capacity Analysis

1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBT	SBT
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.86	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	0.95	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	1596	1770	1770	1810	1770	1810	3518	3518	3529	3529	3529
Flt Permitted	0.74	1.00	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1385	1596	1201	1810	3518	3518	3518	3518	3518	3529	3529	3529
Volume (vph)	47	5	96	61	16	4	62	795	15	6	1225	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	5	104	66	17	4	67	864	16	7	1332	23
RTOR Reduction (vph)	0	92	0	0	4	0	0	1	0	0	1	0
Lane Group Flow (vph)	51	17	0	66	17	0	0	946	0	0	1361	0
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Split	Split	Split	Split	Split	Split
Protected Phases	4	4	4	8	8	8	2	2	2	2	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	2	6	6
Actuated Green, G (s)	9.7	9.7	9.7	9.7	9.7	9.7	24.8	24.8	24.8	24.8	34.5	34.5
Effective Green, g (s)	9.7	9.7	9.7	9.7	9.7	9.7	24.8	24.8	24.8	24.8	34.5	34.5
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.31	0.31	0.31	0.31	0.43	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	166	191	144	217	1077	1077	1503	1503	1503	1503	1503	1503
v/s Ratio Prot	0.04	0.01	0.01	0.01	0.01	0.01	c0.27	c0.27	c0.27	c0.27	c0.39	c0.39
v/c Ratio	0.31	0.09	0.09	0.08	0.08	0.08	0.88	0.88	0.88	0.88	0.91	0.91
Uniform Delay, d1	32.6	31.7	33.2	31.7	33.2	31.7	26.7	26.7	26.7	26.7	21.7	21.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	2.3	0.2	2.3	0.2	8.3	8.3	8.3	8.3	8.1	8.1
Delay (s)	33.6	31.9	35.5	31.9	35.5	31.9	34.9	34.9	34.9	34.9	29.8	29.8
Level of Service	C	C	D	C	D	C	C	C	C	C	C	C
Approach Delay (s)	32.5	32.5	34.6	34.6	34.6	34.6	29.8	29.8	29.8	29.8	29.8	29.8
Approach LOS	C	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
HCM Volume to Capacity ratio	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Actuated Cycle Length (s)	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0
Intersection Capacity Utilization	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%	79.0%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

2005 PM Peak Hour BUILD Conditions
Case 1 - NO Access on Solar, Full Access on 4th
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HCM Unsignalized Intersection Capacity Analysis
 2: 'A' & 4th

Terry O. Brown, P.E.
 12/9/2005

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		4↑	4↑	↑	↑
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Volume (veh/h)	21	33	33	826	1323	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	36	36	898	1438	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						189
pX, platoon unblocked	0.64	0.64	0.64			
VC, conflicting volume	1964	724	1449			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1944	0	1134			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	31	95	91			
cM capacity (veh/h)	33	690	369			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	59	335	599	959	490	
Volume Left	23	36	0	0	0	
Volume Right	36	0	0	0	11	
cSH	79	389	1700	1700	1700	
Volume to Capacity	0.75	0.09	0.35	0.56	0.29	
Queue Length 95th (ft)	90	8	0	0	0	
Control Delay (s)	130.2	3.1	0.0	0.0	0.0	
Lane LOS	F	A				
Approach Delay (s)	130.2	1.1		0.0		
Approach LOS	F					

Intersection Summary			
Average Delay	3.6	ICU Level of Service	B
Intersection Capacity Utilization	57.0%		
Analysis Period (min)	15		

Queues
1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	45	72	34	9	775	1015
v/c Ratio	0.26	0.28	0.21	0.04	0.73	0.77
Control Delay	34.9	13.2	34.2	24.4	25.4	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	13.2	34.2	24.4	25.4	22.7
Queue Length 50th (ft)	16	1	12	1	136	171
Queue Length 95th (ft)	54	39	43	15	249	308
Internal Link Dist (ft)		98		128	109	343
Turn Bay Length (ft)	75		90			
Base Capacity (vph)	323	420	305	397	1386	1652
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.17	0.11	0.02	0.56	0.61

Intersection Summary

Queues
1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	51	109	66	21	947	1362
v/c Ratio	0.31	0.39	0.45	0.10	0.88	0.91
Control Delay	38.4	12.3	44.3	28.8	38.9	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	12.3	44.3	28.8	38.9	32.9
Queue Length 50th (ft)	25	2	33	8	244	338
Queue Length 95th (ft)	58	46	72	28	#390	#532
Internal Link Dist (ft)		98		128	109	343
Turn Bay Length (ft)	75		90			
Base Capacity (vph)	255	379	225	337	1116	1544
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.29	0.29	0.06	0.85	0.88

Intersection Summary

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

CASE 2:

Access to Solar

Right-in, right-out Access to 4th St.

Timings 1: Solar & 4th

Terry O. Brown, P.E.
12/6/2005

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations	62	4	31	4	47	47
Volume (vph)	1900	1900	1900	1900	1900	1900
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	8	2	6	6
Permitted Phases	4	4	8	8	2	6
Detector Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	30.0	40.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	33.3%	44.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	Min
Act Eff Green (s)	8.9	8.9	8.9	8.9	19.5	24.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.30	0.38
v/c Ratio	0.36	0.31	0.19	0.04	0.76	0.77
Control Delay	36.3	12.1	33.3	23.8	27.8	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	12.1	33.3	23.8	27.8	23.0
LOS	D	B	C	C	C	C
Approach Delay	22.5		31.3	27.8	23.0	
Approach LOS	C		C	C	C	C
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 66.1						
Natural Cycle: 65						
Control Type: Actuated Uncoordinated						
Maximum v/c Ratio: 0.77						
Intersection Signal Delay: 25.1						
Intersection Capacity Utilization 66.2%						
Analysis Period (min) 15						
Intersection LOS: C						
ICU Level of Service C						
Splits and Phases: 1: Solar & 4th						
	30 s	40 s	20 s	20 s	20 s	20 s
	e2	e6	e4	e8		

2006 AM Peak Hour BUILD Conditions
Case 2 - Access on Solar, Right-in, right-out on 4th
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HCM Signalized Intersection Capacity Analysis 1: Solar & 4th

Terry O. Brown, P.E.
12/6/2005

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBT
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	8	2	6	6			
Actuated Green, G (s)	8.9	8.9	8.9	8.9	19.5	24.7			
Effective Green, g (s)	8.9	8.9	8.9	8.9	19.5	24.7			
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.30	0.38			
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	191	218	178	234	1051	1339			
v/s Ratio Prot	0.01				0.22	0.29			
v/c Ratio	0.35	0.07	0.19	0.02	0.75	0.76			
Uniform Delay, d1	25.5	24.5	24.9	24.3	20.6	17.6			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.1	0.1	0.5	0.0	3.1	2.5			
Delay (s)	26.6	24.6	25.4	24.4	23.7	20.1			
Level of Service	C	C	C	C	C	C			
Approach Delay (s)	25.5		25.2		23.7	20.1			
Approach LOS	C		C		C	C			
Intersection Summary									
HCM Average Control Delay	22.0								
HCM Volume to Capacity ratio	0.69								
Actuated Cycle Length (s)	65.1								
Intersection Capacity Utilization	66.2%								
Analysis Period (min)	15								
c Critical Lane Group									

2006 AM Peak Hour BUILD Conditions
Case 2 - Access on Solar, Right-in, right-out on 4th
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HCM Unsignalized Intersection Capacity Analysis

2: 'A' & 4th

Terry O. Brown, P.E.
12/6/2005

Movement	EBL	EBR	NBL	NBT	SBL	SBR
Lane Configurations	EBL	EBR	NBL	NBT	SBL	SBR
Sign Control	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	0	17	0	707	963	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	0	768	1047	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						189
Upstream signal (ft)						
pX, platoon unblocked						
VC, conflicting volume	0.75	0.75	0.75	0.75	0.75	0.75
VC1, stage 1 conf vol	1437	529	1059			
VC2, stage 2 conf vol						
vCu, unblocked vol	1253	48	751			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
p0 queue free (s)	100	98	100			
cM capacity (veh/h)	124	761	644			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	18	256	512	698	361	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	12	
cSH	761	644	1700	1700	1700	
Volume to Capacity	0.02	0.00	0.30	0.41	0.21	
Queue Length 95th (ft)	2	0	0	0	0	
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	
Lane LOS	A	A	A	A	A	
Approach Delay (s)	9.8	0.0	0.0			
Approach LOS	A	A				
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	37.0%					
Analysis Period (min)	15					
ICU Level of Service	A					

2006 AM Peak Hour BUILD Conditions

Case 2 - Access on Solar, Right-in, right-out on 4th
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HCM Unsignalized Intersection Capacity Analysis

3: Solar & 'B'

Terry O. Brown, P.E.
12/6/2005

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EBT	EBR	WBL	WBT	NBL	NBR
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	104	2	49	56	2	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	113	2	53	61	2	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						None
Median storage (veh)						
Upstream signal (ft)						178
pX, platoon unblocked						
VC, conflicting volume			115		282	114
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
vCu, unblocked vol			115		282	114
IC, single (s)			4.1		6.4	6.2
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			96		100	96
cM capacity (veh/h)			1474		683	938
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	115	114	43			
Volume Left	0	53	2			
Volume Right	2	0	41			
cSH	1700	1474	921			
Volume to Capacity	0.07	0.04	0.05			
Queue Length 95th (ft)	0	3	4			
Control Delay (s)	0.0	3.7	9.1			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	3.7	9.1			
Approach LOS	A	A				
Intersection Summary						
Average Delay	3.0					
Intersection Capacity Utilization	22.3%					
Analysis Period (min)	15					
ICU Level of Service	A					

2006 AM Peak Hour BUILD Conditions

Case 2 - Access on Solar, Right-in, right-out on 4th
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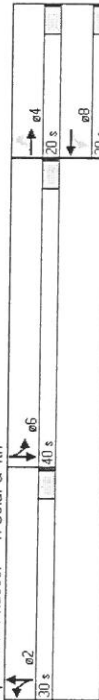
Timings 1: Solar & 4th

Terry O. Brown, P.E.
12/6/2005

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations	EBL	EBT	WBL	WBT	NBT	SBT
Volume (vph)	67	5	61	16	775	1215
Turn Type	Perm	5	Perm	8	2	6
Protected Phases	4	4	8	8	2	6
Detector Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	30.0	40.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	33.3%	44.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	10.1	10.1	10.1	10.1	25.0	34.7
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.31	0.42
v/c Ratio	0.43	0.41	0.47	0.09	0.89	0.91
Control Delay	41.8	11.9	45.4	28.5	40.1	33.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	11.9	45.4	28.5	40.1	33.8
LOS	D	B	D	C	D	C
Approach Delay	22.9		41.3	40.1	33.8	
Approach LOS	C		D	D	C	
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 81.9						
Natural Cycle: 90						
Control Type: Actuated-Uncoordinated						
Maximum v/c Ratio: 0.91						
Intersection Signal Delay: 35.5						
Intersection Capacity Utilization 79.7%						
Analysis Period (min) 15						

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 1: Solar & 4th



2006 PM Peak Hour BUILD Conditions

Case 2 - Access on Solar, Right-in, right-out on 4th
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HCM Signalized Intersection Capacity Analysis

1: Solar & 4th
Terry O. Brown, P.E.
12/6/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.86	1.00	0.97	1.00	0.95	1.00	0.99	1.00	0.95	0.95
Satd. Flow (prot)	1770	1595	1770	1770	1810	1770	1770	1810	3512	3512	3525	3525
Flt Permitted	0.74	1.00	0.59	1.00	0.99	1.00	0.99	1.00	0.99	1.00	0.99	1.00
Satd. Flow (perm)	1385	1595	1092	1092	1810	1092	1092	1810	3512	3512	3525	3525
Volume (vph)	67	5	110	61	16	4	93	775	15	6	1215	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	5	120	66	17	4	101	842	16	7	1321	34
RTOR Reduction (vph)	0	105	0	0	4	0	0	1	0	0	2	0
Lane Group Flow (vph)	73	20	0	66	17	0	0	956	0	0	1360	0
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Split	Split	Split	Split	Split	Split
Protected Phases	4	4	8	8	8	8	2	2	2	2	6	6
Permitted Phases	4	4	8	8	8	8	2	2	2	2	6	6
Actuated Green, G (s)	10.1	10.1	10.1	10.1	10.1	10.1	25.0	25.0	25.0	25.0	34.7	34.7
Effective Green, g (s)	10.1	10.1	10.1	10.1	10.1	10.1	25.0	25.0	25.0	25.0	34.7	34.7
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.31	0.31	0.31	0.31	0.42	0.42
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	171	197	135	223	1073	1495	c0.39	c0.39	c0.39	c0.39	c0.39	c0.39
v/s Ratio Prot	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
v/c Ratio	0.43	0.10	0.49	0.08	0.89	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Uniform Delay, d1	33.2	31.8	33.4	31.7	27.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.2	2.8	0.2	9.6	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Delay (s)	34.9	32.0	36.2	31.9	36.7	30.5	30.5	30.5	30.5	30.5	30.5	30.5
Level of Service	C	C	D	C	D	C	C	C	C	C	C	C
Approach Delay (s)	33.1		35.2	35.2	36.7	30.5	30.5	30.5	30.5	30.5	30.5	30.5
Approach LOS	C		D	D	D	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	33.1		33.1	33.1	36.7	30.5	30.5	30.5	30.5	30.5	30.5	30.5
HCM Volume to Capacity ratio	0.84		0.84	0.84	0.89	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Actuated Cycle Length (s)	81.8		81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8
Intersection Capacity Utilization	79.7%		79.7%	79.7%	79.7%	79.7%	79.7%	79.7%	79.7%	79.7%	79.7%	79.7%
Analysis Period (min)	15		15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

2006 PM Peak Hour BUILD Conditions

Case 2 - Access on Solar, Right-in, right-out on 4th
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HCM Unsignalized Intersection Capacity Analysis 2: 'A' & 4th Terry O. Brown, P.E. 12/6/2005

Movement	EBL	EBR	NBL	NBT	SBT	EBR	SBR
Lane Configurations	W	W	W	W	W	W	W
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	0	16	0	859	1323	10	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	17	0	934	1438	11	11
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type							
Median storage (veh)							
Upstream signal (ft)							189
pX, platoon unblocked							
VC, conflicting volume	0.64	0.64	0.64				
VC1, stage 1 conf vol	1910	724	1449				
VC2, stage 2 conf vol							
VCU, unblocked vol	1859	0	1133				
IC, single (s)	6.8	6.9	4.1				
IC, 2 stage (s)							
IF (s)	3.5	3.3	2.2				
p0 queue free %	100	97	100				
cM capacity (veh/h)	41	689	389				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	17	311	622	959	490		
Volume Left	0	0	0	0	0		
Volume Right	17	0	0	0	11		
cSH	689	389	1700	1700	1700		
Volume to Capacity	0.03	0.00	0.37	0.56	0.29		
Queue Length 95th (ft)	2	0	0	0	0		
Control Delay (s)	10.4	0.0	0.0	0.0	0.0		
Lane LOS	B						
Approach Delay (s)	10.4	0.0	0.0				
Approach LOS	B						
Intersection Summary							
Average Delay				0.1			
Intersection Capacity Utilization				46.9%			
Analysis Period (min)				15			
ICU Level of Service				A			

2006 PM Peak Hour BUILD Conditions

Case 2 - Access on Solar, Right-in, right-out on 4th

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HCM Unsignalized Intersection Capacity Analysis 3: Solar & 'B' Terry O. Brown, P.E. 12/6/2005

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	W	W	W	W	W	W
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	142	2	43	95	2	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	2	47	103	2	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						178
pX, platoon unblocked						
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol						
IC, single (s)						
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %					97	100
cM capacity (veh/h)					624	890
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	157	150	41			
Volume Left	0	47	2			
Volume Right	2	0	39			
cSH	1700	1423	871			
Volume to Capacity	0.09	0.03	0.05			
Queue Length 95th (ft)	0	3	4			
Control Delay (s)	0.0	2.6	9.3			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	2.6	9.3			
Approach LOS	A		A			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			28.3%			
Analysis Period (min)			15			
ICU Level of Service			A			

2006 PM Peak Hour BUILD Conditions

Case 2 - Access on Solar, Right-in, right-out on 4th

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Queues
1: Solar & 4th

Terry O. Brown, P.E.
12/7/2005



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	67	89	34	9	790	1014
v/c Ratio	0.36	0.31	0.19	0.04	0.76	0.77
Control Delay	36.3	12.1	33.3	23.8	27.8	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	12.1	33.3	23.8	27.8	23.0
Queue Length 50th (ft)	25	1	13	1	146	181
Queue Length 95th (ft)	72	42	44	15	274	307
Internal Link Dist (ft)		98		128	109	343
Turn Bay Length (ft)	75		90			
Base Capacity (vph)	320	430	297	394	1294	1678
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.11	0.02	0.61	0.60

Intersection Summary

Queues
1: Solar & 4th

Terry O. Brown, P.E.
12/7/2005



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	73	125	66	21	959	1362
v/c Ratio	0.43	0.41	0.47	0.09	0.89	0.91
Control Delay	41.8	11.9	45.4	28.5	40.1	33.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	11.9	45.4	28.5	40.1	33.8
Queue Length 50th (ft)	36	2	33	8	251	341
Queue Length 95th (ft)	77	49	73	28	#403	#541
Internal Link Dist (ft)		98		128	109	343
Turn Bay Length (ft)	75		90			
Base Capacity (vph)	254	390	209	335	1108	1531
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.32	0.32	0.06	0.87	0.89

Intersection Summary

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

CASE 3:

Access to Solar

Full Access to 4th St.

Timings
1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations	51	4	31	4	640	910
Volume (vph)	Perm	4	Perm	4	4	4
Turn Type	Perm	4	Perm	4	4	4
Protected Phases	4	4	8	2	2	6
Permitted Phases	4	4	8	2	2	6
Detector Phases	4	4	8	2	2	6
Minimum Initial (s)	20.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	35.6%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	8.4	8.4	8.4	8.4	19.7	24.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.30	0.37
v/c Ratio	0.31	0.32	0.20	0.04	0.74	0.77
Control Delay	35.6	12.5	33.9	24.1	26.1	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	12.5	33.9	24.1	26.1	23.3
LOS	D	B	C	C	C	C
Approach Delay	21.3	31.9	26.1	23.3		
Approach LOS	C	C	C	C		
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 65.3						
Natural Cycle: 65						
Control Type: Actuated-Uncoordinated						
Maximum v/c Ratio: 0.77						
Intersection Signal Delay: 24.4						
Intersection Capacity Utilization 65.4%						
Analysis Period (min) 15						
Intersection LOS: C						
ICU Level of Service C						
Splits and Phases: 1: Solar & 4th						
	e2	e6	e4	e8		
	32 s	36 s	20 s	20 s		

2006 AM Peak Hour BUILD Conditions
Case 3 - Access on Solar; Full Access on 4th
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HCM Signalized Intersection Capacity Analysis

1: Solar & 4th
Terry O. Brown, P.E.
12/9/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.86	1.00	1.00	0.92	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1596	1770	1708	3513	3528	3513	3528	3513	3528	3513	3528
Flt Permitted	0.75	1.00	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1400	1596	1303	1708	3513	3528	3513	3528	3513	3528	3513	3528
Volume (vph)	51	4	78	31	4	5	64	640	15	4	910	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	4	85	34	4	5	70	696	16	4	989	21
RTOR Reduction (vph)	0	74	0	0	4	0	0	1	0	0	2	0
Lane Group Flow (vph)	55	15	0	34	5	0	0	781	0	0	1012	0
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Split	Split	Split	Split	Split	Split
Protected Phases	4	4	8	8	8	8	2	2	2	2	6	6
Permitted Phases	4	4	8	8	8	8	2	2	2	2	6	6
Actuated Green, G (s)	8.4	8.4	8.4	8.4	8.4	8.4	19.7	19.7	19.7	19.7	24.3	24.3
Effective Green, g (s)	8.4	8.4	8.4	8.4	8.4	8.4	19.7	19.7	19.7	19.7	24.3	24.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.31	0.31	0.31	0.31	0.38	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	183	208	170	223	1075	1331	c0.29	c0.29	c0.29	c0.29	c0.29	c0.29
v/s Ratio Prot	c0.04	0.01	0.03	0.03	0.03	0.03	0.73	0.73	0.73	0.73	0.76	0.76
v/c Ratio	0.30	0.07	0.20	0.02	0.02	0.02	19.9	19.9	19.9	19.9	17.5	17.5
Uniform Delay, d1	25.3	24.6	25.0	24.4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	0.6	0.0	0.0	0.0	2.5	2.5	2.5	2.5	2.6	2.6
Delay (s)	26.3	24.7	25.6	24.5	22.4	22.4	20.1	20.1	20.1	20.1	20.1	20.1
Level of Service	C	C	C	C	C	C	C	C	C	C	C	C
Approach Delay (s)	25.3	25.3	25.3	25.3	25.3	25.3	22.4	22.4	22.4	22.4	20.1	20.1
Approach LOS	C	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	21.5	21.5	21.5	21.5	21.5	21.5	HCM Level of Service	C	C	C	C	C
HCM Volume to Capacity ratio	0.67	0.67	0.67	0.67	0.67	0.67	Sum of lost time (s)	12.0	12.0	12.0	12.0	12.0
Actuated Cycle Length (s)	64.4	64.4	64.4	64.4	64.4	64.4	ICU Level of Service	C	C	C	C	C
Intersection Capacity Utilization	65.4%	65.4%	65.4%	65.4%	65.4%	65.4%	Analysis Period (min)	15	15	15	15	15
Analysis Period (min)	15	15	15	15	15	15	c Critical Lane Group					

2006 AM Peak Hour BUILD Conditions
Case 3 - Access on Solar; Full Access on 4th
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HCM Unsignalized Intersection Capacity Analysis

2: 'A' & 4th

Terry O. Brown, P.E.
12/9/2005

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W	W	W	W	W	W
Sign Control	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	10	17	19	689	963	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	18	21	749	1047	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						189
pX, platoon unblocked						
VC, conflicting volume	0.75	0.75	0.75			
VC1, stage 1 conf vol	1468	529	1059			
VC2, stage 2 conf vol						
VCu, unblocked vol	1294	46	749			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
p0 queue free (veh)	90	98	97			
cM capacity (veh/h)	112	763	644			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	29	270	499	698	361	
Volume Left	11	21	0	0	0	
Volume Right	18	0	0	0	12	
cSH	243	644	1700	1700	1700	
Volume to Capacity	0.12	0.03	0.29	0.41	0.21	
Queue Length 95th (ft)	10	2	0	0	0	
Control Delay (s)	21.9	1.2	0.0	0.0	0.0	
Lane LOS	C	A				
Approach Delay (s)	21.9	0.4				
Approach LOS	C					
Intersection Summary						
Average Delay				0.5		
Intersection Capacity Utilization				42.7%		
Analysis Period (min)				15		
						ICU Level of Service
						A

2006 AM Peak Hour BUILD Conditions

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Case 3 - Access on Solar, Full Access on 4th

HCM Unsignalized Intersection Capacity Analysis

3: Solar & 'B'

Terry O. Brown, P.E.
12/9/2005

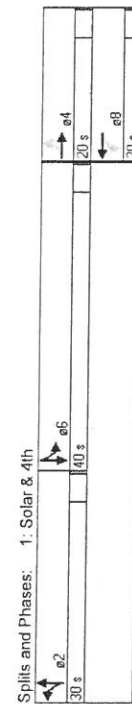
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Volume (veh/h)	104	2	30	56	2	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	113	2	33	61	2	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
VC, conflicting volume			115		240	114
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol						
IC, single (s)						
IC, 2 stage (s)						
p0 queue free %			2.2		3.5	3.3
p0 queue free (veh)			98		100	97
cM capacity (veh/h)			1474		732	938
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	115	93	33			
Volume Left	0	33	2			
Volume Right	2	0	30			
cSH	1700	1474	921			
Volume to Capacity	0.07	0.02	0.04			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	2.7	9.1			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	2.7	9.1			
Approach LOS	A					
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			21.3%			
Analysis Period (min)			15			
						ICU Level of Service
						A

2006 AM Peak Hour BUILD Conditions

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Case 3 - Access on Solar, Full Access on 4th

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations	57	5	61	16	785	1215
Volume (vph)	Perm	5	Perm	16	785	1215
Turn Type						
Protected Phases	4	4	8	8	2	6
Permitted Phases	4	4	8	8	2	6
Detector Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	30.0	40.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	33.3%	44.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	Min
Act Eff Green (s)	10.1	10.1	10.1	10.1	24.9	34.6
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.30	0.42
v/c Ratio	0.36	0.41	0.47	0.09	0.89	0.91
Control Delay	39.7	11.8	45.4	28.5	39.7	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	11.8	45.4	28.5	39.7	33.7
LOS	D	B	D	C	D	C
Approach Delay	21.1		41.3	39.7	33.7	
Approach LOS	C		D	D	D	C
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 81.7						
Natural Cycle: 90						
Control Type: Actuated-Uncoordinated						
Maximum v/c Ratio: 0.91						
Intersection Signal Delay: 35.3						
Intersection Capacity Utilization 79.2%						
Analysis Period (min) 15						
Intersection LOS: D						
ICU Level of Service D						



Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBT
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.86	1.00	0.97	1.00	0.95	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	1595	1770	1810	3515	3515	3515	3515	3515
Flt Permitted	0.74	1.00	0.59	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1385	1595	1094	1810	3515	3515	3515	3515	3515
Volume (vph)	57	5	110	61	16	4	77	785	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	5	120	66	17	4	84	853	16
RTOR Reduction (vph)	0	105	0	4	0	0	0	1	0
Lane Group Flow (vph)	62	20	0	66	17	0	0	952	0
Turn Type	Perm	Perm	Perm	Perm	Split	Split	Split	Split	Split
Protected Phases	4	4	8	8	2	2	6	6	6
Permitted Phases	4	4	8	8	2	2	6	6	6
Actuated Green, G (s)	10.1	10.1	10.1	10.1	10.1	10.1	24.9	24.9	34.6
Effective Green, g (s)	10.1	10.1	10.1	10.1	10.1	10.1	24.9	24.9	34.6
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.31	0.31	0.42
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	171	197	135	224	1073	1073	1495	1495	1495
v/s Ratio Prot	0.04	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01
v/c Ratio Perm	0.36	0.10	0.49	0.08	0.89	0.89	0.91	0.91	0.91
Uniform Delay, d1	32.8	31.7	33.3	31.6	27.0	27.0	22.0	22.0	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	2.8	0.1	9.0	9.0	8.5	8.5	8.5
Delay (s)	34.1	31.9	36.1	31.8	36.0	36.0	30.5	30.5	30.5
Level of Service	C	C	D	C	D	D	C	C	C
Approach Delay (s)	32.7		35.1	35.1	36.0	36.0	30.5	30.5	30.5
Approach LOS	C		D	D	D	D	C	C	C
Intersection Summary									
HCM Average Control Delay	32.8								
HCM Volume to Capacity ratio	0.84								
Actuated Cycle Length (s)	81.6								
Intersection Capacity Utilization	79.2%								
Analysis Period (min)	15								
c Critical Lane Group									

HCM Unsignalized Intersection Capacity Analysis 2: 'A' & 4th

Terry O. Brown, P.E.
12/9/2005

Movement	EBL	EBR	NBL	NBT	SBT	SEB
Lane Configurations	W			W	W	W
Sign Control	Stop			Free	Free	Free
Grade	0%			0%	0%	0%
Volume (veh/h)	10	16	17	843	1323	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	17	18	916	1438	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						189
pX, platoon unblocked	0.64	0.64	0.64			
VC, conflicting volume	1939	724	1449			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
vCu, unblocked vol	1903	0	1133			
IC, single (s)	6.8	6.9	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	70	97	95			
cM capacity (veh/h)	37	689	389			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	28	324	611	959	490	
Volume Left	11	18	0	0	0	
Volume Right	17	0	0	0	11	
cSH	88	389	1700	1700	1700	
Volume to Capacity	0.32	0.05	0.36	0.56	0.29	
Queue Length 95th (ft)	31	4	0	0	0	
Control Delay (s)	64.3	1.6	0.0	0.0	0.0	
Lane LOS	F	A	A	A	A	
Approach Delay (s)	64.3	0.5				
Approach LOS	F					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			46.9%			
Analysis Period (min)			15			
ICU Level of Service			A			

2006 PM Peak Hour BUILD Conditions
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Case 3 - Access on Solar, Full Access on 4th

HCM Unsignalized Intersection Capacity Analysis 3: Solar & B'

Terry O. Brown, P.E.
12/9/2005

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	W			W	W	W
Sign Control	Free			Free	Stop	Stop
Grade	0%			0%	0%	0%
Volume (veh/h)	142	2	26	95	2	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	2	28	103	2	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						None
Median storage (veh)						
Upstream signal (ft)						178
pX, platoon unblocked						
VC, conflicting volume			157		315	155
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
vCu, unblocked vol			157		315	155
IC, single (s)			4.1		6.4	6.2
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			98		100	97
cM capacity (veh/h)			1423		664	890
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	157	132	30			
Volume Left	0	28	2			
Volume Right	2	0	28			
cSH	1700	1423	869			
Volume to Capacity	0.09	0.02	0.04			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	1.8	9.3			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	1.8	9.3			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			27.4%			
Analysis Period (min)			15			
ICU Level of Service			A			

2006 PM Peak Hour BUILD Conditions
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Case 3 - Access on Solar, Full Access on 4th

Queues
1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	55	89	34	9	782	1014
v/c Ratio	0.31	0.32	0.20	0.04	0.74	0.77
Control Delay	35.6	12.5	33.9	24.1	26.1	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	12.5	33.9	24.1	26.1	23.3
Queue Length 50th (ft)	20	1	12	1	140	175
Queue Length 95th (ft)	62	42	44	15	256	314
Internal Link Dist (ft)		98		128	109	343
Turn Bay Length (ft)	75		90			
Base Capacity (vph)	321	431	298	395	1373	1635
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.11	0.02	0.57	0.62

Intersection Summary

Queues
1: Solar & 4th

Terry O. Brown, P.E.
12/9/2005



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	62	125	66	21	953	1362
v/c Ratio	0.36	0.41	0.47	0.09	0.89	0.91
Control Delay	39.7	11.8	45.4	28.5	39.7	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	11.8	45.4	28.5	39.7	33.7
Queue Length 50th (ft)	31	2	33	8	248	341
Queue Length 95th (ft)	68	49	73	28	#399	#541
Internal Link Dist (ft)		98		128	109	343
Turn Bay Length (ft)	75		90			
Base Capacity (vph)	254	391	210	336	1110	1533
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.32	0.31	0.06	0.86	0.89

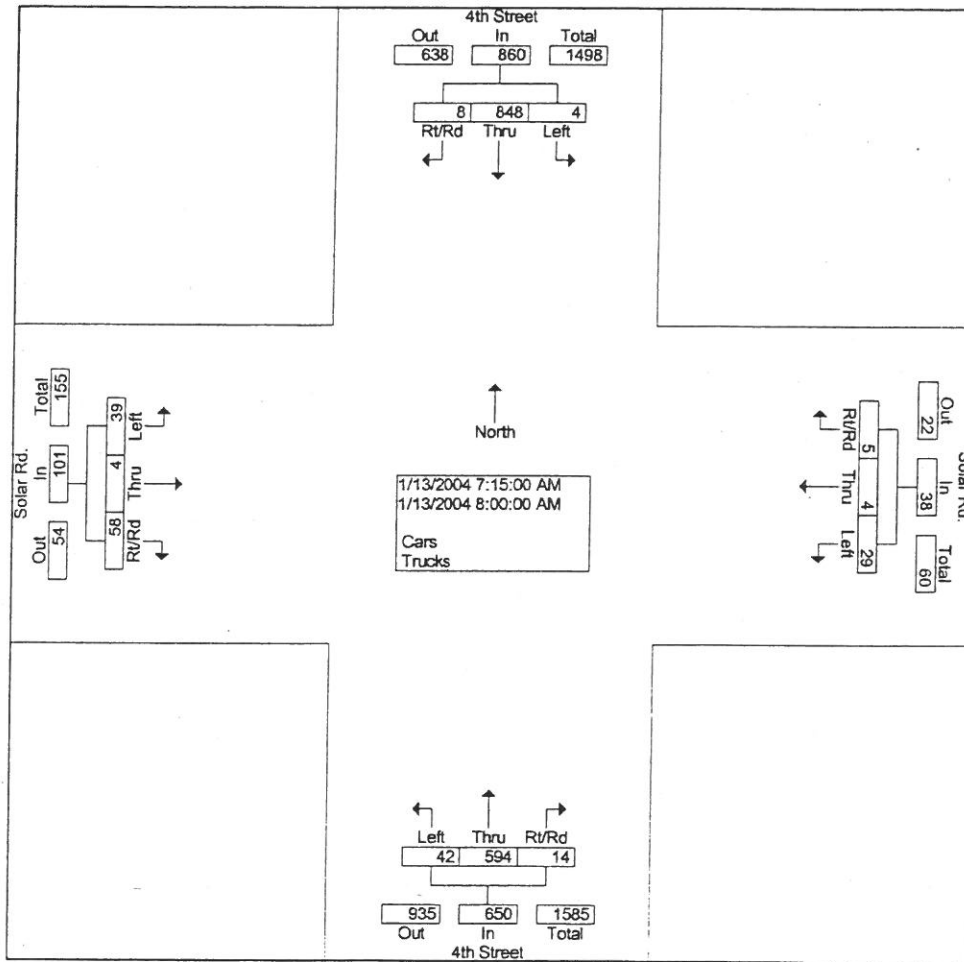
Intersection Summary

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

Mid-Region Council of Governments
Intersection Turning Movement Analysis

File Name : Solar Rd. and 4th St.
Site Code : 00025420
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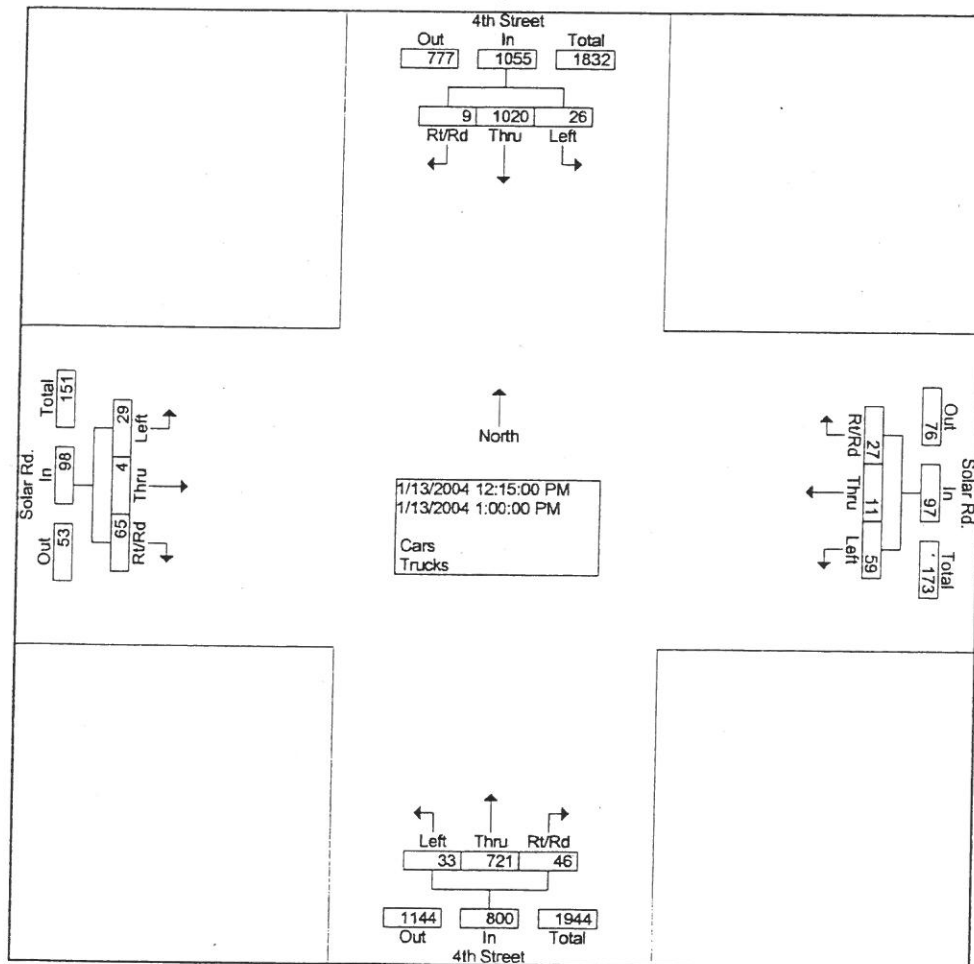
	4th Street From North					Solar Rd. From East					4th Street From South					Solar Rd. From West					
Start Time	Left	Thru	Right	Rt/R d	App. Total	Left	Thru	Right	Rt/R d	App. Total	Left	Thru	Right	Rt/R d	App. Total	Left	Thru	Right	Rt/R d	App. Total	Int. Total
Peak Hour From 06:45 to 09:30 - Peak 1 of 1																					
Intersection 07:15																					
Volume	4	848	7	1	860	29	4	5	0	38	42	594	11	3	650	39	4	54	4	101	1649
Percent	0.5	98.6	0.8	0.1		75.3	10.5	13.2	0.0		6.5	91.4	1.7	0.5		38.6	4.0	53.5	4.0		
Volume	4	848	7	1	860	29	4	5	0	38	42	594	11	3	650	39	4	54	4	101	1649
Volume	1	242	1	0	244	5	2	0	0	7	12	168	5	0	185	10	1	22	0	33	469
Peak Factor																					0.879
High Int. 08:00						07:45					08:00					08:00					
Volume	1	242	1	0	244	14	0	3	0	17	12	168	5	0	185	10	1	22	0	33	
Peak Factor					0.881					0.559					0.878					0.765	



Mid-Region Council of Governments
Intersection Turning Movement Analysis

File Name : Solar Rd. and 4th St.
Site Code : 00025420
Start Date : 01/13/2004
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	4th Street From North					Solar Rd. From East					4th Street From South					Solar Rd. From West					
Start Time	Left	Thru	Right	Rt/R d	App. Total	Left	Thru	Right	Rt/R d	App. Total	Left	Thru	Right	Rt/R d	App. Total	Left	Thru	Right	Rt/R d	App. Total	Int. Total
Peak Hour From 11:00 to 13:45 - Peak 1 of 1																					
Intersection	12:15																				
Volume	26	1020	9	0	1055	59	11	22	5	97	33	721	45	1	800	29	4	61	4	98	2050
Percent	2.5	96.7	0.9	0.0		60.8	11.3	22.7	5.2		4.1	90.1	5.6	0.1		29.6	4.1	62.2	4.1		
Volume	26	1020	9	0	1055	59	11	22	5	97	33	721	45	1	800	29	4	61	4	98	2050
Volume	9	290	5	0	304	11	7	1	3	22	11	186	8	0	205	10	0	15	0	25	556
Peak Factor																					0.922
High Int.	12:30					12:15					12:45					13:00					
Volume	9	290	5	0	304	19	1	7	2	29	6	190	15	0	211	7	0	22	2	31	
Peak Factor	0.868					0.836					0.948					0.790					



Mid-Region Council of Governments
Intersection Turning Movement Analysis

File Name : Solar Rd. and 4th St.
Site Code : 00025420
Start Date : 01/13/2004
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Start Time	4th Street From North					Solar Rd. From East					4th Street From South					Solar Rd. From West					Int. Total
	Left	Thru	Right	Rt/Rd	App. Total	Left	Thru	Right	Rt/Rd	App. Total	Left	Thru	Right	Rt/Rd	App. Total	Left	Thru	Right	Rt/Rd	App. Total	
Peak Hour From 15:00 to 17:45 - Peak 1 of 1																					
Intersection 15:00																					
Volume	6	1137	20	0	1163	58	15	3	1	77	57	731	14	0	802	44	5	87	2	138	2180
Percent	0.5	97.8	1.7	0.0		75.3	19.5	3.9	1.3		7.1	91.1	1.7	0.0		31.9	3.6	63.0	1.4		
Volume	6	1137	20	0	1163	58	15	3	1	77	57	731	14	0	802	44	5	87	2	138	2180
Volume	1	346	6	0	353	13	3	1	0	17	10	196	3	0	209	10	1	11	0	22	601
Peak Factor																					0.907
High Int. Volume	15:00					15:30					15:45					15:45					
Volume	1	346	6	0	353	17	7	0	0	24	10	208	4	0	222	23	3	49	1	76	
Peak Factor					0.824					0.802					0.903					0.454	

