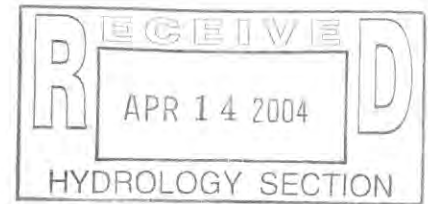


April 13, 2004

Mr. Wilfred Gallegos
City of Albuquerque
Transportation Development
P.O. Box 1293
Albuquerque, NM 87103

Re: Off-Site Mitigation Recommendations for Sundoro Subdivision
Ladera & 98th, Albuquerque, NM



Dear Wilfred:

The following is a report on the proportion of traffic at Ladera and Unser attributable to the proposed Sundoro subdivision (north and south) and recommendations for the improvements to be constructed to address the impact from the development.

BACKGROUND

The traffic impact analysis submitted for the project, *Petroglyphs Master Plan Sundoro Development Traffic Impact Study*, identified that the Ladera and Unser intersection operates at extremely poor levels of service under all conditions evaluated (existing conditions, 2005 no-build and 2005 build). The study also found that incremental improvements were possible to improve the operation under existing conditions. These improvements consist of a third westbound left turn lane and a second eastbound right turn lane.

The study also found, primarily due to high levels of existing westbound left turning traffic, that a traffic signal will be close to being warranted for the 98th Street and I-40 westbound off-ramp intersection under the build condition.

It should also be noted that the Unser and Ladera intersection is planned as a grade separated interchange per the Long Range Roadway System developed by the Mid-Region Council of Governments.

METHODOLOGY

The traffic volumes from the traffic study were used to determine the percent increase in traffic levels at the Unser and Ladera intersection for each movement, approach and total intersection for both the AM and PM peak hours. As City and NMDOT staff did not agree with the assumptions made in the traffic study for the diversion of existing traffic to the 98th Street interchange with I-40, the trip assignment was modified for this analysis. This analysis assumes that no existing traffic, or that anticipated from other approved developments in the area, diverts to the 98th Street interchange. Only Sundoro development traffic desiring to cross the river was assumed to use the 98th Street interchange. A spreadsheet showing these percentages is included in the Enclosure.

Mr. Wilfred Gallegos
City of Albuquerque
March 13, 2004
Page 2

An engineer's opinion of probable construction costs was developed for the entire set of improvements that were reasonably expected to be constructed at the intersection. These improvements were an additional southbound through lane, a second eastbound right turn lane and a third westbound left turn lane. Although these improvements do not result in LOS D for the intersection in any scenario, they result in a substantial improvement in performance over existing conditions. The total construction cost estimate for these improvements is estimated to be \$373,650.00.

As the overall impact to the intersection from the development is relatively minor, these improvements were broken into two projects that may be able to be constructed with the available mitigation monies from the project. Separate engineer's opinion of probable construction costs for constructing the eastbound right turn lane and the westbound left turn lane respectively are also included in the Enclosure.

MITIGATION COST DEVELOPMENT

As the two critical movements to/from the site via the Unser and Ladera intersection are the northbound left and the eastbound right, these movements were used to develop the proportional responsibility for off-site improvements. It can be seen from the spreadsheet in the Enclosure that in the worst-case, the PM peak hour, that proportion of traffic from the development for these movements are 5.0% and 4.6%, respectively, or an average of 4.8%. Applying this 4.8% impact to the intersection improvement cost of \$373,650.00 results in an off-site improvement mitigation contribution of \$18,000.00. This contribution will be in addition to the bonding for the future traffic signal at the 98th Street and I-40 westbound off-ramp intersection.

The interim improvement cost estimate for the third westbound left turn lane is \$148,699.16 and for the eastbound right turn lane is \$43,147.67. These construction cost estimates are included in the Enclosure.

It should also be noted, that although the amount of beneficial impact resulting to the Ladera & Unser intersection from the extension of Ladera to the 98th Street interchange is unknown, I still believe that the construction of this connection will divert existing traffic from the Ladera & Unser intersection to the 98th Street interchange. This diversion of traffic should result in slightly improved operation of the Ladera & Unser intersection.

CONCLUSIONS AND RECOMMENDATIONS

As the costs to construct either of the improvements are significantly beyond the \$18,000.00 impact identified for the intersection, it is recommended that the developer simply provide the City with an \$18,000.00 contribution, to be used as the City deems appropriate to improve the transportation system in the area. As mentioned previously, this contribution is in addition to the bonding for the future traffic signal at the 98th Street and I-40 westbound off-ramp intersection.

If you have any questions regarding this submittal, please call me at (505) 798-7859.

Sincerely,



Eric J. Wrage, P.E., P.T.O.E.
Traffic & Transportation

EJW/ras

Enclosures

cc: Fred Ambrogi, Westland Development (w/encls.)
Kevin Patton, BHI (w/encls.)
Mir Amiri, District 3 NMDOT (w/encls.)

Bohannon  **Huston** INC.

Proportion of Traffic at Ladera and Unser Attributable to Sundoro
 (No Diversion of Existing Traffic to 98th Street Interchange - Only Site Traffic uses 98th Street Interchange)

INTERSECTION: Ladera and Unser

AM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	79	2,355	15	694	92	38	91	322	272	38	109	516
2005 No Build	85	2,679	16	747	99	41	161	390	292	41	117	749
2005 Build	85	2,679	26	747	111	41	168	390	292	69	154	768
Difference	0	0	10	0	12	0	7	0	0	28	37	19
Percent												
Movement	0.0%	0.0%	62.5%	0.0%	12.1%	0.0%	4.3%	0.0%	0.0%	68.3%	31.6%	2.5%
Approach	0.4%			1.4%			0.8%			9.3%		
Intersection	2.1%											

PM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	70	572	31	267	101	68	238	1,068	571	36	107	145
2005 No Build	76	702	33	288	109	73	477	1,296	613	39	115	280
2005 Build	76	702	66	288	151	73	501	1,296	613	57	139	293
Difference	0	0	33	0	42	0	24	0	0	18	24	13
Percent												
Movement	0.0%	0.0%	100.0%	0.0%	38.5%	0.0%	5.0%	0.0%	0.0%	46.2%	20.9%	4.6%
Approach	4.1%			8.9%			1.0%			12.7%		
Intersection	3.8%											

$$0.048 * \$373,650 = \$17,935 \approx \$18,000$$

UNSER AND LADERA

Additional sb through, and eb right, and wb left

Conceptual estimate does not include right-of-way and relocation costs or any utility relocations

LENGTH = 500' each, WIDTH = 12' PLUS TAPERS

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
4.010	CONSTRUCTION STAKING, COMPL.	LS	1		\$2,600.00
8.050	MOBILIZATION	LS	1		\$142,000.00
6.06	Construction Demobilization, compl.	LS	1		\$2,600.00
19.010	TRAFFIC CONTROL	LS	1		\$6,500.00
201.010	SITE CLEARING & GRUBBING, COMPL.	LS	1		\$1,300.00
	SUBTOTAL				\$155,000.00
	ROADWAY				
205.010	Borrow, Hauling & Compaction of suitable fill material obtained outside construction limits, compl. (ASSUME .5 FT)	CY	402	\$7.00	\$2,814.26
301.020	Subgrade Prep. 12" at 95% compaction, cip.	SY	2,412	\$1.50	\$3,618.33
302.015	Aggregate Base Course, crushed, 4" at 95% compaction, cip. SD 2408	SY	4,824	\$5.50	\$26,534.44
336.010	Prime Coat, emulsified asphalt, cip.	SY	2,412	\$0.40	\$964.89
336.032	Arterial Asphalt Concrete, Type B, 1 1/2" inch thick, machine laydown, cip.	SY	2,412	\$3.80	\$9,166.44
336.034	Arterial Asphalt Concrete, Type A, 2 inch thick, machine laydown, cip.	SY	2,412	\$4.50	\$10,855.00
336.038	Arterial Asphalt Concrete, Type A, 3 inch thick, machine laydown, cip.	SY	2,412	\$8.00	\$19,297.78
336.120	Tack Coat, cationic emulsified asphalt, cip.	SY	4,824	\$0.20	\$964.89
340.010	Sidewalk, 4" thick, Portland Cement Concrete, incl. subgrade compaction, cip. SD 2430 (5')	SY	156	\$25.00	\$3,888.89
340.050	Curb & Gutter, Standard, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	910	\$12.00	\$10,920.00
340.060	Curb & Gutter, Median, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	850	\$8.00	\$6,800.00
343.030	Existing Pavement, Asphalt Concrete, more than 4" thick, sawcut, remove & dispose, compl.	SY	93	\$4.00	\$480.00
343.080	Existing Curb & Gutter or Valley Gutter, Portland Cement Concrete, remove & dispose, compl.	LF	910	\$3.75	\$3,412.50
343.xx	Existing Bituminous Curb & Gutter, remove & dispose, compl.	LF	515	\$1.00	\$515.00
343.090	Existing Sidewalk & Drivepad, sawcut, remove & dispose, compl.	SY	156	\$5.00	\$777.78
	SUBTOTAL ROADWAY				\$101,010.20
	PERMANENT SIGNING & STRIPING				
441.001	Reflectorized Plastic Pavement Markings, 4" width, cip.	LF	2,125	\$0.70	\$1,487.50
441.004	Reflectorized Plastic Pavement Markings, 12" width, cip.	LF	768	\$2.00	\$1,536.00
441.010	Reflectorized Plastic Arrow, Right or Left, cip.	EA	6	\$90.00	\$540.00
441.020	Reflectorized Plastic Word, Only, cip.	EA	3	\$120.00	\$360.00
450.001	Aluminum Panel Sign, cip. (6X9SF)	SF	54	\$14.00	\$756.00
450.010	Square Tube Steel Posts & Base Posts for Aluminum Panel Sign, cip. (6 x12')	LF	72	\$5.50	\$396.00
	SUBTOTAL PERMANENT SIGNING & STRIPING				\$5,075.50
	SIGNALS				
422.111	Traffic Signal Mastarm, any size, remove & relocate	ea	3	\$750.00	\$2,250.00
423.002	Traffic Signal Mastarm Foundation	ea	3	\$820.00	\$2,460.00
424.006	rigid electrical conduit, 2" including trench, backfill, patching, pushing, boring & jacking	lf	250	\$4.50	\$1,125.00
425.002	Electrical Pull box (Standard)	ea	4	\$320.00	\$1,280.00

UNSER AND LADERA

Additional sb through, and eb right, and wb left

Conceptual estimate does not include right-of-way and relocation costs or any utility relocations

LENGTH = 500' each, WIDTH = 12' PLUS TAPERS

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
425.101	Electrical Pull box, any size, remove and dispose	ea	4	\$85.00	\$340.00
426.001	Single Conductor, 2	lf	500	\$1.25	\$625.00
	SUBTOTAL SIGNALS				\$8,080.00
	LIGHTING				
432.102	Roadway Luminaire, remove and relocate	ea	2	\$300.00	\$600.00
422.131	Street Light Standard, remove and relocate	ea	2	\$1,030.00	\$2,060.00
423.020	Luminaire foundation for luminaire height at 40' or less, cip	EA	2	\$400.00	\$800.00
424.006	ELECTRICAL CONDUIT, 2", INCL. TRENCHING, BACKFILL, PATCHING, PUSHING, BORING, & JACKING, CIP	LF	150	\$4.30	\$645.00
425.002	ELECTRICAL PULL BOX (STANDARD), CIP	EA	1	\$300.00	\$300.00
426.003	SINGLE CONDUCTOR, #6, CIP	LF	150	\$0.75	\$112.50
	SUBTOTAL LIGHTING				\$4,517.50
	SUBTOTAL CONSTRUCTION				\$273,683.20
	CONTINGENCIES (8%)				\$21,894.66
	CONSTRUCTION TOTAL				\$295,577.86
	DESIGN (8%)	LS			\$23,646.23
	DESIGN SURVEY	LS			\$11,823.11
	CITY AND NMSH&TD REVIEW 3.25%				\$9,606.28
	CONSTRUCTION MANAGEMENT 3.35%				\$9,901.86
	TESTING 2%				\$5,911.56
	NMGRT (5.8125%)	%			\$17,180.46
	TOTAL PROJECT COST				\$373,647.36

UNSER AND LADERA
Additional EB right only

Conceptual estimate does not include right-of-way and relocation costs or any utility relocations

LENGTH = 200', WIDTH = 12' PLUS 150' TAPER

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
4.010	CONSTRUCTION STAKING, COMPL.	LS	1	\$570.00	\$570.00
8.050	MOBILIZATION	LS	1	\$2,280.00	\$2,280.00
6.06	Construction Demobilization, compl.	LS	1	\$570.00	\$570.00
19.010	TRAFFIC CONTROL	LS	1	\$1,500.00	\$1,500.00
201.010	SITE CLEARING & GRUBBING, COMPL.	LS	1	\$300.00	\$300.00
	SUBTOTAL				\$5,220.00
	ROADWAY				
205.010	Borrow, Hauling & Compaction of suitable fill material obtained outside construction limits, compl. (ASSUME .5 FT)	CY	61	\$7.00	\$428.17
301.020	Subgrade Prep. 12" at 95% compaction, cip.	SY	445	\$1.50	\$667.50
302.015	Aggregate Base Course, crushed, 4" at 95% compaction, cip. SD 2408	SY	445	\$5.50	\$2,447.50
336.010	Prime Coat, emulsified asphalt, cip.	SY	445	\$0.40	\$178.00
336.032	Arterial Asphalt Concrete, Type B, 1 1/2" inch thick, machine laydown, cip.	SY	445	\$3.80	\$1,691.00
336.034	Arterial Asphalt Concrete, Type A, 2 inch thick, machine laydown, cip.	SY	445	\$4.50	\$2,002.50
336.038	Arterial Asphalt Concrete, Type A, 3 inch thick, machine laydown, cip.	SY	445	\$8.00	\$3,560.00
336.120	Tack Coat, cationic emulsified asphalt, cip.	SY	445	\$0.20	\$89.00
340.010	Sidewalk, 4" thick, Portland Cement Concrete, incl. subgrade compaction, cip. SD 2430 (5')	SY	161	\$25.00	\$4,027.78
340.050	Curb & Gutter, Standard, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	400	\$12.00	\$4,800.00
340.060	Curb & Gutter, Median, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	-	\$8.00	\$0.00
343.030	Existing Pavement, Asphalt Concrete, more than 4" thick, sawcut, remove & dispose, compl.	SY	78	\$4.00	\$311.11
343.080	Existing Curb & Gutter or Valley Gutter, Portland Cement Concrete, remove & dispose, compl.	LF	400	\$3.75	\$1,500.00
343.xx	Existing Bituminous Curb & Gutter, remove & dispose, compl.	LF	-	\$1.00	\$0.00
343.090	Existing Sidewalk & Drivepad, sawcut, remove & dispose, compl.	SY	161	\$5.00	\$805.56
	SUBTOTAL ROADWAY				\$22,508.11
	PERMANENT SIGNING & STRIPING				
441.001	Reflectorized Plastic Pavement Markings, 4" width, cip.	LF	200	\$0.70	\$140.00
441.004	Reflectorized Plastic Pavement Markings, 12" width, cip.	LF	60	\$2.00	\$120.00
441.010	Reflectorized Plastic Arrow, Right or Left, cip.	EA	2	\$90.00	\$180.00
441.020	Reflectorized Plastic Word, Only, cip.	EA	1	\$120.00	\$120.00
450.001	Aluminum Panel Sign, cip. (3@9SF)	SF	27	\$14.00	\$378.00
450.010	Square Tube Steel Posts & Base Posts for Aluminum Panel Sign, cip. (3@12')	LF	36	\$5.50	\$198.00
	SUBTOTAL PERMANENT SIGNING & STRIPING				\$1,136.00
	SIGNALS				
422.102	Traffic Signal Ped pole, any size, remove & relocate	ea		\$400.00	\$0.00
423.001	Traffic Signal ped pole Foundation	ea		\$325.00	\$0.00
424.006	rigid electrical conduit, 2" including trench, backfill, patching, pushing, boring & jacking	lf		\$4.50	\$0.00
425.002	Electrical Pull box (Standard)	ea		\$320.00	\$0.00

UNSER AND LADERA

Additional EB right only

Conceptual estimate does not include right-of-way and relocation costs or any utility relocations

LENGTH = 200', WIDTH = 12' PLUS 150' TAPER

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
425.101	Electrical Pull box, any size, remove and dispose	ea		\$85.00	\$0.00
426.001	Single Conductor, 2	lf		\$1.25	\$0.00
	SUBTOTAL SIGNALS				\$0.00
	LIGHTING				
432.102	Roadway Luminaire, remove and relocate	ea	1	\$300.00	\$300.00
422.131	Street Light Standard, remove and relocate	ea	1	\$1,030.00	\$1,030.00
423.020	Luminaire foundation for luminaire height at 40' or less, cip	EA	1	\$400.00	\$400.00
424.006	ELECTRICAL CONDUIT, 2", INCL. TRENCHING, BACKFILL, PATCHING, PUSHING, BORING, & JACKING, CIP	LF	200	\$4.30	\$860.00
425.002	ELECTRICAL PULL BOX (STANDARD), CIP	EA	0	\$300.00	\$0.00
426.003	SINGLE CONDUCTOR, #6, CIP	LF	200	\$0.75	\$150.00
	SUBTOTAL LIGHTING				\$2,740.00
	SUBTOTAL CONSTRUCTION				\$31,604.11
	CONTINGENCIES (8%)				\$2,528.33
	CONSTRUCTION TOTAL				\$34,132.44
	DESIGN (8%)	LS			\$2,730.60
	DESIGN SURVEY	LS			\$1,365.30
	CITY AND NMSH&TD REVIEW 3.25%				\$1,109.30
	CONSTRUCTION MANAGEMENT 3.35%				\$1,143.44
	TESTING 2%				\$682.65
	NMGRT (5.8125%)	%			\$1,983.95
	TOTAL PROJECT COST				\$43,147.67

UNSER AND LADERA

3rd WB left, exten 2nd WB left, and widen Unser to accommodate a triple left
 Conceptual estimate does not include right-of-way and relocation costs or any utility relocations
 LENGTH = 200' 3rd left, 800' 2nd left, 480' Unser, WIDTH = 12' PLUS 150' TAPER

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
4.010	CONSTRUCTION STAKING, COMPL.	LS	1	\$1,970.00	\$1,970.00
8.050	MOBILIZATION	LS	1	\$7,880.00	\$7,880.00
6.06	Construction Demobilization, compl.	LS	1	\$1,970.00	\$1,970.00
19.010	TRAFFIC CONTROL	LS	1	\$4,925.00	\$4,925.00
201.010	SITE CLEARING & GRUBBING, COMPL.	LS	1	\$985.00	\$985.00
	SUBTOTAL				\$17,730.00
	ROADWAY				
205.010	Borrow, Hauling & Compaction of suitable fill material obtained outside construction limits, compl. (ASSUME .5 FT)	CY	346	\$7.00	\$2,419.67
301.020	Subgrade Prep. 12" at 95% compaction, cip.	SY	2,181	\$1.50	\$3,271.00
302.015	Aggregate Base Course, crushed, 4" at 95% compaction, cip. SD 2408	SY	2,181	\$5.50	\$11,993.67
336.010	Prime Coat, emulsified asphalt, cip.	SY	2,181	\$0.40	\$872.27
336.032	Arterial Asphalt Concrete, Type B, 1 1/2" inch thick, machine laydown, cip.	SY	2,181	\$3.80	\$8,286.53
336.034	Arterial Asphalt Concrete, Type A, 2 inch thick, machine laydown, cip.	SY	2,181	\$4.50	\$9,813.00
336.038	Arterial Asphalt Concrete, Type A, 3 inch thick, machine laydown, cip.	SY	2,181	\$8.00	\$17,445.33
336.120	Tack Coat, cationic emulsified asphalt, cip.	SY	2,181	\$0.20	\$436.13
340.010	Sidewalk, 4" thick, Portland Cement Concrete, incl. subgrade compaction, cip. SD 2430 (5')	SY	267	\$25.00	\$6,666.67
340.050	Curb & Gutter, Standard, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	480	\$12.00	\$5,760.00
340.060	Curb & Gutter, Median, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	1,200	\$8.00	\$9,600.00
343.030	Existing Pavement, Asphalt Concrete, more than 4" thick, sawcut, remove & dispose, compl.	SY	107	\$4.00	\$426.67
343.080	Existing Curb & Gutter or Valley Gutter, Portland Cement Concrete, remove & dispose, compl.	LF	480	\$3.75	\$1,800.00
343.xx	Existing Bituminous Curb & Gutter, remove & dispose, compl.	LF	400	\$1.00	\$400.00
343.090	Existing Sidewalk & Drivepad, sawcut, remove & dispose, compl.	SY	267	\$5.00	\$1,333.33
	SUBTOTAL ROADWAY				\$80,524.27
	PERMANENT SIGNING & STRIPING				
441.001	Reflectorized Plastic Pavement Markings, 4" width, cip.	LF	520	\$0.70	\$364.00
441.004	Reflectorized Plastic Pavement Markings, 12" width, cip.	LF	60	\$2.00	\$120.00
441.010	Reflectorized Plastic Arrow, Right or Left, cip.	EA	4	\$90.00	\$360.00
441.020	Reflectorized Plastic Word, Only, cip.	EA	2	\$120.00	\$240.00
450.001	Aluminum Panel Sign, cip. (3@9SF)	SF	27	\$14.00	\$378.00
450.010	Square Tube Steel Posts & Base Posts for Aluminum Panel Sign, cip. (3@12')	LF	36	\$5.50	\$198.00
	SUBTOTAL PERMANENT SIGNING & STRIPING				\$1,660.00
	SIGNALS				
422.102	Traffic Signal Ped pole, any size, remove & relocate	ea	1	\$400.00	\$400.00
423.001	Traffic Signal ped pole Foundation	ea	1	\$325.00	\$325.00
422.111	Traffic Signal Mastarm, any size, remove & relocate	ea	1	\$750.00	\$750.00
423.002	Traffic Signal Mastarm Foundation	ea	1	\$820.00	\$820.00
423.003	Traffic Signal Controller Foundation	ea	1	\$380.00	\$380.00

UNSER AND LADERA

3rd WB left, exten 2nd WB left, and widen Unser to accommodate a triple left
 Conceptual estimate does not include right-of-way and relocation costs or any utility relocations
 LENGTH = 200' 3rd left, 800' 2nd left, 480' Unser, WIDTH = 12' PLUS 150' TAPER

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
423.101	Traffic Signal Foundation Mastarm, Remove & Dispose	ea	1	\$335.00	\$335.00
423.102	Traffic Signal Foundation for Pedestal Pole, Remove & Dispose	ea	1	\$350.00	\$350.00
423.103	Traffic Controller Foundation, Remove & Dispose	ea	1	\$265.00	\$265.00
424.006	rigid electrical conduit, 2" including trench, backfill, patching, pushing, boring & jacking	lf	200	\$4.50	\$900.00
425.002	Electrical Pull box (Standard)	ea	1	\$320.00	\$320.00
425.101	Electrical Pull box, any size, remove and dispose	ea	1	\$85.00	\$85.00
426.001	Single Conductor, 2	lf	400	\$1.25	\$500.00
429.102	Signal Controller, any type, remove & relocate	ea	1	\$365.00	\$365.00
429.122	Controller cabinet, any type, remove & relocate	ea	1	\$420.00	\$420.00
	SUBTOTAL SIGNALS				\$6,215.00
	LIGHTING				
432.102	Roadway Luminaire, remove and relocate	ea	1	\$300.00	\$300.00
422.131	Street Light Standard, remove and relocate	ea	1	\$1,030.00	\$1,030.00
423.020	Luminaire foundation for luminaire height at 40' or less, cip	EA	1	\$400.00	\$400.00
424.006	ELECTRICAL CONDUIT, 2", INCL. TRENCHING, BACKFILL, PATCHING, PUSHING, BORING, & JACKING, CIP	LF	150	\$4.30	\$645.00
425.002	ELECTRICAL PULL BOX (STANDARD), CIP	EA	1	\$300.00	\$300.00
426.003	SINGLE CONDUCTOR, #6, CIP	LF	150	\$0.75	\$112.50
	SUBTOTAL LIGHTING				\$2,787.50
	SUBTOTAL CONSTRUCTION				\$108,916.77
	CONTINGENCIES (8%)				\$8,713.34
	CONSTRUCTION TOTAL				\$117,630.11
	DESIGN (8%)	LS			\$9,410.41
	DESIGN SURVEY	LS			\$4,705.20
	CITY AND NMSH&TD REVIEW 3.25%				\$3,822.98
	CONSTRUCTION MANAGEMENT 3.35%				\$3,940.61
	TESTING 2%				\$2,352.60
	NMGRT (5.8125%)	%			\$6,837.25
	TOTAL PROJECT COST				\$148,699.16

Proportion of Traffic at Ladera and Unser Attributable to Sundoro
(Includes Diversion of Existing Traffic to 98th Street Interchange)

INTERSECTION: Ladera and Unser

AM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	78	2,355	15	693	91	37	90	321	272	37	108	516
2005 No Build	84	2,679	16	746	98	40	161	389	292	40	117	748
2005 Build	84	2,679	25	746	111	40	131	389	292	69	154	658
Difference	0	0	10	0	12	0	-30	0	0	29	37	-90
Percent												
Movement	0.0%	0.0%	61.4%	0.0%	12.7%	0.0%	-18.7%	0.0%	0.0%	70.6%	31.4%	-12.0%
Approach	0.3%			1.4%			-3.6%			-2.7%		
Intersection	-0.6%											

Add to: 87
Take away: 120
Net: -32

PM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	70	572	30	267	101	67	237	1,067	570	35	106	145
2005 No Build	75	701	33	287	108	73	476	1,295	613	38	115	279
2005 Build	75	701	66	287	151	73	373	1,295	613	57	138	221
Difference	0	0	33	0	43	0	-103	0	0	18	24	-58
Percent												
Movement	0.0%	0.0%	101.4%	0.0%	39.4%	0.0%	-21.7%	0.0%	0.0%	48.0%	20.6%	-20.8%
Approach	4.1%			9.1%			-4.3%			-3.7%		
Intersection	-1.1%											

Add to: 118
Take away: 161
Net: -44

**Proportion of Traffic at Ladera and Unser Attributable to Sundoro
(No Diversion of Existing Traffic OR Site Traffic to 98th Street Interchange)**

INTERSECTION: Ladera and Unser

AM Peak Hour

AM Peak Hour	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	78	2,355	15	693	91	37	90	321	272	37	108	516
2005 No Build	84	2,679	16	746	98	40	161	389	292	40	117	748
2005 Build	84	2,679	25	746	111	40	234	389	292	69	154	963
Difference	0	0	10	0	12	0	73	0	0	29	37	215
Percent												
Movement	0.0%	0.0%	61.4%	0.0%	12.7%	0.0%	45.3%	0.0%	0.0%	70.6%	31.4%	28.7%
Approach	0.3%			1.4%			8.7%			30.9%		
Intersection	6.9%											

PM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	70	572	30	267	101	67	237	1,067	570	35	106	145
2005 No Build	75	701	33	287	108	73	476	1,295	613	38	115	279
2005 Build	75	701	66	287	151	73	725	1,295	613	57	138	417
Difference	0	0	33	0	43	0	249	0	0	18	24	138
Percent												
Movement	0.0%	0.0%	101.4%	0.0%	39.4%	0.0%	52.4%	0.0%	0.0%	48.0%	20.6%	49.5%
Approach	4.1%			9.1%			10.5%			41.7%		
Intersection	12.3%											

UNSER AND LADERA

Additional sb right, and eb right, extend wb left (assume existing is 200')

Conceptual estimate does not include right-of-way and relocation costs or any utility relocations

LENGTH = 500' each, WIDTH = 12' PLUS TAPERS

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
4.010	CONSTRUCTION STAKING, COMPL.	LS	1	\$3,220.00	\$3,220.00
8.050	MOBILIZATION	LS	1	\$13,920.00	\$13,920.00
6.06	Construction Demobilization, compl.	LS	1	\$3,480.00	\$3,480.00
19.010	TRAFFIC CONTROL	LS	1	\$8,200.00	\$8,200.00
201.010	SITE CLEARING & GRUBBING, COMPL.	LS	1	\$1,750.00	\$1,750.00
	SUBTOTAL				\$30,570.00
	ROADWAY				
205.010	Borrow, Hauling & Compaction of suitable fill material obtained outside construction limits, compl. (ASSUME .5 FT)	CY	440	\$7.00	\$3,080.00
301.020	Subgrade Prep. 12" at 95% compaction, cip.	SY	2,615	\$1.50	\$3,922.50
302.015	Aggregate Base Course, crushed, 4" at 95% compaction, cip. SD 2408	SY	5,230	\$5.50	\$28,765.00
336.010	Prime Coat, emulsified asphalt, cip.	SY	2,615	\$0.40	\$1,046.00
336.032	Arterial Asphalt Concrete, Type B, 1 1/2" inch thick, machine laydown, cip.	SY	2,615	\$3.80	\$9,937.00
336.034	Arterial Asphalt Concrete, Type A, 2 inch thick, machine laydown, cip.	SY	2,615	\$4.50	\$11,767.50
336.038	Arterial Asphalt Concrete, Type A, 3 inch thick, machine laydown, cip.	SY	5,230	\$8.00	\$41,840.00
336.120	Tack Coat, cationic emulsified asphalt, cip.	SY	5,230	\$0.20	\$1,046.00
340.010	Sidewalk, 4" thick, Portland Cement Concrete, incl. subgrade compaction, cip. SD 2430 (5')	SY	361	\$25.00	\$9,027.78
340.050	Curb & Gutter, Standard, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	650	\$12.00	\$7,800.00
340.060	Curb & Gutter, Median, Portland Cement Concrete, incl. subgrade preparation, cip. SD 2415	LF	950	\$8.00	\$7,600.00
343.030	Existing Pavement, Asphalt Concrete, more than 4" thick, sawcut, remove & dispose, compl.	SY	358	\$4.00	\$480.00
343.080	Existing Curb & Gutter or Valley Gutter, Portland Cement Concrete, remove & dispose, compl.	LF	1,610	\$3.75	\$6,037.50
343.090	Existing Sidewalk & Driveway, sawcut, remove & dispose, compl.	SY	361	\$5.00	\$1,805.56
	SUBTOTAL ROADWAY				\$134,154.83
	PERMANENT SIGNING & STRIPING				
441.001	Reflectorized Plastic Pavement Markings, 4" width, cip.	LF	1,700	\$0.70	\$1,190.00
441.004	Reflectorized Plastic Pavement Markings, 12" width, cip.	LF	300	\$2.00	\$600.00
441.005	Reflectorized Plastic Pavement Markings, 24" width, cip.	LF	150	\$4.50	\$675.00
441.010	Reflectorized Plastic Arrow, Right, cip.	EA	3	\$90.00	\$270.00
441.020	Reflectorized Plastic Word, Only, cip.	EA	2	\$120.00	\$240.00
450.001	Aluminum Panel Sign, cip. (16X9SF)	SF	50	\$14.00	\$700.00
450.010	Square Tube Steel Posts & Base Posts for Aluminum Panel Sign, cip. (16 x12')	LF	60	\$5.50	\$330.00
	SUBTOTAL PERMANENT SIGNING & STRIPING				\$4,005.00
	SIGNALS				
422.111	Traffic Signal Mastarm, any size, remove & relocate	ea	2	\$750.00	\$1,500.00
423.002	Traffic Signal Mastarm Foundation	ea	2	\$820.00	\$1,640.00
424.006	rigid electrical conduit, 2" including trench, backfill, patching, pushing, boring & jacking	lf	200	\$4.50	\$900.00
425.002	Electrical Pull box (Standard)	ea	2	\$320.00	\$640.00
425.101	Electrical Pull box, any size, remove and dispose	ea	2	\$85.00	\$170.00

UNSER AND LADERA

Additional sb right, and eb right, extend wb left (assume existing is 200')

Conceptual estimate does not include right-of-way and relocation costs or any utility relocations

LENGTH = 500' each, WIDTH = 12' PLUS TAPERS

SPEC. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT
426.001	Single Conductor, 2	lf	400	\$1.25	\$500.00
	SUBTOTAL SIGNALS				\$5,350.00
	LIGHTING				
432.102	Roadway Luminaire, remove and relocate	ea	2	\$300.00	\$600.00
422.131	Street Light Standard, remove and relocate	ea	2	\$1,030.00	\$2,060.00
423.020	Luminaire foundation for luminaire height at 40' or less, cip	EA	2	\$400.00	\$800.00
424.006	ELECTRICAL CONDUIT, 2", INCL. TRENCHING, BACKFILL, PATCHING, PUSHING, BORING, & JACKING, CIP	LF	50	\$4.30	\$215.00
425.002	ELECTRICAL PULL BOX (STANDARD), CIP	EA	1	\$300.00	\$300.00
426.003	SINGLE CONDUCTOR, #6, CIP	LF	50	\$0.75	\$37.50
	SUBTOTAL LIGHTING				\$4,012.50
	SUBTOTAL CONSTRUCTION				\$178,092.33
	CONTINGENCIES (8%)				\$14,247.39
	CONSTRUCTION TOTAL				\$192,339.72
	DESIGN (8%)	LS			\$15,387.18
	DESIGN SURVEY	LS			\$7,693.59
	CITY AND NMSH&TD REVIEW 3.25%				\$6,251.04
	CONSTRUCTION MANAGEMENT 3.35%				\$6,443.38
	TESTING 2%				\$3,846.79
	NMGRT (5.8125%)	%			\$11,179.75
	TOTAL PROJECT COST				\$243,141.45

Proportion of Traffic at Ladera and Unser Attributable to Sundoro
(Includes Diversion of Existing Traffic to 98th Street Interchange)

(Add Traffic)

INTERSECTION: Ladera and Unser

AM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	78	2,355	15	693	91	37	90	321	272	37	108	516
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2005 Build	84	2,679	25	746	111	40	131	389	292	69	154	658
Difference	0	0	10	0	12	0	-30	0	0	29	37	-90
Percent	3.6%2.3%											
Movement	0.0%	0.0%	61.4%	0.0%	12.7%	0.0%	-18.7%	0.0%	0.0%	70.6%	31.4%	-12.0%
Approach	0.3%			1.4%			-3.6%			-2.7%		
Intersection	-0.6%											

Add to: 87
Take away: 120
Net: -32

PM Peak Hour

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2003 Volumes	70	572	30	267	101	67	237	1,067	570	35	106	145
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2005 Build	75	701	66	287	151	73	373	1,295	613	57	138	221
Difference	0	0	33	0	43	0	-103	0	0	18	24	-58
Percent	4%3.7%											
Movement	0.0%	0.0%	101.4%	0.0%	39.4%	0.0%	-21.7%	0.0%	0.0%	48.0%	20.6%	-20.8%
Approach	4.1%			9.1%			-4.3%			-3.7%		
Intersection	-1.1%											

Add to: 118
Take away: 161
Net: -44

(only sundries)

	Southbound			Westbound			Northbound			Eastbound		
	Unser			Ladera			Unser			Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
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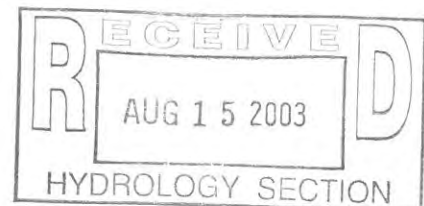
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	SUBTOTAL LIGHTING				\$4,012.50
	SUBTOTAL CONSTRUCTION				\$178,092.33
	CONTINGENCIES (8%)				\$14,247.39
	CONSTRUCTION TOTAL				\$192,339.72
	DESIGN (8%)	LS			\$15,387.18
	DESIGN SURVEY	LS			\$7,693.59
	CITY AND NMSH&TD REVIEW 3.25%				\$6,251.04
	CONSTRUCTION MANAGEMENT 3.35%				\$6,443.38
	TESTING 2%				\$3,846.79
	NMGRT (5.8125%)	%			\$11,179.75
	TOTAL PROJECT COST				\$243,141.45

PETROGLYPHS MASTER PLAN SUNDORO DEVELOPMENT TRAFFIC IMPACT STUDY

AUGUST 14, 2003



PREPARED FOR:

**WESTLAND DEVELOPMENT CO., INC
401 COORS BOULEVARD, NW
ALBUQUERQUE, NM 87121**

**PETROGLYPHS MASTER PLAN
SUNDORO DEVELOPMENT
TRAFFIC IMPACT STUDY
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I. INTRODUCTION

The Sundoro development of the Petroglyphs Master Plan area is a proposed subdivision located at the northeast and southeast corners of the future intersection of Ladera with 98th Street/Arroyo Vista. It is a residential only subdivision with about 300 lots on the north and 200 lots on the south side of Ladera. A vicinity map is shown in Figure 1 and the proposed site plan of the future development is shown in Figure 2.

A. Study Purpose

The purpose of the traffic study is to determine the impacts of the proposed development on the existing street network and to recommend any mitigation measures that may be necessary to support the additional traffic generated by the proposed development.

B. Study Procedure

The study was conducted using established traffic engineering procedures. A traffic study scoping meeting was held with City of Albuquerque Transportation Development staff. The scoping letter is included in Appendix A. The study was requested to include analysis of the following intersections:

- Ladera and Unser
- 98th Street and I-40 North and South Ramps
- Future intersection of 98th Street/Arroyo Vista and Ladera
- Future driveways with Ladera

The intersection evaluations include analysis for the AM and PM peak hours for the following traffic conditions:

- Existing (2003) traffic
- 2005- Completion Year without proposed development (No Build)
- 2005- Completion Year with proposed development (Build)



PROJECT AREA

INTERSTATE 40

INTERSTATE 25

**WESTLAND
TRANSPORTATION STUDY**

**FIGURE 1
VICINITY MAP**



Bohannon  **Huston**

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**WESTLAND
TRANSPORTATION STUDY**

**FIGURE 2
SITE PLAN**

PAGE

II. EXISTING AREA CHARACTERISTICS

A. General Area Characteristics

The site is located at the north-east and south-east corners of the future intersection of 98th Street/Arroyo Vista and Ladera. The surrounding area is mostly residential or currently vacant.

B. Area Street Network

Ladera Road, a minor arterial, is the primary access to the development. This road is proposed to be extended from its exiting terminus at Gavin to 98th Street/Arroyo Vista. The north half of Ladera, sufficient for 2 lanes of traffic, will be constructed from Gavin to 98th Street/Arroyo Vista. The south half will be constructed from 98th Street/Arroyo Vista to the eastern edge of the southern property, creating the ultimate 4-lane section for this portion of Ladera. Other portions of Ladera will be constructed as those parcels are developed.

98th Street, a principal arterial, is currently a grade separated interchange with Interstate 40 but does not currently extend north to Ladera. 98th Street will be extended north to Ladera with the Ladera and 98th Street/Arroyo Vista intersection being constructed to its ultimate configuration (6-lanes with median), with minor stubs provided on the north and west approaches.

Unser Boulevard currently provides access to Interstate 40. Unser is defined as a controlled access facility and is currently a 4-lane roadway between Interstate 40 and Montano Road. North of Ouray to the Bernalillo/Sandoval County Line, Unser is limited to a 4-lane section per the Unser Parkway Standard established by City Council Resolution R-455. No such limit on roadway lanes exists south of Ouray. The Long Range Roadway System Map also identifies the intersection of Ladera and Unser as a future grade separated interchange location.

The Interstate 40 westbound off-ramp has a free right turn movement to northbound 98th Street, with left turn and through movements intersecting with 98th Street at a STOP controlled intersection with the northbound to westbound left turn westbound on ramp traffic. The southbound to eastbound ramp is a cloverleaf loop ramp similar to Unser. The southbound to westbound on ramp traffic also has a free right turn movement to enter the interstate.

The Interstate 40 eastbound has a similar configuration, with northbound to eastbound and eastbound to southbound exiting traffic on free right turn lanes. The eastbound to northbound left and eastbound through traffic intersecting with 98th Street at a STOP controlled intersection.

C. Existing Traffic Volumes

Traffic count was done at the 98th Street and I-40 ramps on May 20, 2003 by Bohannon Huston and the traffic count on Ladera and Unser was done by the Mid-Region Council of Governments in November 2002, which was projected by the growth factor to the year 2003.

Figure 3 on page 7 is a summary of the existing peak hour traffic volumes. Existing traffic counts are included in Appendix B.

D. Existing Levels of Service

The 2000 Highway Capacity Manual (HCM) defines Level of Service (LOS) for signalized and un-signalized intersections as follows:

TABLE 1 - LOS DEFINITIONS			
Level of Service	Signalized (sec/veh)	Definition	Un-Signalized (sec/veh)
A	<10	Most vehicles do not stop.	<10
B	>10 and <20	Some vehicles stop.	>10 and <15
C	>20 and <35	Significant numbers of vehicles stop.	>15 and <25
D	>35 and <55	Many vehicles stop.	>25 and <35
E	>55 and <80	Limit of acceptable delay.	>35 and <50
F	>80	Unacceptable delay.	>50

LOS D is generally considered acceptable in urban areas and is the desirable base condition for analysis in a traffic study.

Existing intersection traffic volumes were analyzed using intersection methodology from the 2000 *Highway Capacity Manual* (HCM). SIGNAL2000 version 1.01.00 was utilized to perform the analysis of signalized intersection of Unser and Ladera. Individual intersection output is included in Appendix C. The results are summarized in the following table:

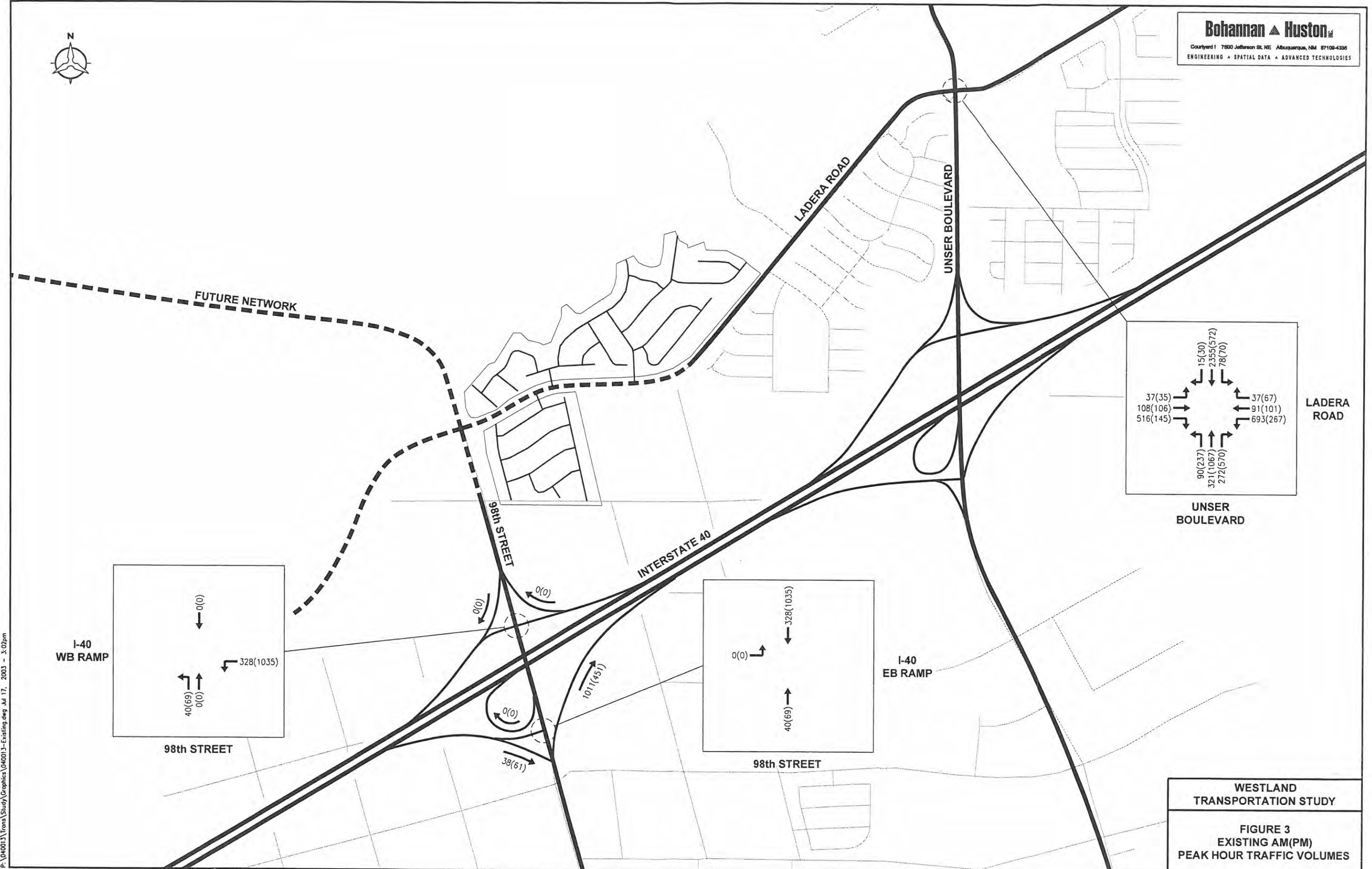
TABLE 2 – 2003 EXISTING SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS						
Signalized Intersections	AM Peak			PM Peak		
	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	242.1	1.30	F	29.1	0.57	C
Add 3 rd N/S Thru	152.2	1.08	F			
Plus 3 rd WB Left & 2 nd WB Right	62.5	0.88	E			

It can be seen from the table that Ladera and Unser currently operates at LOS F in the AM peak and needs substantial improvements to improve the level of service to normally acceptable levels

The un-signalized intersection of 98th St. and I-40 Ramps was analyzed using the un-signalized intersection analysis procedures of the 2000 HCM and the Hi-CAP software package was used. Intersection output from Hi-CAP is also included in Appendix C. The results of the un-signalized intersections capacity analysis are included in Table 3.

TABLE 3 – 2003 EXISTING UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Movement	AM Peak				PM Peak			
	Delay	v/c	Queue (veh)	LOS	Delay	v/c	Queue (veh)	LOS
98 th St. and I-40 WB Ramps								
WB Left	10.2	0.208	1	B	21.3	0.736	7	C
NB Left	7.3	0.028	<1	A	7.3	0.048	<1	A
98 th St. and I-40 EB Ramp								
EB Right	9.6	0.051	<1	A	14.2	0.148	1	B

It can be seen that the interchange ramp intersections currently operate at acceptable levels of service.



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**FIGURE 3
EXISTING AM(PM)
PEAK HOUR TRAFFIC VOLUMES**

III. BACKGROUND TRAFFIC PROJECTIONS

A. 2005 No-Build Traffic Projections

Existing traffic counts have been projected for the year 2005. The annual growth rates were developed from the MRCOG Traffic Flow Maps. Spreadsheets showing the development of the growth rates are in Appendix D.

B. Approved Developments Not Yet Constructed

There are new subdivisions in the area that have been approved and not yet completely constructed. The remainder of these developments are assumed to be complete by the year 2005. Therefore the trips generated by the remaining developments are included in the 2005 No Build analysis. The new developments considered in this analysis are as follow:

- Crossings Units 1 and 2
- Crossings Unit 3
- Painted Sky
- Parkway Unit 10
- Cielo Oeste
- Tierra Oeste
- Westridge

Figure 4 on page 10 shows the 2005 no build traffic volumes.

C. 2005 No-Build Intersection Capacity Analysis

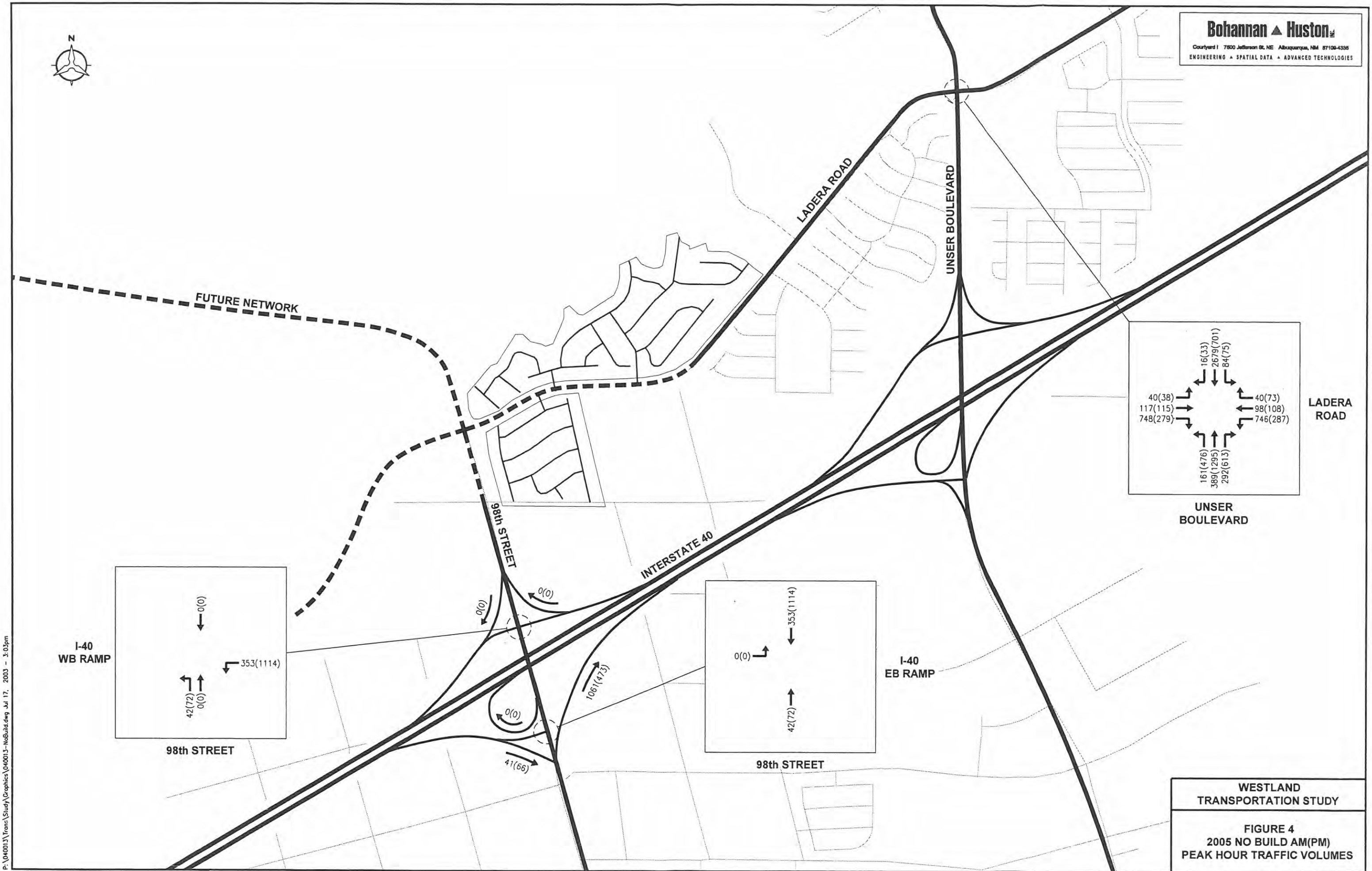
The intersections were again analyzed using SIGNAL2000 and Hi-Cap for signalized and un-signalized intersections, respectively. Table 4 and Table 5 are a summary of the 2005 No-Build results. SIGNAL2000 and Hi-CAP output is included in Appendix E.

TABLE 4 - 2005 NO-BUILD SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS						
Intersection	AM Peak			PM Peak		
	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	361.6	1.57	F	34.1	0.74	C*
Add 3 rd N/S Thru	258.3	1.33	F			
Plus 3 rd WB Left & 2 nd EB Right	125.7	1.05	F			
4 th N/S Thru with Above Turn Lanes	70.3	0.91	E**			
* - some movements LOS E						
** - some movements LOS F						

It can be seen from Table 4 that the AM peak hour in the 2005 no build scenario needs additional improvements beyond that required to address existing deficiencies in order for the intersection to operate at normally accepted levels of service in the AM peak hour.

TABLE 5 – 2005 NO-BUILD UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Movement	AM Peak				PM Peak			
	Delay	v/c	Queue (veh)	LOS	Delay	v/c	Queue (veh)	LOS
98 th St. and I-40 WB Ramps								
WB Left	10.4	0.226	1	B	25.7	0.802	8	D
NB Left	7.3	0.029	<1	A	7.3	0.050	<1	A
98 th St. and I-40 EB Ramp								
EB Right	9.7	0.057	<1	A	15.1	0.170	1	C

The off-ramp intersections operate at acceptable levels of service, although a substantial queue is developing for the dual westbound left turn lanes (8 vehicles in each lane).



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**FIGURE 4
2005 NO BUILD AM (PM)
PEAK HOUR TRAFFIC VOLUMES**

IV. PROPOSED SITE CHARACTERISTICS

A. Proposed Development

The proposed development is a residential subdivision. Upon construction of this subdivision, the adjacent streets, Ladera and 98th Street/Arroyo Vista will be both extended and will intersect. For the purposes of this study, construction of the entire site is anticipated to be complete in 2005.

The subdivision consists of 500 single family detached dwelling units. 300 of the units are on the north-east side of the 98th Street/Arroyo Vista and Ladera intersection, and 200 will be built on the south-east side of the intersection. Based on the preliminary site plan, the access to the subdivision will be only from Ladera for both north and south sections. There will not be any access from 98th Street/Arroyo Vista.

B. Trip Generation

Generated trips are broken down into three types; 1) primary, 2) pass-by trips, and 3) diverted link. The *Trip Generation* report defines these trips as follows:

- **Primary Trips** - These trips are made for the specific purpose of visiting the generator. The stop at that generator is the primary reason for the trip. For example, a home to shopping to home combination of trips is a primary trip set.
- **Pass-by Trips** - These trips are made as intermediate stops on the way from an origin to a primary trip generation. Pass-by trips are attracted from the traffic passing the site on an adjacent street that contains direct access to the generator site. These trips do not require a diversion from another roadway. For example, stopping at the store on the way home from work is an example of a pass-by trip. No pass-by trips are used in this analysis.
- **Diverted Linked Trips** - These trips are attracted from the traffic volume on the roadway within the vicinity of the generator, but which require a diversion from that roadway to another roadway to gain access to the site. The roadways could include streets or freeways adjacent to the generator, but without access to the generator.

For this study, the diverted link trips have been included in with the primary trips.

Projected trips for the proposed development were calculated from data in the Institute of Transportation Engineers (ITE) *Trip Generation*, 6th Edition, 1997. Trips generated by the proposed development were calculated as single family detached housing, ITE trip generation code 210.

Trips generated by the proposed development are summarized as follows:

TABLE 6 - TRIP GENERATION							
Land Use	ITE Land Use Code	Size	24 Hour Two-Way Volume	AM Peak Hour		PM Peak Hour	
				Enter	Exit	Enter	Exit
Single Family Detached Housing	210	500 Dwelling Units	4,785	95	280	325	180

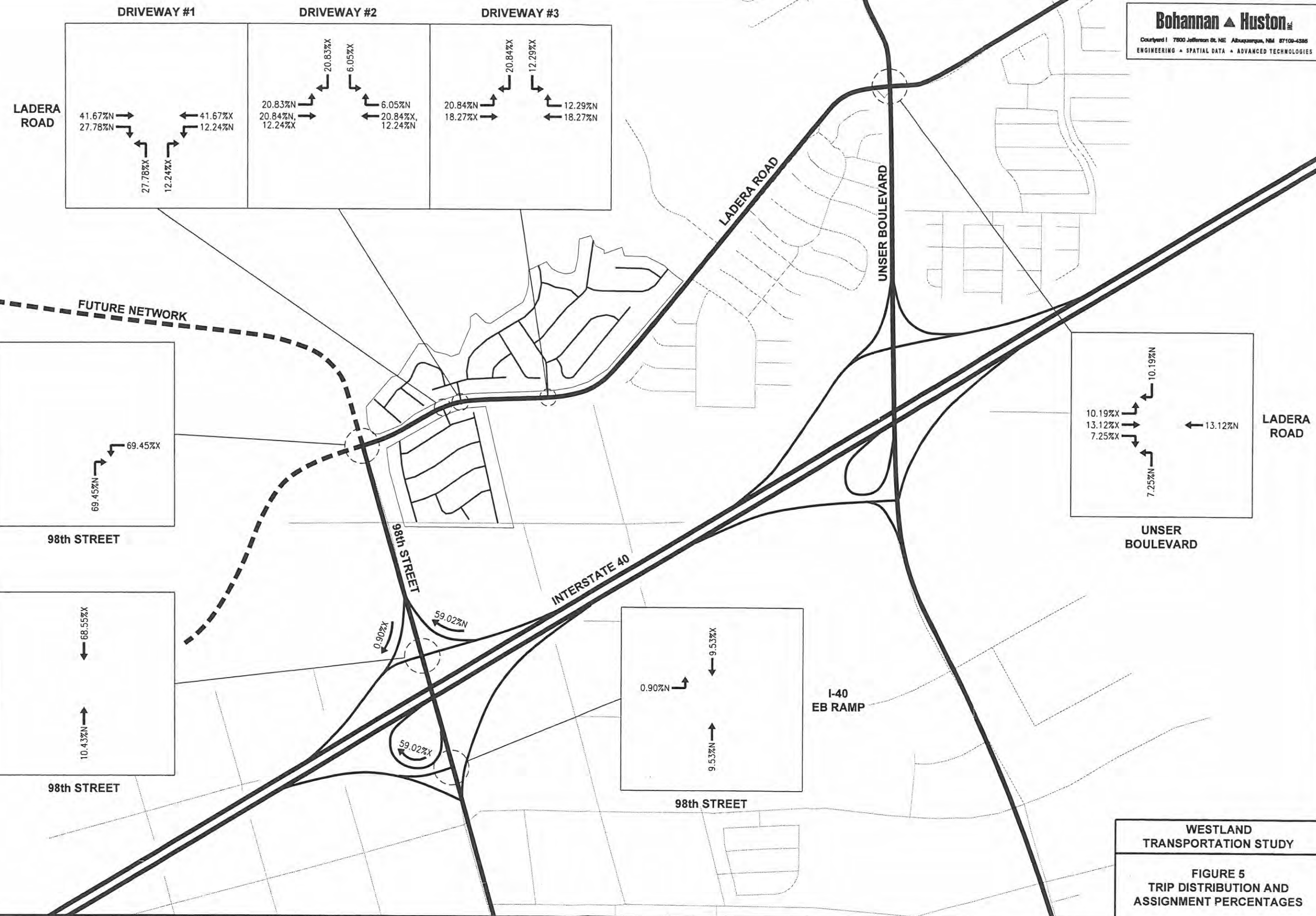
C. Trip Distribution and Assignment

A modified gravity model was used to distribute the 2005 traffic. The model assumes distribution for the residential land use is directly proportional to employment and inversely proportional to distance from the place of employment. 2005 employment for Sub-areas and DASZ's were determined by interpolating between 1995 and 2020 data. 1995 and 2020 employment for Sub-areas and DASZ's were taken from the Mid Region Council of Governments (MRCOG) **2020 Socioeconomic Forecasts for Data Analysis Sub-zones in State Planning and Development District 3** (TR-125).

Sub-areas and DASZ's were grouped based on the most likely existing major street(s) route to the tract. The trip distribution worksheets and associated maps of sub-areas and DASZ's are shown in Appendix F. The trip distribution percentages were applied to the projected trips to determine individual traffic movements. The assignment of the total projected trips to the individual intersections is shown on Figure 6 on page 14.

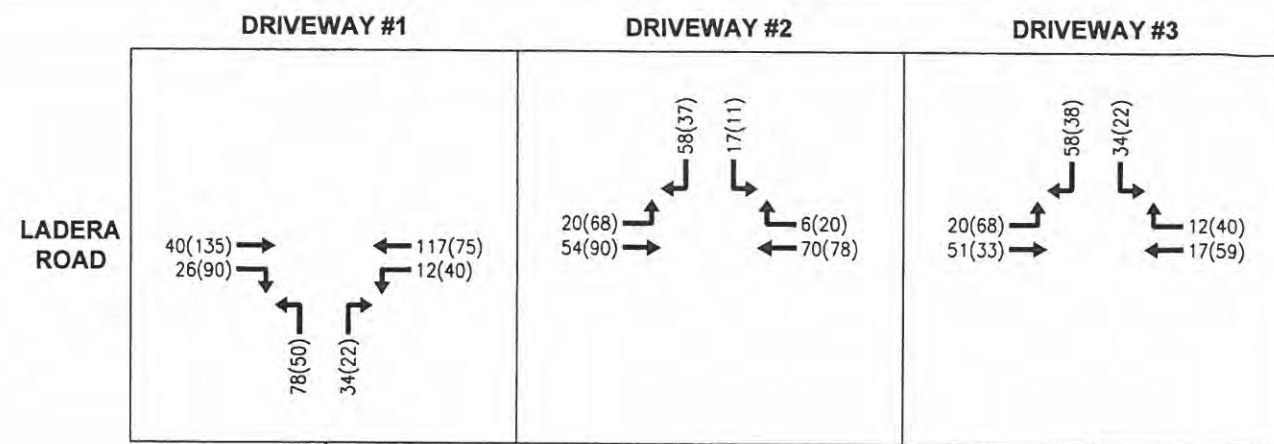


N = ENTERING
X = EXITING



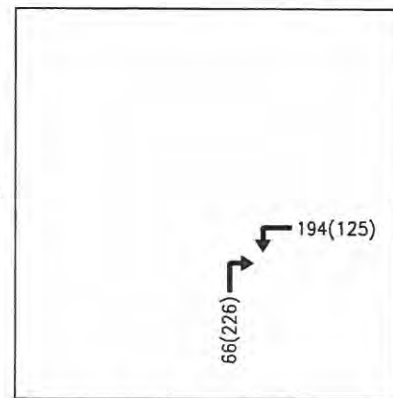
**WESTLAND
TRANSPORTATION STUDY**

**FIGURE 5
TRIP DISTRIBUTION AND
ASSIGNMENT PERCENTAGES**



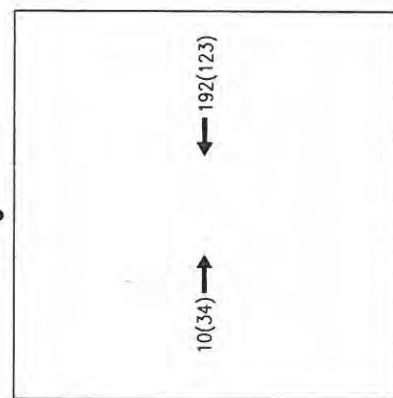
FUTURE NETWORK

LADERA ROAD



98th STREET

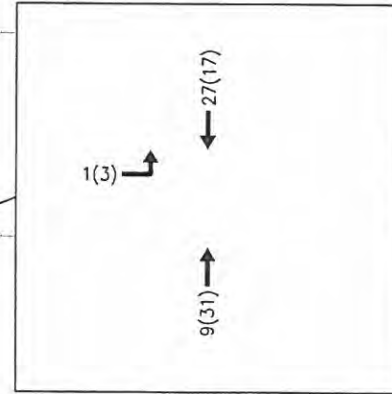
I-40
WB RAMP



98th STREET

98th STREET

INTERSTATE 40

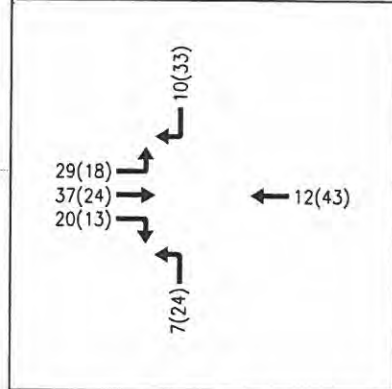


98th STREET

I-40
EB RAMP

LADERA ROAD

UNSER BOULEVARD



UNSER BOULEVARD

LADERA ROAD

**WESTLAND
TRANSPORTATION STUDY**

**FIGURE 6
TRIP DISTRIBUTION AND
ASSIGNMENT AM(PM)
PEAK HOUR TRAFFIC VOLUMES**

V. 2005 BUILD TRAFFIC ANALYSIS

With construction of the Sundoro subdivision, the two adjacent streets, Ladera and 98th Street/Arroyo Vista, will both be extended and will intersect with each other. Therefore, it is anticipated that to shorten their trip length, some of the traffic from Unser and Ladera will divert to the new extended streets and newly constructed intersection of 98th Street/Arroyo Vista and Ladera St. The anticipated traffic has been diverted from the intersection of Unser and Ladera to the 98th St. and I-40 Ramps, and the new intersection of 98th Street/Arroyo Vista and Ladera.

A. 2005 Build Traffic Volumes

Based on the trip distribution and assignments, the estimated traffic generated by the proposed development, as well as the diverted traffic was then added or subtracted to/from the 2005 No-Build traffic projections. Details of the 2005 Build traffic volume computations are included in Appendix G. Figure 7, page 18 is a summary of the 2005 Build Peak hour traffic projections.

B. Results and Discussion

The results for the 2005 Build signalized intersection of Unser and Ladera are summarized in Table 7 below. The existing un-signalized intersection of 98th and I-40 Ramps was also analyzed. The future un-signalized intersection of 98th Street/Arroyo Vista and Ladera streets was also analyzed for the 2005 Build condition, which is shown in Table 8 on page 16. SIGNAL2000 and Hi-CAP output is included in Appendix H.

TABLE 7 - 2005 BUILD SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS						
Intersection	AM Peak			PM Peak		
	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	331.4	1.51	F	37.5	0.76	D
Add 3 rd N/S T, 3 rd WB L, 2 nd EB R	111.2	1.02	F			
Add 4 th N/S T, 3 rd WB L, 2 nd EB R	61.9	0.88	E			
* - some movements LOS E						
** - some movements LOS F						

It can be seen from Table 7 that the Ladera and Unser intersection improves in operation over the no build scenario due to the diversion of traffic to the new access to the Interstate. This improvement could even be larger than that forecast due to the minimal control delay allowed by the configuration of the Ladera and 98th Street/Arroyo Vista intersection and the 98th Street on-ramps to Interstate 40.

TABLE 8 – 2005 BUILD UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Movement	AM Peak				PM Peak			
	Delay	v/c	Queue (veh)	LOS	Delay	v/c	Queue (veh)	LOS
98 th St. and I-40 WB Ramps								
WB Left	12.7	0.295	1	B	61.5	0.998	15	F
NB Left	8.1	0.039	<1	A	7.9	0.060	<1	A
98 th St. and I-40 EB Ramp								
EB Right	9.8	0.058	<1	A	15.3	0.173	1	C
EB Left	12.4	0.002	<1	B	37.2	0.026	<1	E
98 th St./Arroyo Vista and Ladera (New Intersection) – AWSC								
WB Left	13.3	0.502		B	12.1	0.365		B
NB Right	8.4	0.154		A	11.7	0.497		B
Ladera & Drive Way #1 (New Intersection) - TWSC								
NB Right	8.8	0.039	<1	A	9.6	0.031	<1	A
NB Left	10.8	0.125	<1	B	13.7	0.121	<1	B
WB Left	7.5	0.009	<1	A	8.2	0.038	<1	A
Ladera & Drive Way #2 (New Intersection) - TWSC								
SB Right	9.2	0.07	<1	A	9.0	0.045	<1	A
SB Left	10.7	0.031	<1	B	12.3	0.026	<1	B
EB Left	7.7	0.016	<1	A	7.8	0.055	<1	A
Ladera & Drive Way #3 (New Intersection) –TWSC								
SB Right	9.0	0.066	<1	A	8.9	0.043	<1	A
SB Left	10.3	0.053	<1	B	11.8	0.043	<1	B
EB Left	7.6	0.016	<1	A	7.8	0.055	<1	A
No queue lengths reported for AWSC								

It can be seen that with the addition of the build traffic and the diversion of traffic from Ladera and Unser to the 98th Street interchange, that the I-40 Westbound ramp intersection now operates at LOS F. Although the delay is rather large, it is not unreasonable, and is likely overstated a bit as the v/c is greater than 0.90. The HCM states that when the v/c ratio is over 0.90, the delay equation gives unreliable results. The anticipated queue is also 15 vehicles, which is around 300 feet, depending on vehicle mix. This queue does not extend past the free right turn lane for westbound to northbound traffic.

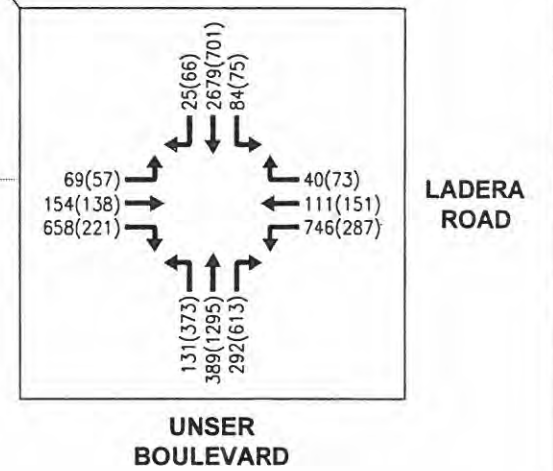
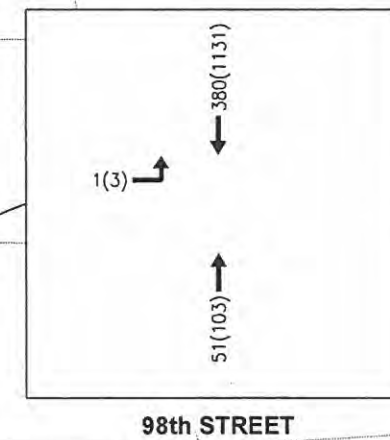
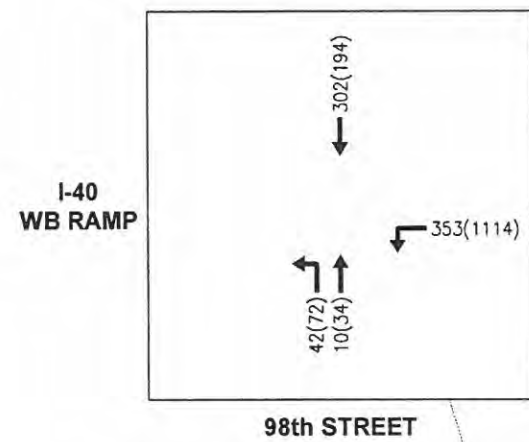
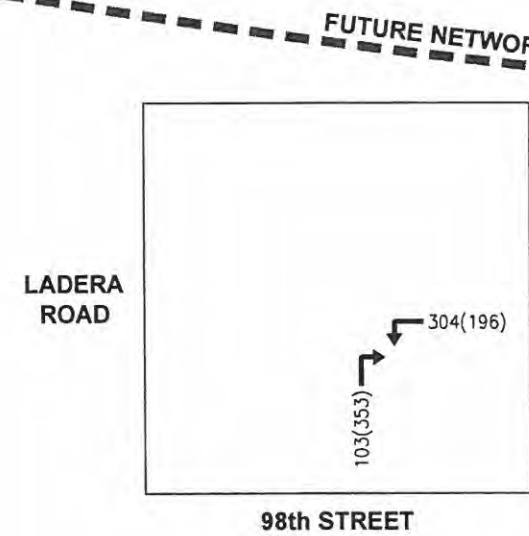
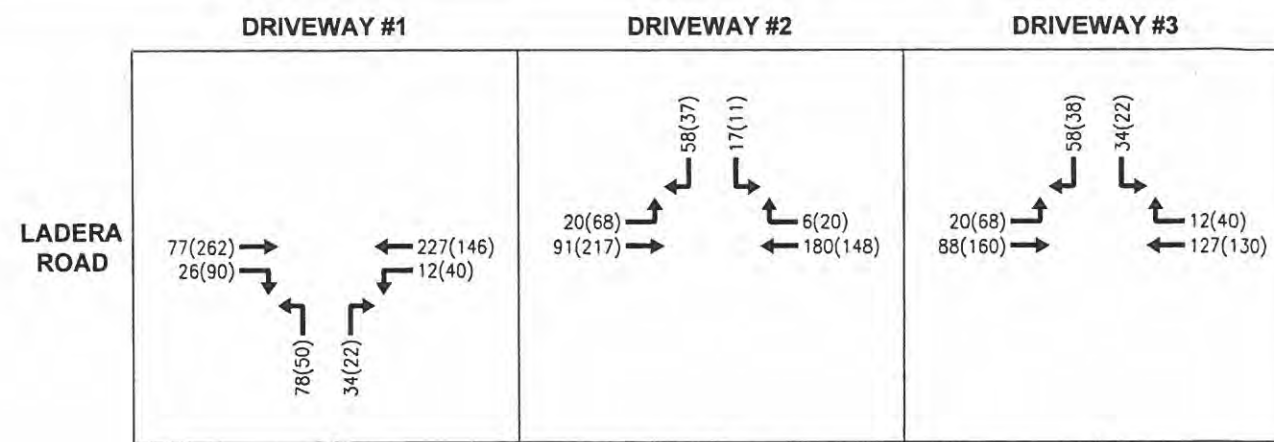
A peak hour traffic signal warrant analysis was conducted for the no build and build scenarios. They are included in Appendix H. The results suggest that a traffic signal is not warranted at the I-40 westbound to southbound intersection in the no build scenario, as the volume on the major street, 98th Street, is rather low and does not reach the minimum value of the curves established for the warrant. A similar condition exists for the build scenario, although the

through volume on 98th Street is higher due to the development traffic, the traffic volume on 98th Street still does not reach a level that exceed the minimum shown for major street traffic. Installation of a signal improves average delay (down to 10-11 seconds in the peak hours); however the westbound left queue is still in the 300-foot range. All-Way STOP Control was also considered but was discarded as the delay increases for the westbound left with an increase of approximately 100 feet in queue length. A traffic signal will be required at this location as more development occurs to the north, however it does not appear to be warranted at this time. This condition should be monitored in the event the 98th Street interchange is more attractive than that anticipated in this analysis.

The Eastbound ramp also has the eastbound left operating at LOS E, although as this is a relatively small volume movement it is considered acceptable.

The new intersection of Ladera and 98th Street/Arroyo Vista operates at an acceptable level of service as an AWSC intersection. Due to the fact that two legs of the intersection will have little to no traffic, it is anticipated that most drivers will, at best, roll to a stop, due to the low traffic on the other two legs. This will be particularly true for the northbound to eastbound right turn and with the channelization island constructed should be signed as a Yield condition. The analysis assumed a Stop condition for this movement. The westbound left is more problematic as there will be occasional traffic making a northbound left at the intersection. Analysis of no stop control for the westbound left and northbound right, with a stop required for northbound left or through, shows this movement would operate at LOS B worst case in either peak hour. However as driver expectancy will come to be no northbound lefts due to their infrequency, it is suggested that the westbound left be signed as a stop condition, with the realization that most drivers will likely ignore the requirement for a full, complete stop.

All project driveways operate at acceptable levels of service under the forecast traffic volumes.



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**FIGURE 7
2005 BUILD AM(PM)
PEAK HOUR TRAFFIC VOLUMES**

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

All the intersections in the study operate at acceptable levels of service with existing traffic, 2005 No-Build traffic, and 2005 Build traffic, except for the intersection of Ladera and Unser and the I-40 Westbound Off-Ramp left turn, that operates at LOS F. The addition of the Build traffic also has limited impact on the level of service at the intersections with existing or No-Build traffic, and with the opening of the 98th Street interchange with I-40 actually improves the operation of Ladera and Unser, although the intersection will continue to operate at LOS F, as in existing conditions and the 2006 no build.

Serious current deficiencies exist at the intersection of Ladera and Unser. Operations analysis show a current AM peak hour LOS F with an average delay of 242 seconds (4 minutes). An additional through lane on Unser as well as a third westbound left turn lane and a second eastbound right turn lane improves the LOS to E with a 62 second average delay. The average delay increases to 6 minutes with existing geometry in the 2006 no build. The level of improvements increase to a fourth through lane on Unser, in addition to the turn lanes above, to get to LOS E in the 2006 no build, with some movements still at LOS F. The build scenario improves delay over the no build due to the diversion of traffic to 98th Street however it still is LOS F with current geometry, with a 5½ minute average delay. The three through lanes on Unser with added turn lanes reduces delay to 111 seconds, a 66% improvement, however still LOS F.

B. Recommendations

The following recommendations are made:

Approve the Traffic Impact Study.

Developer to extend Ladera from Gavin to 98th Street/Arroyo Vista and 98th Street/Arroyo Vista from Ladera to existing pavement, including stub-outs for all legs of the 98th Street/Arroyo Vista and Ladera intersection. Full half section on north side of Ladera to be constructed from Gavin to 98th Street/Arroyo Vista. Full half section on south side to be constructed from 98th Street/Arroyo Vista to eastern edge of southern parcel. There will be a short section of Ladera that is not constructed as a 4-lane section at this time. This section will be constructed as these parcels develop. Ultimate section (6-lane) of 98th Street/Arroyo Vista constructed south to existing pavement.

Westbound left turn lane at 98th Street/Arroyo Vista & Ladera to be single left turn lane with STOP control until signal warranted by future development.

Northbound right turn at 98th Street/Arroyo Vista and Ladera to be single channelized lane with Yield control.

Monitor westbound off-ramp operation and queue. Install traffic signal when warranted by future development. To be determined by future traffic impact analyses with future developments.

All improvements to be designed to City of Albuquerque or New Mexico Department of Transportation standards as applicable.

APPENDIX A

CITY TRAFFIC STUDY SCOPING LETTER

APPENDIX B

EXISTING TURNING MOVEMENT COUNTS

MID-REGION COUNCIL OF GOVERNMENTS
 INTERSECTION TURNING MOVEMENT COUNT

MIDDLE RIO GRANDE COG
 Two Vehicle Analysis with Right on Red

Page: 1
 Date: 11/15/2002

Location: 025650

Notes : LADERA BD - UNSER BD

Study ID: 00

Operator: MM 168 AH 169

Weather : BERNALILLO

Starts : 11/12/02 at 06:45:00

Ends : 11/12/02 at 18:00:00

Interval : 15 min Intervals: 45

S/N : 168169 Type: C,Tr,Ped-rt/red

Correction: 1.00

		From North				From South				From East				From West				Interval
Begins		RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	Total
Tue 11/12/2002																		
6:45	Auto	0	13	310	0	12	7	65	21	2	95	11	6	1	7	10	55	615 <
	Truck	0	0	3	1	0	0	6	3	0	1	0	0	0	0	0	1	15
7:00	Auto	0	19	487	4	16	14	63	25	2	128	6	4	40	8	21	60	897 <
	Truck	0	0	4	0	0	2	4	6	0	6	2	0	0	0	0	0	24
7:15	Auto	0	13	517	4	21	17	64	32	1	179	14	6	10	16	26	92	1012 <
	Truck	0	0	2	0	0	1	4	3	0	3	0	0	0	0	0	0	13
7:30	Auto	0	22	591	2	25	18	96	43	3	158	28	7	6	9	24	157	1189 <
	Truck	0	0	5	0	4	2	9	7	0	4	3	1	0	0	0	1	36
7:45	Auto	0	21	653	4	27	31	64	48	2	187	32	9	11	3	33	116	1241 <
	Truck	0	0	3	0	0	2	6	5	0	3	3	1	0	0	0	3	26
8:00	Auto	0	14	392	7	27	35	78	32	2	151	14	4	7	9	22	85	879 <
	Truck	0	0	2	1	1	3	7	2	0	5	2	0	0	0	0	1	24
8:15	Auto	0	5	427	3	21	29	72	42	0	86	10	7	14	2	14	41	773 <
	Truck	0	0	5	0	0	5	7	1	0	1	2	0	1	0	0	1	23
8:30	Auto	0	9	197	8	29	31	57	33	0	92	16	6	12	6	22	29	547 <
	Truck	0	0	3	0	1	2	4	4	0	2	1	1	0	0	0	2	20
8:45	Auto	0	10	149	9	31	59	51	36	0	71	18	4	8	8	17	35	506 <
	Truck	0	0	4	4	2	12	3	2	0	2	0	2	0	0	0	12	43
9:00	Auto	0	6	131	16	20	82	55	39	1	47	24	5	19	17	36	51	549 <
	Truck	0	1	7	0	0	1	10	2	0	1	1	2	1	0	0	5	31
9:15	Auto	0	10	120	4	11	18	59	24	2	45	9	4	4	5	33	48	396 <
	Truck	0	0	2	1	2	2	3	2	0	1	0	0	0	0	0	1	14
9:30	Auto	0	5	61	1	5	10	47	34	2	46	17	8	3	2	7	18	266 <
	Truck	0	0	3	0	0	1	3	2	0	0	0	0	0	0	0	2	11
9:45	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	Auto	1	5	39	3	11	12	49	25	1	32	15	7	4	2	8	13	227 <
	Truck	0	0	1	1	1	0	6	0	0	4	2	0	0	0	2	2	19
11:15	Auto	0	8	60	3	8	14	51	27	0	34	15	7	4	1	3	12	247 <
	Truck	0	0	2	0	1	1	3	1	0	3	2	1	0	0	0	2	16
11:30	Auto	0	4	67	9	12	28	57	32	3	55	10	5	4	3	2	16	307 <
	Truck	0	1	2	0	0	0	1	5	1	3	1	2	0	0	0	0	16

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 3
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

		From North				From South				From East				From West				Interval
		-----				-----				-----				-----				
Begins		RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	Total

Tue 11/12/2002																		
17:00	Auto	0	3	120	2	42	49	223	78	3	61	21	11	8	4	34	45	704 <
	Truck	0	0	6	0	0	0	3	1	1	1	0	1	0	1	0	1	15
17:15	Auto	0	24	117	9	68	72	256	83	1	74	19	14	6	11	21	21	796 <
	Truck	0	0	1	2	2	1	5	0	0	1	1	0	0	0	0	2	15
17:30	Auto	0	26	164	6	36	36	295	70	0	52	35	14	2	9	35	26	806 <
	Truck	0	0	3	0	0	0	3	1	0	0	0	1	0	0	0	1	9
17:45	Auto	0	23	134	20	41	55	193	104	4	48	19	19	5	8	19	29	721 <
	Truck	0	0	4	0	0	1	2	1	0	3	0	0	0	0	0	2	13

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 5
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

TOTAL INTERSECTION PEAK HOUR ANALYSIS

Total Intersection Peak is: Tue Nov 12 07:00:00 2002

DIRECTION	VOLUME						Peak Factor	PERCENTS				
	Peds	Rt/Red	Left	Thru	Right	Total		Rt/Red	Left	Thru	Right	Total
From North	0	0	75	2262	14	2351	0.86	0.0%	3.2%	96.2%	0.6%	100.0%
From South	0	93	87	310	169	659	0.81	14.1%	13.2%	47.0%	25.6%	100.0%
From East	0	8	668	88	28	792	0.84	1.0%	84.3%	11.1%	3.5%	100.0%
From West	0	67	36	104	429	636	0.81	10.5%	5.7%	16.4%	67.5%	100.0%
Totals	0	168	866	2764	640	4438	0.88	3.8%	19.5%	62.3%	14.4%	100.0%

		From North									
		Total 2733									
		Approach 2351		Depart 382							
		Rt/red Right Thru Left									
		0 14 2262 75		36 310 36							
		14						8 Rt/Red			
		28						28 Right			
Depart 189		88						88 Thru Approach 792			
		87						668 Left			
Total 825				N							
From West				W + E						Total 1233	
				S							
								From East			
		Left 36						75			
Approach 636		Thru 104						104		Depart 441	
		Right 429						262			
		Rt/Red 67									
		496 2262 668		87 310 169 93							
				Left Thru Right Rt/Red							
		Depart 3426		Approach 659							
				Total 4085							
				From South							

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 2
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

TOTAL INTERSECTION PEAK HOUR ANALYSIS

Total Intersection Peak is: Tue Nov 12 16:45:00 2002

DIRECTION	VOLUME						Peak Factor	PERCENTS				
	Peds	Rt/Red	Left	Thru	Right	Total		Rt/Red	Left	Thru	Right	Total
From North	0	1	67	549	28	645	0.81	0.2%	10.4%	85.1%	4.3%	100.0%
From South	0	182	229	1029	368	1808	0.93	10.1%	12.7%	56.9%	20.4%	100.0%
From East	0	6	257	97	59	419	0.95	1.4%	61.3%	23.2%	14.1%	100.0%
From West	0	18	34	102	121	275	0.74	6.5%	12.4%	37.1%	44.0%	100.0%
Totals	0	207	587	1777	576	3147	0.97	6.6%	18.7%	56.5%	18.3%	100.0%

		From North			
		Total 1773			
		Approach 645		Depart 1128	
		Rt/red Right Thru Left			
		1 28 549 67		34 1029 65	
				6 Rt/Red	
		29		59 Right	
Depart 355		97		97 Thru Approach 419	
		229		257 Left	
Total 630		N		Total 1138	
From West		W + E		From East	
		S			
		Left 34		67	
Approach 275		Thru 102		102 Depart 719	
		Right 121		550	
		Rt/Red 18			
		139 549 257		229 1029 368 182	
		Left Thru Right Rt/Red			
		Depart 945		Approach 1808	
		Total 2753			
		From South			

APPENDIX C

2003 INTERSECTION CAPACITY ANALYSIS

TABLE 1 – 2003 EXISTING SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS						
Signalized Intersections	AM Peak			PM Peak		
	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	242.1	1.30	F	29.1	0.57	C
Add 3 rd N/S Thru	152.2	1.08	F			
Plus 3 rd WB Left & 2 nd WB Right	62.5	0.88	E			

TABLE 2 – 2003 EXISTING UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Movement	AM Peak				PM Peak			
	Delay	v/c	Queue (veh)	LOS	Delay	v/c	Queue (veh)	LOS
98 th St. and I-40 WB Ramps								
WB Left	10.2	0.208	1	B	21.3	0.736	7	C
NB Left	7.3	0.028	<1	A	7.3	0.048	<1	A
98 th St. and I-40 EB Ramp								
EB Right	9.6	0.051	<1	A	14.2	0.148	1	B

WESTLAND TRACT I
EXISTING 2003 CONDITIONS
Ladera & Unser, AM PEAK

08/04/03
15:49:46

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser

Degree of Saturation (v/c) 1.30 Vehicle Delay 242.1 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
North / \		* * + * * + <* * +> v		^ ++++ <++++
	^ <+ + +> **** + + + v + + +	^ <+ + +> + + + + + +	^ ++++ v +> + +	^ ++++ ++++> **** v
	G/C=0.098 G= 11.7" Y+R= 4.0" OFF= 0.0%	G/C=0.486 G= 58.4" Y+R= 4.0" OFF=13.1%	G/C=0.150 G= 18.0" Y+R= 4.0" OFF=65.1%	G/C=0.133 G= 15.9" Y+R= 4.0" OFF=83.4%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
---------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach

295.2 F

RT+TH	24/2	0.768	0.486	1525	1720	2755	1.602	304.4	*F	4746 ft
LT	12/1	0.302	0.486	350	470	91	0.194	18.4	B	89 ft

S Approach

10.2 B+

RT	12/1	0.365	0.801	1258	1268	336	0.265	3.5	A	152 ft
TH	24/2	0.291	0.617	2117	2185	396	0.181	10.1	B+	149 ft
LT	12/1	0.082	0.098	128	217	111	0.472	31.1	C	112 ft

E Approach

289.0 F

RT+TH	12/1	0.285	0.133	1	201	152	0.641	61.9	E+	237 ft
LT	24/2	0.362	0.150	1	491	825	1.602	330.9	*F	1383 ft

W Approach

240.1 F

RT	12/1	0.493	0.264	73	403	637	1.528	293.5	*F	1927 ft
TH	12/1	0.277	0.133	1	211	133	0.538	56.8	E+	203 ft
LT	12/1	0.098	0.150	162	365	46	0.124	29.9	C	57 ft

WESTLAND TRACT I
 EXISTING 2003 CONDITIONS - Add 3rd N/S Thru
 Ladera & Unser, AM PEAK - & 3rd WB L, 2nd EB R

08/04/03
 15:55:54

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 0.88 Vehicle Delay 62.5 Level of Service E+

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
 North		* * + * * + <* * +> V		^ ++++ <++++
			^ *****	^
	^ <+ + +> ***** + + + V + + +	^ <+ + +> + + + + + +	++++ V +> + +	++++ ++++> **** V
	G/C=0.056 G= 6.7" Y+R= 4.0" OFF= 0.0%	G/C=0.503 G= 60.4" Y+R= 4.0" OFF= 8.9%	G/C=0.164 G= 19.7" Y+R= 4.0" OFF=62.5%	G/C=0.144 G= 17.3" Y+R= 4.0" OFF=82.3%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
---------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach

71.2 E

RT+TH	36/3	0.564	0.503	2367	2555	2755	1.078	73.0	*E	2255 ft
LT	12/1	0.304	0.503	365	478	91	0.190	17.3	B	87 ft

S Approach

13.0 B+

RT	12/1	0.365	0.789	1236	1250	336	0.269	3.9	A	159 ft
TH	36/3	0.272	0.592	2934	3011	396	0.132	10.9	B+	110 ft
LT	12/1	0.082	0.056	73	144	111	0.689	48.3	D	148 ft

E Approach

73.3 E

RT+TH	12/1	0.285	0.144	1	222	152	0.591	57.7	E+	231 ft
LT	36/3	0.312	0.164	1	839	825	0.979	76.2	*E	547 ft

W Approach

70.0 E

RT	24/2	0.359	0.233	1	647	637	0.980	76.5	*E	772 ft
TH	12/1	0.277	0.144	1	234	133	0.496	53.8	D	198 ft
LT	12/1	0.087	0.164	219	410	46	0.112	27.7	C	55 ft

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

All the intersections in the study operate at acceptable levels of service with existing traffic, 2005 No-Build traffic, and 2005 Build traffic, except for the intersection of Ladera and Unser and the I-40 Westbound Off-Ramp left turn, that operates at LOS F. The addition of the Build traffic also has limited impact on the level of service at the intersections with existing or No-Build traffic, and with the opening of the 98th Street interchange with I-40 actually improves the operation of Ladera and Unser, although the intersection will continue to operate at LOS F, as in existing conditions and the 2006 no build.

Serious current deficiencies exist at the intersection of Ladera and Unser. Operations analysis show a current AM peak hour LOS F with an average delay of 242 seconds (4 minutes). An additional through lane on Unser as well as a third westbound left turn lane and a second eastbound right turn lane improves the LOS to E with a 62 second average delay. The average delay increases to 6 minutes with existing geometry in the 2006 no build. The level of improvements increase to a fourth through lane on Unser, in addition to the turn lanes above, to get to LOS E in the 2006 no build, with some movements still at LOS F. The build scenario improves delay over the no build due to the diversion of traffic to 98th Street however it still is LOS F with current geometry, with a 5½ minute average delay. The three through lanes on Unser with added turn lanes reduces delay to 111 seconds, a 66% improvement, however still LOS F.

B. Recommendations

The following recommendations are made:

Approve the Traffic Impact Study.

Developer to extend Ladera from Gavin to 98th Street/Arroyo Vista and 98th Street/Arroyo Vista from Ladera to existing pavement, including stub-outs for all legs of the 98th Street/Arroyo Vista and Ladera intersection. Full half section on north side of Ladera to be constructed from Gavin to 98th Street/Arroyo Vista. Full half section on south side to be constructed from 98th Street/Arroyo Vista to eastern edge of southern parcel. There will be a short section of Ladera that is not constructed as a 4-lane section at this time. This section will be constructed as these parcels develop. Ultimate section (6-lane) of 98th Street/Arroyo Vista constructed south to existing pavement.

Westbound left turn lane at 98th Street/Arroyo Vista & Ladera to be single left turn lane with STOP control until signal warranted by future development.

Northbound right turn at 98th Street/Arroyo Vista and Ladera to be single channelized lane with Yield control.

Monitor westbound off-ramp operation and queue. Install traffic signal when warranted by future development. To be determined by future traffic impact analyses with future developments.

All improvements to be designed to City of Albuquerque or New Mexico Department of Transportation standards as applicable.

APPENDIX A

CITY TRAFFIC STUDY SCOPING LETTER

APPENDIX B

EXISTING TURNING MOVEMENT COUNTS

MID-REGION COUNCIL OF GOVERNMENTS
INTERSECTION TURNING MOVEMENT COUNT

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 1
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

		From North				From South				From East				From West				Interval
Begins		RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	Total
Tue 11/12/2002																		
6:45	Auto	0	13	310	0	12	7	65	21	2	95	11	6	1	7	10	55	615 <
	Truck	0	0	3	1	0	0	6	3	0	1	0	0	0	0	0	1	15
7:00	Auto	0	19	487	4	16	14	63	25	2	128	6	4	40	8	21	60	897 <
	Truck	0	0	4	0	0	2	4	6	0	6	2	0	0	0	0	0	24
7:15	Auto	0	13	517	4	21	17	64	32	1	179	14	6	10	16	26	92	1012 <
	Truck	0	0	2	0	0	1	4	3	0	3	0	0	0	0	0	0	13
7:30	Auto	0	22	591	2	25	18	96	43	3	158	28	7	6	9	24	157	1189 <
	Truck	0	0	5	0	4	2	9	7	0	4	3	1	0	0	0	1	36
7:45	Auto	0	21	653	4	27	31	64	48	2	187	32	9	11	3	33	116	1241 <
	Truck	0	0	3	0	0	2	6	5	0	3	3	1	0	0	0	3	26
8:00	Auto	0	14	392	7	27	35	78	32	2	151	14	4	7	9	22	85	879 <
	Truck	0	0	2	1	1	3	7	2	0	5	2	0	0	0	0	1	24
8:15	Auto	0	5	427	3	21	29	72	42	0	86	10	7	14	2	14	41	773 <
	Truck	0	0	5	0	0	5	7	1	0	1	2	0	1	0	0	1	23
8:30	Auto	0	9	197	8	29	31	57	33	0	92	16	6	12	6	22	29	547 <
	Truck	0	0	3	0	1	2	4	4	0	2	1	1	0	0	0	2	20
8:45	Auto	0	10	149	9	31	59	51	36	0	71	18	4	8	8	17	35	506 <
	Truck	0	0	4	4	2	12	3	2	0	2	0	2	0	0	0	12	43
9:00	Auto	0	6	131	16	20	82	55	39	1	47	24	5	19	17	36	51	549 <
	Truck	0	1	7	0	0	1	10	2	0	1	1	2	1	0	0	5	31
9:15	Auto	0	10	120	4	11	18	59	24	2	45	9	4	4	5	33	48	396 <
	Truck	0	0	2	1	2	2	3	2	0	1	0	0	0	0	0	1	14
9:30	Auto	0	5	61	1	5	10	47	34	2	46	17	8	3	2	7	18	266 <
	Truck	0	0	3	0	0	1	3	2	0	0	0	0	0	0	0	2	11
9:45	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
	Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	Auto	1	5	39	3	11	12	49	25	1	32	15	7	4	2	8	13	227 <
	Truck	0	0	1	1	1	0	6	0	0	4	2	0	0	0	2	2	19
11:15	Auto	0	8	60	3	8	14	51	27	0	34	15	7	4	1	3	12	247 <
	Truck	0	0	2	0	1	1	3	1	0	3	2	1	0	0	0	2	16
11:30	Auto	0	4	67	9	12	28	57	32	3	55	10	5	4	3	2	16	307 <
	Truck	0	1	2	0	0	0	1	5	1	3	1	2	0	0	0	0	16

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 2
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

Begins	From North				From South				From East				From West				Interval
	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	Total
Tue 11/12/2002																	
11:45 Auto	0	4	50	2	10	34	67	40	2	36	6	2	4	5	18	24	304 <
Truck	0	0	2	0	2	5	1	4	0	0	0	1	0	0	0	1	16
12:00 Auto	0	8	53	0	19	36	81	36	2	41	17	2	5	2	17	20	339 <
Truck	0	0	3	0	1	4	5	1	0	2	1	0	1	0	1	3	22
12:15 Auto	0	11	64	0	10	20	78	44	2	28	16	4	3	2	11	19	312 <
Truck	0	0	1	0	1	6	6	1	0	0	0	0	0	0	0	1	16
12:30 Auto	0	7	42	3	20	28	58	30	4	49	16	4	10	1	18	28	318 <
Truck	0	0	1	1	1	10	4	4	0	4	3	1	0	0	0	0	29
12:45 Auto	0	6	73	4	12	40	62	34	1	58	15	10	3	4	18	20	360 <
Truck	0	0	4	0	1	2	2	0	1	3	0	0	1	0	0	0	14
13:00 Auto	0	8	59	2	16	22	72	41	0	43	10	3	1	4	11	28	320 <
Truck	0	0	1	0	0	2	0	3	0	1	0	0	0	0	2	1	10
13:15 Auto	1	10	64	5	14	21	51	30	2	35	13	5	4	2	14	13	284 <
Truck	0	0	1	0	0	1	3	2	0	3	1	2	0	0	1	0	14
13:30 Auto	1	7	53	2	10	23	74	45	3	41	13	3	2	0	16	28	321 <
Truck	0	0	1	0	1	0	1	1	0	2	0	1	1	0	0	2	10
13:45 Auto	1	8	82	1	14	29	70	52	1	39	11	5	2	2	11	15	343 <
Truck	0	0	4	0	1	5	3	0	0	1	0	0	0	0	1	3	18
14:00 Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15 Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30 Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45 Auto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 <
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00 Auto	0	7	80	3	8	22	102	64	2	60	20	9	2	9	10	18	416 <
Truck	0	0	6	0	0	3	9	1	0	3	2	0	0	0	0	0	24
15:15 Auto	5	11	65	7	14	42	156	78	0	49	21	9	2	5	6	16	486 <
Truck	0	0	1	0	0	3	5	6	1	2	0	0	0	2	0	4	24
15:30 Auto	2	12	83	8	7	74	151	54	0	47	36	15	4	9	10	29	541 <
Truck	0	1	3	3	0	8	8	0	0	2	2	0	0	0	0	4	31
15:45 Auto	0	11	122	3	20	51	150	60	4	41	17	11	2	20	54	61	627 <
Truck	0	0	2	1	0	3	4	1	0	2	0	1	0	2	1	8	25
16:00 Auto	0	14	159	1	27	50	161	63	1	73	22	12	3	17	48	59	710 <
Truck	0	0	16	0	1	2	8	0	0	7	2	1	0	3	2	7	49
16:15 Auto	0	12	130	6	16	44	199	79	2	61	21	7	5	20	28	9	639 <
Truck	0	1	2	0	0	1	7	3	1	4	1	1	0	0	0	4	25
16:30 Auto	0	29	135	9	43	49	189	100	2	79	22	10	3	14	11	13	708 <
Truck	0	0	4	1	1	1	5	5	0	0	0	1	0	0	0	0	18
16:45 Auto	1	14	133	9	31	69	240	132	1	61	21	18	2	8	12	24	776 <
Truck	0	0	5	0	3	2	4	3	0	7	0	0	0	1	0	1	26

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 3
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

		From North				From South				From East				From West				Interval
Begins		RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	RtRed	Left	Thru	Right	Total
Due 11/12/2002																		
17:00	Auto	0	3	120	2	42	49	223	78	3	61	21	11	8	4	34	45	704 <
	Truck	0	0	6	0	0	0	3	1	1	1	0	1	0	1	0	1	15
17:15	Auto	0	24	117	9	68	72	256	83	1	74	19	14	6	11	21	21	796 <
	Truck	0	0	1	2	2	1	5	0	0	1	1	0	0	0	0	2	15
17:30	Auto	0	26	164	6	36	36	295	70	0	52	35	14	2	9	35	26	806 <
	Truck	0	0	3	0	0	0	3	1	0	0	0	1	0	0	0	1	9
17:45	Auto	0	23	134	20	41	55	193	104	4	48	19	19	5	8	19	29	721 <
	Truck	0	0	4	0	0	1	2	1	0	3	0	0	0	0	0	2	13

Two Vehicle Analysis with Right on Red

Date: 11/15/2002

Correction: 1.00

2

From South

Page: 5
Date: 11/15/2002

TOTAL INTERSECTION PEAK HOUR ANALYSIS

DIRECTION	VOLUME						Peak Factor	PERCENTS				
	Peds	Rt/Red	Left	Thru	Right	Total		Rt/Red	Left	Thru	Right	Total
From North	0	0	75	2262	14	2351	0.86	0.0%	3.2%	96.2%	0.6%	100.0%
From South	0	93	87	310	169	659	0.81	14.1%	13.2%	47.0%	25.6%	100.0%
From East	0	8	668	88	28	792	0.84	1.0%	84.3%	11.1%	3.5%	100.0%
From West	0	67	36	104	429	636	0.81	10.5%	5.7%	16.4%	67.5%	100.0%
Totals	0	168	866	2764	640	4438	0.88	3.8%	19.5%	62.3%	14.4%	100.0%

[illegible]

MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 2
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

TOTAL INTERSECTION PEAK HOUR ANALYSIS

Total Intersection Peak is: Tue Nov 12 12:00:00 2002

DIRECTION	VOLUME						Peak Factor	PERCENTS				
	Peds	Rt/Red	Left	Thru	Right	Total		Rt/Red	Left	Thru	Right	Total
From North	0	0	32	241	8	281	0.81	0.0%	11.4%	85.8%	2.8%	100.0%
From South	0	65	146	296	150	657	0.90	9.9%	22.2%	45.1%	22.8%	100.0%
From East	0	10	185	68	21	284	0.81	3.5%	65.1%	23.9%	7.4%	100.0%
From West	0	23	9	65	91	188	0.82	12.2%	4.8%	34.6%	48.4%	100.0%
Totals	0	98	372	670	270	1410	0.94	7.0%	26.4%	47.5%	19.1%	100.0%

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MIDDLE RIO GRANDE COG
Two Vehicle Analysis with Right on Red

Page: 2
Date: 11/15/2002

Location: 025650 Starts : 11/12/02 at 06:45:00
Notes : LADERA BD - UNSER BD Ends : 11/12/02 at 18:00:00
Study ID: 00 Interval : 15 min Intervals: 45
Operator: MM 168 AH 169 S/N : 168169 Type: C,Tr,Ped-rt/red
Weather : BERNALILLO Correction: 1.00

TOTAL INTERSECTION PEAK HOUR ANALYSIS

Total Intersection Peak is: Tue Nov 12 16:45:00 2002

DIRECTION	VOLUME						Peak Factor	PERCENTS				
	Peds	Rt/Red	Left	Thru	Right	Total		Rt/Red	Left	Thru	Right	Total
From North	0	1	67	549	28	645	0.81	0.2%	10.4%	85.1%	4.3%	100.0%
From South	0	182	229	1029	368	1808	0.93	10.1%	12.7%	56.9%	20.4%	100.0%
From East	0	6	257	97	59	419	0.95	1.4%	61.3%	23.2%	14.1%	100.0%
From West	0	18	34	102	121	275	0.74	6.5%	12.4%	37.1%	44.0%	100.0%
Totals	0	207	587	1777	576	3147	0.97	6.6%	18.7%	56.5%	18.3%	100.0%

		From North			
		Total 1773			
		Approach 645		Depart 1128	
		Rt/red Right Thru Left			
		1 28 549 67		34 1029 65	
				6 Rt/Red	
		29		59 Right	
Depart 355		97		97 Thru Approach 419	
		229		257 Left	
Total 630		N		Total 1138	
From West		W + E		From East	
		S			
		Left 34		67	
Approach 275		Thru 102		102 Depart 719	
		Right 121		550	
		Rt/Red 18			
		139 549 257		229 1029 368 182	
				Left Thru Right Rt/Red	
		Depart 945		Approach 1808	
		Total 2753			
		From South			

7229
9216

VEHICLE VOLUME SUMMARY SHEET

LOCATION 98th St and I-40 DATE 5/20/03 DAY Tuesday

TIME PERIOD	STREET 98th to I-40						STREET TOTAL	STREET I-40 Exits to 98th						STREET TOTAL	INTERSECTION TOTAL
	SOUTHBOUND			NORTHBOUND				EASTBOUND			WESTBOUND				
				 on West		 on East		 off East			 off West				
6:30-6:45				6		302		4			41			353	
6:45-7:00				8		258		5			71			342	
7:00-7:15				10		245		10			56			321	
7:15-7:30				9		250		10			76			345	
7:30-7:45				8		305		5			90			408	
7:45-8:00				13		211		13			106			343	
8:00-8:15				13		171		10			83			277	
8:15-8:30				13		153		14			82			262	
8:30-8:45				14		155		8			60			237	
8:45-9:00				15		131		11			73			230	
4:00-4:15				20		99		14			206			339	
4:15-4:30				21		65		22			244			332	
4:30-4:45				21		112		12			208			353	
4:45-5:00				24		90		21			229			367	
5:00-5:15				20		113		11			234			378	
5:15-5:30				15		116		12			301			444	
5:30-5:45				10		129		17			271			427	
5:45-6:00				21		102		13			207			343	
6:00-6:15				18		96		9			255			378	
6:15-6:30				12		97		14			203			306	
TOTAL															

Am-Peak

Pm-Peak

APPENDIX C

2003 INTERSECTION CAPACITY ANALYSIS

TABLE 1 – 2003 EXISTING SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS						
Signalized Intersections	AM Peak			PM Peak		
	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	242.1	1.30	F	29.1	0.57	C
Add 3 rd N/S Thru	152.2	1.08	F			
Plus 3 rd WB Left & 2 nd WB Right	62.5	0.88	E			

TABLE 2 – 2003 EXISTING UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Movement	AM Peak				PM Peak			
	Delay	v/c	Queue (veh)	LOS	Delay	v/c	Queue (veh)	LOS
98 th St. and I-40 WB Ramps								
WB Left	10.2	0.208	1	B	21.3	0.736	7	C
NB Left	7.3	0.028	<1	A	7.3	0.048	<1	A
98 th St. and I-40 EB Ramp								
EB Right	9.6	0.051	<1	A	14.2	0.148	1	B

WESTLAND TRACT I
 EXISTING 2003 CONDITIONS
 Ladera & Unser, AM PEAK

08/04/03
 15:49:46

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 1.30 Vehicle Delay 242.1 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
		* * + * * + <* * +> V		^ ++++ <++++
			^ ***** ++++ V	^ ++++
	<+ + +> ***** + + + V + + +	<+ + +> + + + + + +	+> + +	++++> ***** V
	G/C=0.098 G= 11.7" Y+R= 4.0" OFF= 0.0%	G/C=0.486 G= 58.4" Y+R= 4.0" OFF=13.1%	G/C=0.150 G= 18.0" Y+R= 4.0" OFF=65.1%	G/C=0.133 G= 15.9" Y+R= 4.0" OFF=83.4%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C		Service Rate		Adj	v/c	HCM Delay	L S	Queue Model 1
		Reqd	Used	@C (vph)	@E	Volume				

N Approach

295.2 F

RT+TH	24/2	0.768	0.486	1525	1720	2755	1.602	304.4	*F	4746 ft
LT	12/1	0.302	0.486	350	470	91	0.194	18.4	B	89 ft

S Approach

10.2 B+

RT	12/1	0.365	0.801	1258	1268	336	0.265	3.5	A	152 ft
TH	24/2	0.291	0.617	2117	2185	396	0.181	10.1	B+	149 ft
LT	12/1	0.082	0.098	128	217	111	0.472	31.1	C	112 ft

E Approach

289.0 F

RT+TH	12/1	0.285	0.133	1	201	152	0.641	61.9	E+	237 ft
LT	24/2	0.362	0.150	1	491	825	1.602	330.9	*F	1383 ft

W Approach

240.1 F

RT	12/1	0.493	0.264	73	403	637	1.528	293.5	*F	1927 ft
TH	12/1	0.277	0.133	1	211	133	0.538	56.8	E+	203 ft
LT	12/1	0.098	0.150	162	365	46	0.124	29.9	C	57 ft

WESTLAND TRACT I
 EXISTING 2003 CONDITIONS - Add 3rd N/S Thru
 Ladera & Unser, AM PEAK

08/04/03
 15:52:46

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser

Degree of Saturation (v/c) 1.08 Vehicle Delay 152.2 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
. / \ North 		* * + * * + <* * +> V		^ ++++ <++++
			^ ***** ++++ V	^ ++++
	<+ + +> **** + + + V + + +	<+ + +> + + + + + +	+> + +	++++> **** V
	G/C=0.118 G= 14.1" Y+R= 4.0" OFF= 0.0%	G/C=0.408 G= 49.0" Y+R= 4.0" OFF=15.1%	G/C=0.181 G= 21.7" Y+R= 4.0" OFF=59.2%	G/C=0.160 G= 19.2" Y+R= 4.0" OFF=80.7%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used		Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
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N Approach

181.8 F

RT+TH	36/3	0.564	0.408	1682	2073	2755	1.329	187.0	*F	2906 ft
LT	12/1	0.304	0.408	237	386	91	0.235	24.7	C+	102 ft

S Approach

11.4 B+

RT	12/1	0.365	0.773	1205	1224	336	0.275	4.5	A	168 ft
TH	36/3	0.272	0.559	2730	2843	396	0.139	12.8	B+	117 ft
LT	12/1	0.081	0.118	157	256	111	0.411	27.6	C	114 ft

E Approach

183.8 F

RT+TH	12/1	0.285	0.160	1	253	152	0.533	53.3	D	224 ft
LT	24/2	0.362	0.181	1	608	825	1.329	207.9	*F	1159 ft

W Approach

156.7 F

RT	12/1	0.493	0.311	199	489	637	1.295	188.4	*F	1614 ft
TH	12/1	0.277	0.160	1	266	133	0.446	50.4	D	193 ft
LT	12/1	0.072	0.181	292	463	46	0.099	24.9	C+	52 ft

WESTLAND TRACT I
 EXISTING 2003 CONDITIONS - Add 3rd N/S Thru
 Ladera & Unser, AM PEAK - & 3rd WB L, 2nd EB R

08/04/03
 15:55:54

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 0.88 Vehicle Delay 62.5 Level of Service E+

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
/ \ North 		* * + * * + <* * +> v		^ ++++ <++++
	^ <+ + +> **** + + + v + + +	^ <+ + +> + + + + + +	^ ***** ++++ v +> + + +	^ ++++ ++++> **** v
	G/C=0.056 G= 6.7" Y+R= 4.0" OFF= 0.0%	G/C=0.503 G= 60.4" Y+R= 4.0" OFF= 8.9%	G/C=0.164 G= 19.7" Y+R= 4.0" OFF=62.5%	G/C=0.144 G= 17.3" Y+R= 4.0" OFF=82.3%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
---------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach 71.2 E

RT+TH	36/3	0.564	0.503	2367	2555	2755	1.078	73.0	*E	2255 ft
LT	12/1	0.304	0.503	365	478	91	0.190	17.3	B	87 ft

S Approach 13.0 B+

RT	12/1	0.365	0.789	1236	1250	336	0.269	3.9	A	159 ft
TH	36/3	0.272	0.592	2934	3011	396	0.132	10.9	B+	110 ft
LT	12/1	0.082	0.056	73	144	111	0.689	48.3	D	148 ft

E Approach 73.3 E

RT+TH	12/1	0.285	0.144	1	222	152	0.591	57.7	E+	231 ft
LT	36/3	0.312	0.164	1	839	825	0.979	76.2	*E	547 ft

W Approach 70.0 E

RT	24/2	0.359	0.233	1	647	637	0.980	76.5	*E	772 ft
TH	12/1	0.277	0.144	1	234	133	0.496	53.8	D	198 ft
LT	12/1	0.087	0.164	219	410	46	0.112	27.7	C	55 ft

WESTLAND TRACT I
 EXISTING 2003 CONDITIONS
 Ladera & Unser, PM PEAK

08/04/03
 15:49:57

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 0.57 Vehicle Delay 29.1 Level of Service C

Sq 42 **/**	Phase 1	Phase 2	Phase 3	Phase 4
. / \	*	+ + +	^	^
	*	+ + +	++++	++++
	*>	<+ + +>	<++++	<++++
		v	****	^
North		^	v	++++
	<+	<+ * +>	+>	****>
	++++ +	+ * +	+	++++
	v +	+ * +	+	v
	G/C=0.055	G/C=0.447	G/C=0.176	G/C=0.189
	G= 6.6"	G= 53.7"	G= 21.1"	G= 22.7"
	Y+R= 4.0"	Y+R= 4.0"	Y+R= 4.0"	Y+R= 4.0"
	OFF= 0.0%	OFF= 8.8%	OFF=56.9%	OFF=77.8%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach 24.6 C+

RT+TH	24/2	0.345	0.447	1322	1571	743	0.473	24.3	C+	412 ft
LT	12/1	0.034	0.055	120	185	86	0.453	27.0	*C+	98 ft

S Approach 26.4 C+

RT	12/1	0.482	0.656	976	1039	613	0.590	14.0	B+	522 ft
TH	24/2	0.412	0.447	1333	1583	1147	0.725	30.0	*C	772 ft
LT	12/1	0.062	0.055	239	322	255	0.792	39.8	D+	353 ft

E Approach 38.5 D+

RT+TH	12/1	0.295	0.398	473	697	177	0.254	25.1	C+	187 ft
LT	24/2	0.277	0.176	1	588	281	0.466	47.0	*D	209 ft

W Approach 42.2 D+

RT	12/1	0.310	0.277	109	428	196	0.446	39.0	D+	251 ft
TH	12/1	0.280	0.189	1	326	143	0.406	46.2	*D	199 ft
LT	12/1	0.262	0.189	1	197	47	0.207	43.1	D+	69 ft

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM EXISTING 2003
 Comment 2003 EXISTING CONDITIONS

Site Information

Jurisdiction/Date COA 8/5/2003
 Major Street 98TH ST.
 Minor Street I-40 WB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R			R					
Lane 2	T			T			L					
Lane 3	L			T			L					
	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)	40	0			0	0	328		0			
PHF	.9	.9			.9	.9	.9		.9			
Proportion of heavy vehicles, HV	3	3			3	3	3		3			
Flow rate	44	0			0	0	364		0			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	R	2	1079	.002	<1	8.3	A	10.2 B
	2	L	182	874	.208	1	10.2	B	
	3	L	182	874	.208	1	10.2	B	
EB	1								
	2								
	3								
		①	44	1613	.028	<1	7.3	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM EXISTING 2003
 Comment 2003 EXISTING CONDITIONS

Site Information

Jurisdiction/Date COA 8/5/2003
 Major Street 98TH ST.
 Minor Street I-40 WB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R			R					
Lane 2	T			T			L					
Lane 3	L			T			L					
	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)	69	0			0	0	1035		0			
PHF	.9	.9			.9	.9	.9		.9			
Proportion of heavy vehicles, HV	3	3			3	3	3		3			
Flow rate	77	0			0	0	1150		0			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft
 Length of study period (h) .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	R	2	1079	.002	<1	8.3	A	21.3 C
	2	L	575	781	.736	7	21.3	C	
	3	L	575	781	.736	7	21.3	C	
EB	1								
	2								
	3								
		①	77	1613	.048	<1	7.3	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM EXISTING 2003
 Comment EXISTING CONDITIONS, 2003

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street 98TH ST.
 Minor Street I-40 EB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	R			R						R		
Lane 2	T			T						T		
Lane 3	T			T						L		
	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)		40	1011		328	0				0	0	38
PHF		.9	.9		.9	.9				.9	.9	.9
Proportion of heavy vehicles, HV		3	3		3	3				3	3	3
Flow rate		44	1123		364	0				0	0	42
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	42	826	.051	<1	9.6	A	9.6
	2	T				<1			
	3	L				<1			
		①							
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	<u>AY</u>	Jurisdiction/Date	<u>COA</u> <u>7/21/2003</u>
Agency or Company	<u>BHI</u>	Major Street	<u>98TH ST.</u>
Analysis Period/Year	<u>PM EXISTING</u> <u>2003</u>	Minor Street	<u>I-40 EB RAMPS</u>
Comment	<u>EXISTING CONDITIONS, 2003</u>		

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	R			R						R		
Lane 2	T			T						T		
Lane 3	T			T						L		
	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)		69	451		1035	0				0	0	61
PHF		.9	.9		.9	.9				.9	.9	.9
Proportion of heavy vehicles, HV		3	3		3	3				3	3	3
Flow rate		77	501		1150	0				0	0	68
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft
 Length of study period (h) .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	68	459	.148	1	14.2	B	14.2
	2	T				<1			
	3	L				<1			
		①							
		④							

APPENDIX D

GROWTH RATES

Westland Tract I Growth Rate Determination

AWDT on Unser
(North of Ladera)

Year	AWDT
1999	11,200
2000	11,700
2001	12,200

$$\text{Linear Growth Rate} = \{[(12,200-11,200)/2]/12,200\} \times 100 = 4.10\%$$

Projected AWDT	
1999	11,200
2000	11,700
2001	12,200
2002	12,700
2003	13,200
2004	13,700
2005	14,200

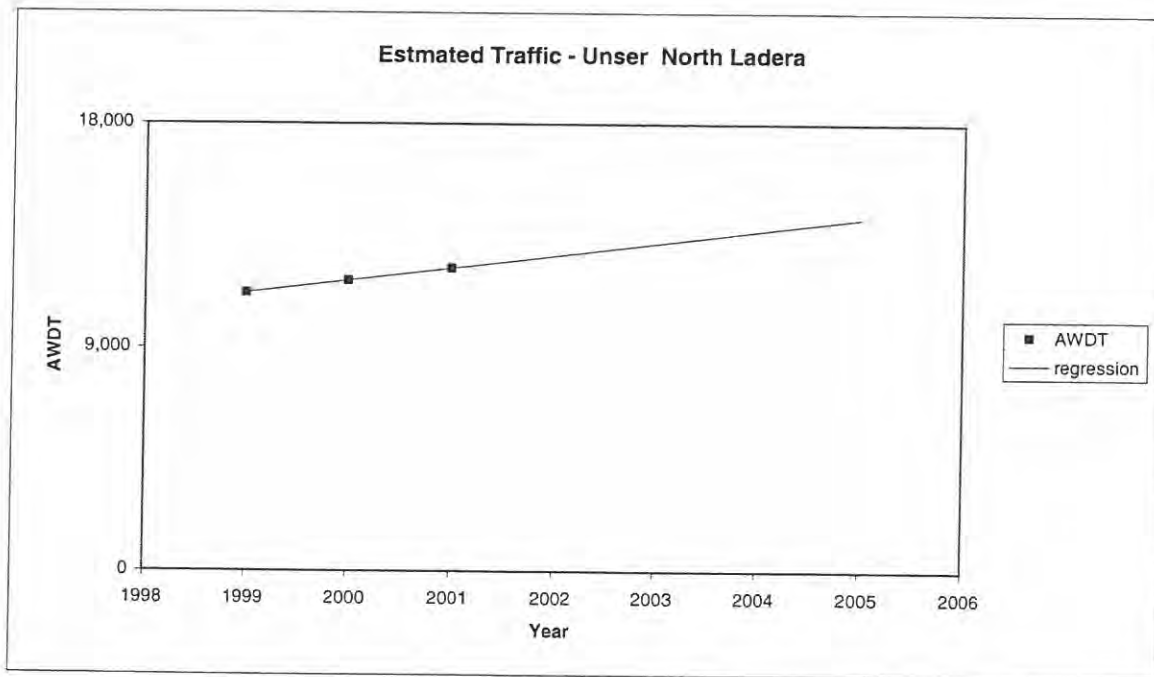
Regression Output	
R Square	1.00
Standard Error	1.44E-07
Observations	3
Intercept	-988,300
Std Err of Intercept	2.E-04
Coefficient	500.00
Std Err of Coefficient	0

Regression Equation
AWDT = 709 x Year - 1,376,076

Estimated Annual Growth Rate

$$[(14,200-12,200)/12,200] \times 100\% = 16.39\%$$

$$16.39\%/4 = 4.10\%$$



Westland Tract I Growth Rate Determination

AWDT on Unser
(South of Ladera)

Year	AWDT
1999	17,400
2000	18,100
2001	18,800

$$\text{Linear Growth Rate} = \frac{((18,800 - 17,400) / 2) / 18,800 \times 100}{1} = 3.72\%$$

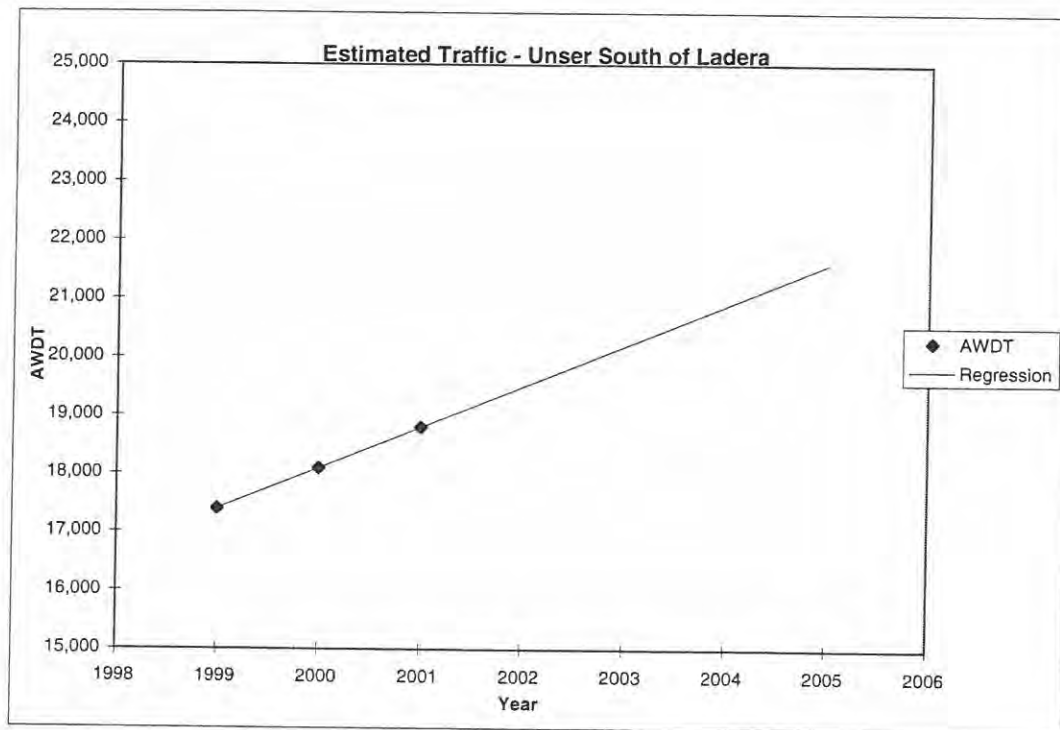
Projected AWDT

1999	17,400
2000	18,100
2001	18,800
2002	19,500
2003	20,200
2004	20,900
2005	21,600

Regression Output	
R Square	1.000
Standard Error	1.96E-07
Observations	3
Intercept	-1,381,900
Std Err of Intercept	2.77E-04
Coefficient	700
Std Err of Coefficient	1.38E-07

Regression Equation
AWDT = 700 x Year + -1,381,900

$$\begin{aligned} \text{Estimated Annual Growth Rate} \\ ((21,600 - 18,800) / 18,800) \times 100\% &= 14.89\% \\ 14.89\% / 4 &= 3.72\% \end{aligned}$$



Westland Tract I Growth Rate Determination

AWDT on Ladera
(East of Unser)

Year	AWDT
1999	8,400
2000	8,700
2001	9,100

$$\text{Linear Growth Rate} = \{[(9,100-8,400)/2]/9,100\} \times 100 = 3.85\%$$

Projected AWDT

1999	8,383
2000	8,733
2001	9,083
2002	9,433
2003	9,783
2004	10,133
2005	10,483

Regression Output

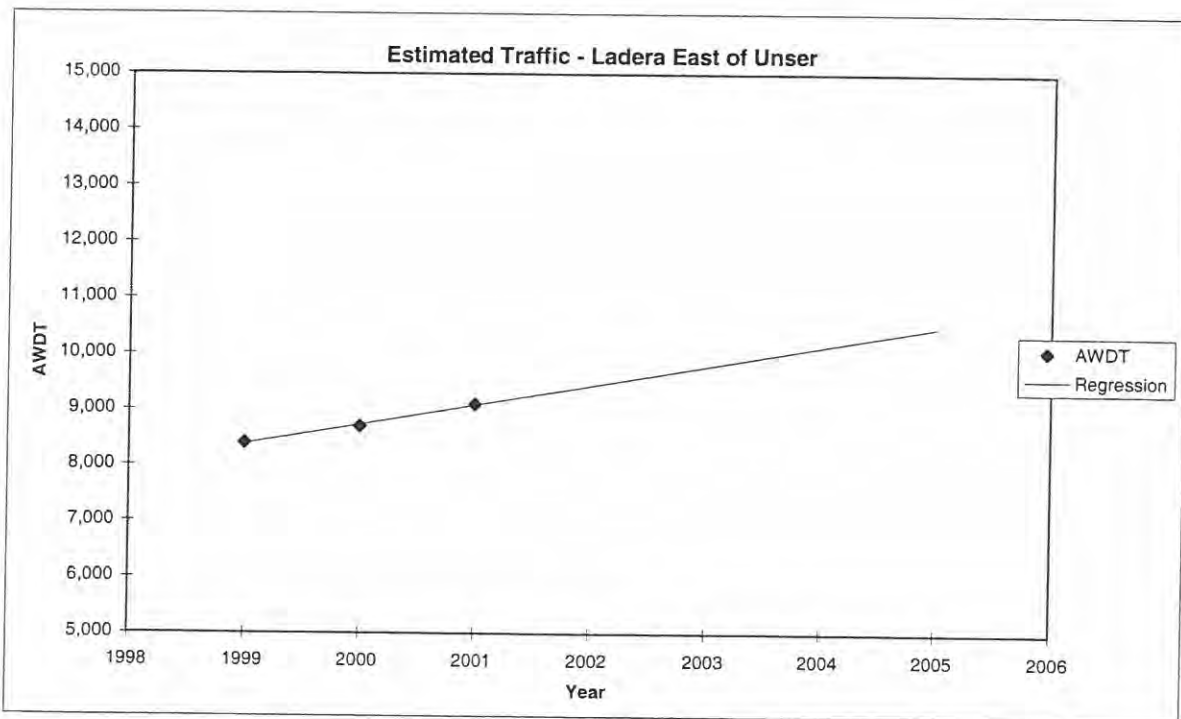
R Square	0.99
Standard Error	4.08E+01
Observations	3
Intercept	-691,267
Std Err of Intercept	57,735
Coefficient	350
Std Err of Coefficient	2.89E+01

Regression Equation
AWDT = 350 x Year - 691,267

Estimated Annual Growth Rate

$$[(10,483-9,100)/9,100] \times 100\% = 15.20\%$$

$$15.20\%/4 = 3.80\%$$



Westland Tract I Growth Rate Determination

AWDT on Unser
(South of I-40)

Year	AWDT
1999	13,600
2000	13,900
2001	14,300

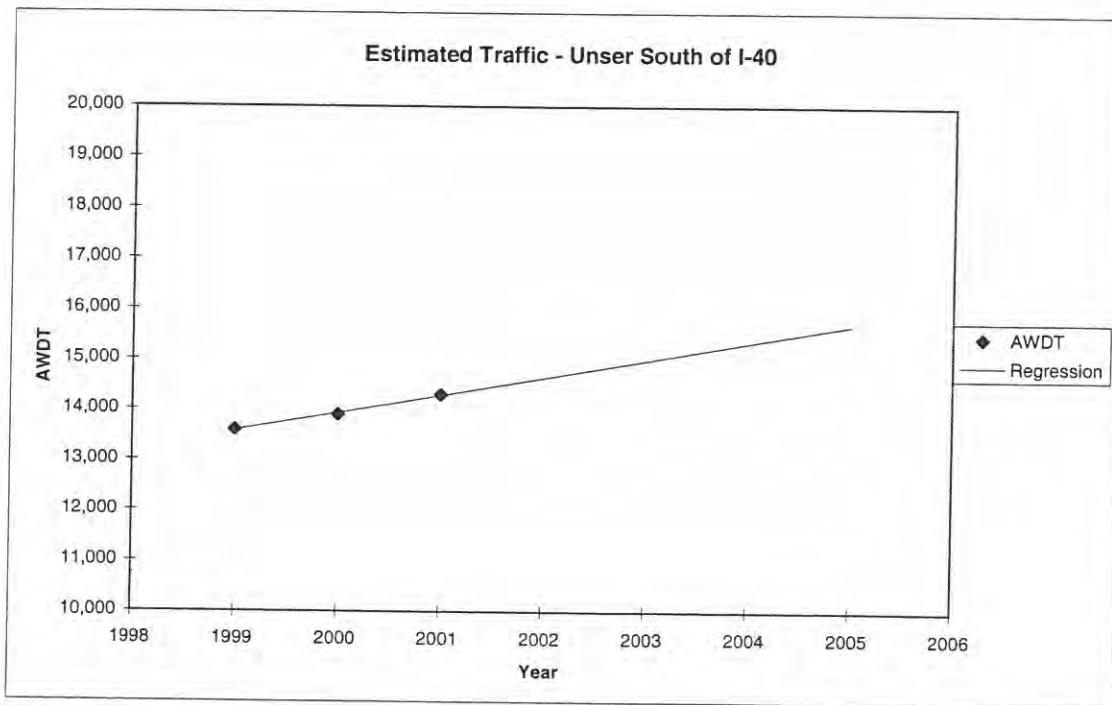
$$\text{Linear Growth Rate} = \{[(14,300-13,600)/2]/14,300\} \times 100 = 2.45\%$$

Projected AWDT	
1999	13,583
2000	13,933
2001	14,283
2002	14,633
2003	14,983
2004	15,333
2005	15,683

Regression Output	
R Square	0.993
Standard Error	4.08E+01
Observations	3
Intercept	-686,067
Std Err of Intercept	57,735
Coefficient	3.50E+02
Std Err of Coefficient	2.89E+01

Regression Equation
AWDT = 350 x Year - 686,067

$$\begin{aligned} \text{Estimated Annual Growth Rate} \\ & [(15,683-14,300)/14,300] \times 100\% = 9.67\% \\ & 9.67\%/4 = 2.42\% \end{aligned}$$



Westland Tract I Growth Rate Determination

AWDT on 98th st
(South of I-40)

Year	AWDT
1999	16,800
2000	17,100
2001	17,700

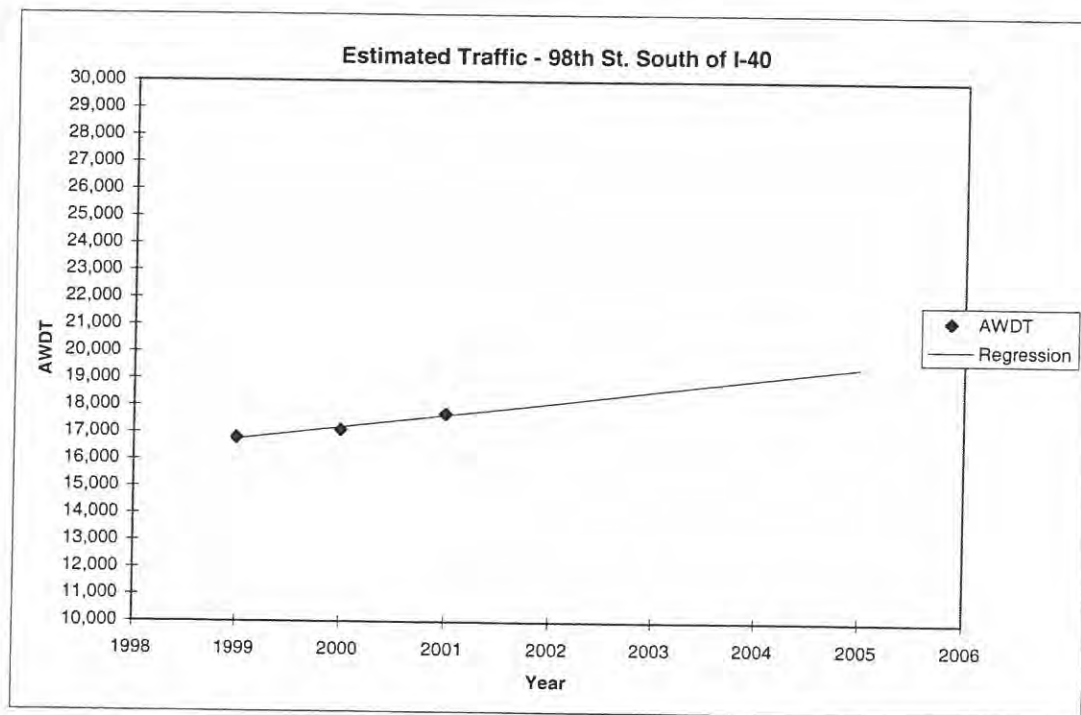
$$\text{Linear Growth Rate} = \{[(17,700-16,800)/2]/17,700\} \times 100 = 2.54\%$$

Projected AWDT	
1999	16,750
2000	17,200
2001	17,650
2002	18,100
2003	18,550
2004	19,000
2005	19,450

Regression Output	
R Square	0.964
Standard Error	122
Observations	3
Intercept	-882,800
Std Err of Intercept	173,205
Coefficient	450.0
Std Err of Coefficient	87

Regression Equation
AWDT = 450 x Year - 882,800

$$\begin{aligned} \text{Estimated Annual Growth Rate} \\ & [(19,450-17,700)/17,700] \times 100\% = 9.89\% \\ & 9.89\%/4 = 2.47\% \end{aligned}$$



APPENDIX E

2005 NO BUILD INTERSECTION CAPACITY ANALYSIS

TABLE 3 - 2005 NO-BUILD SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS						
Intersection	AM Peak			PM Peak		
	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	361.6	1.57	F	34.1	0.74	C*
Add 3 rd N/S Thru	258.3	1.33	F			
Plus 3 rd WB Left & 2 nd EB Right	125.7	1.05	F			
4 th N/S Thru with Above Turn Lanes	70.3	0.91	E**			
* - some movements LOS E						
** - some movements LOS F						

TABLE 4 - 2005 NO-BUILD UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Movement	AM Peak				PM Peak			
	Delay	v/c	Queue (veh)	LOS	Delay	v/c	Queue (veh)	LOS
98 th St. and I-40 WB Ramps								
WB Left	10.4	0.226	1	B	25.7	0.802	8	D
NB Left	7.3	0.029	<1	A	7.3	0.050	<1	A
98 th St. and I-40 EB Ramp								
EB Right	9.7	0.057	<1	A	15.1	0.170	1	C

WESTLAND TRACT I
NO BUILD 2005 CONDITIONS
Ladera & Unser, AM PEAK

08/04/03
15:50:06

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
Degree of Saturation (v/c) 1.57 Vehicle Delay 361.6 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
/ \ North 		* * + * * + <* * +> v		^ ++++ <++++
	^	^	^ *****	^
	<+ + +> **** + + + v + + +	<+ + +> + + + + + +	++++ v +> + + +	++++ ++++> **** v
	G/C=0.154 G= 18.5" Y+R= 4.0" OFF= 0.0%	G/C=0.453 G= 54.4" Y+R= 4.0" OFF=18.8%	G/C=0.132 G= 15.9" Y+R= 4.0" OFF=67.4%	G/C=0.127 G= 15.2" Y+R= 4.0" OFF=84.0%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
---------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach

451.4 F

RT+TH	24/2	0.856	0.453	1362	1603	3134	1.955	464.9	*F	6196 ft
LT	12/1	0.315	0.453	276	403	98	0.243	21.6	C+	103 ft

S Approach

12.8 B+

RT	12/1	0.374	0.806	1269	1277	360	0.282	3.5	A	161 ft
TH	24/2	0.304	0.641	2217	2268	480	0.212	9.2	A	173 ft
LT	12/1	0.175	0.154	180	322	199	0.594	38.6	D+	204 ft

E Approach

424.2 F

RT+TH	12/1	0.290	0.127	1	189	165	0.730	69.1	E	267 ft
LT	24/2	0.372	0.132	1	424	888	1.956	490.2	*F	1710 ft

W Approach

367.3 F

RT	12/1	0.630	0.314	208	496	923	1.853	432.9	*F	3252 ft
TH	12/1	0.280	0.127	1	199	144	0.610	60.8	E+	224 ft
LT	12/1	0.107	0.132	103	311	49	0.152	32.4	C	63 ft

WESTLAND TRACT I
 NO BUILD 2005 CONDITIONS - Add 3rd N/S Thru
 Ladera & Unser, AM PEAK

08/04/03
 15:57:48

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 1.33 Vehicle Delay 258.3 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
		* * + * * + <* * +> V		^ ++++ <++++
			^ ***** ++++ V	^ ++++
	<+ + +> ***** + + + V + + +	<+ + +> + + + + + +	+> + +	++++> ***** V
	G/C=0.183 G= 22.0" Y+R= 4.0" OFF= 0.0%	G/C=0.375 G= 45.0" Y+R= 4.0" OFF=21.7%	G/C=0.157 G= 18.9" Y+R= 4.0" OFF=62.5%	G/C=0.151 G= 18.1" Y+R= 4.0" OFF=81.6%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach

320.7 F

RT+TH	36/3	0.626	0.375	1407	1906	3134	1.644	329.8	*F	3968 ft
LT	12/1	0.318	0.375	171	318	98	0.300	28.7	C	117 ft

S Approach

12.6 B+

RT	12/1	0.374	0.782	1223	1239	360	0.291	4.3	A	176 ft
TH	36/3	0.280	0.592	2932	3009	480	0.160	11.2	B+	133 ft
LT	12/1	0.157	0.183	227	379	199	0.516	30.9	C	199 ft

E Approach

303.2 F

RT+TH	12/1	0.290	0.151	1	235	165	0.613	57.7	E+	250 ft
LT	24/2	0.372	0.157	1	518	888	1.644	348.8	*F	1519 ft

W Approach

264.3 F

RT	12/1	0.630	0.368	344	582	923	1.586	309.7	*F	2878 ft
TH	12/1	0.280	0.151	1	248	144	0.512	53.4	D	213 ft
LT	12/1	0.084	0.157	211	397	49	0.123	27.8	C	59 ft

WESTLAND TRACT I
 NO BUILD 2005 CONDITIONS - Add 3rd N/S Thru
 Ladera & Unser, AM PEAK - & 3rd WB L & 2nd WB R

08/04/03
 15:59:30

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 1.05 Vehicle Delay 125.7 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
/ \ North 	^ <+ + +> ***** v + + +	* * + * * + <* * +> v ^ <+ + +> + + + + + +	^ ***** v +> + +	^ +++++ <++++ ^ +++++ ***** v
	G/C=0.130 G= 15.6" Y+R= 4.0" OFF= 0.0%	G/C=0.492 G= 59.0" Y+R= 4.0" OFF=16.4%	G/C=0.137 G= 16.5" Y+R= 4.0" OFF=68.9%	G/C=0.107 G= 12.9" Y+R= 4.0" OFF=85.9%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used	Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
---------------	-----------------	------------------	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach

144.6 F

RT+TH	36/3	0.626	0.492	2292	2498	3134	1.255	148.5	*F	3102 ft
LT	12/1	0.318	0.492	316	429	98	0.228	18.7	B	97 ft

S Approach

13.6 B+

RT	12/1	0.374	0.826	1307	1308	360	0.275	2.9	A	148 ft
TH	36/3	0.280	0.655	3316	3332	480	0.144	8.0	A	116 ft
LT	12/1	0.185	0.130	151	276	199	0.682	46.4	D	224 ft

E Approach

163.8 F

RT+TH	12/1	0.290	0.107	1	152	165	0.864	89.9	F	295 ft
LT	36/3	0.318	0.137	1	691	888	1.254	177.6	*F	788 ft

W Approach

139.4 F

RT	24/2	0.424	0.271	189	755	923	1.223	155.6	*F	1446 ft
TH	12/1	0.280	0.107	1	161	144	0.720	71.8	E	238 ft
LT	12/1	0.126	0.137	74	292	49	0.161	33.8	C	64 ft

WESTLAND TRACT I
 NO BUILD 2005 CONDITIONS - Add 4th N/S Thru
 Ladera & Unser, AM PEAK - & 3rd WB L & 2nd WB R

08/04/03
 16:00:13

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 0.91 Vehicle Delay 70.3 Level of Service E

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
 North		* * + * * + <* * +> v		^ ++++ <++++
			^ ***** +++++ v	^ +++++
	<+ + +> **** + + + v + + +	<+ + +> + + + + + +	+> + +	++++> **** v
	G/C=0.152 G= 18.2" Y+R= 4.0" OFF= 0.0%	G/C=0.430 G= 51.6" Y+R= 4.0" OFF=18.5%	G/C=0.160 G= 19.2" Y+R= 4.0" OFF=64.8%	G/C=0.125 G= 15.0" Y+R= 4.0" OFF=84.2%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C Reqd Used		Service Rate @C (vph) @E	Adj Volume	v/c	HCM Delay	L S	Queue Model 1
------------	-----------------	------------------	--	-----------------------------	---------------	-----	--------------	--------	------------------

N Approach

74.3 E

RT+TH	48/4	0.494	0.430	2531	2911	3134	1.077	75.9	*E	1928 ft
LT	12/1	0.318	0.430	240	375	98	0.261	23.7	C+	108 ft

S Approach

12.9 B+

RT	12/1	0.374	0.808	1273	1280	360	0.281	3.4	A	160 ft
TH	48/4	0.268	0.615	4136	4169	480	0.115	9.6	A	95 ft
LT	12/1	0.169	0.152	183	319	199	0.601	38.2	D+	212 ft

E Approach

99.0 F

RT+TH	12/1	0.290	0.125	1	186	165	0.740	70.3	E	269 ft
LT	36/3	0.318	0.160	1	820	888	1.076	104.3	*F	655 ft

W Approach

85.3 F

RT	24/2	0.424	0.310	395	864	923	1.068	91.9	*F	1232 ft
TH	12/1	0.280	0.125	1	196	144	0.618	61.5	E+	225 ft
LT	12/1	0.109	0.160	162	363	49	0.133	29.9	C	61 ft

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser

Degree of Saturation (v/c) 0.74 Vehicle Delay 34.1 Level of Service C

Sq 62 **/**	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
/ \ North 	*		* * +	^	^
	*		* * +	++++	++++
	>		< * +>	<++++	<++++
		^	v	****	^
			^	v	++++
	<+	<* + +>	<+ + +>	+>	****>
	++++ +	++++ * + +	+ + +	+	++++
	v +	v * + +	+ + +	+	v
	G/C=0.049	G/C=0.253	G/C=0.284	G/C=0.131	G/C=0.116
	G= 5.9"	G= 30.4"	G= 34.1"	G= 15.7"	G= 13.9"
	Y+R= 4.0"	Y+R= 4.0"	Y+R= 4.0"	Y+R= 4.0"	Y+R= 4.0"
	OFF= 0.0%	OFF= 8.3%	OFF=36.9%	OFF=68.6%	OFF=85.1%

C=120 sec G=100.0 sec = 83.3% Y=20.0 sec = 16.7% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C		Service Rate		Adj	v/c	HCM Delay	L S	Queue Model 1
		Reqd	Used	@C (vph)	@E	Volume				

N Approach

49.3 D

RT+TH	24/2	0.363	0.284	341	998	853	0.855	49.9	*D	722 ft
LT	12/1	0.068	0.049	59	138	87	0.569	42.8	*D+	129 ft

S Approach

25.2 C+

RT	12/1	0.549	0.734	1130	1163	757	0.651	10.9	B+	600 ft
TH	24/2	0.502	0.570	1912	2019	1599	0.792	23.5	C+	1085 ft
LT	12/1	0.383	0.336	493	656	588	0.896	48.2	*D	833 ft

E Approach

52.8 D

RT+TH	12/1	0.308	0.280	133	483	216	0.441	38.3	D+	272 ft
LT	24/2	0.286	0.131	1	419	342	0.762	61.9	*E+	293 ft

W Approach

36.6 D+

RT	12/1	0.368	0.485	621	769	344	0.447	22.2	C+	341 ft
TH	12/1	0.280	0.116	1	178	142	0.657	65.4	*E+	227 ft
LT	12/1	0.263	0.116	1	99	47	0.348	55.8	E+	76 ft

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM NO-BUILD 2005
 Comment 2005 NO-BUILD CONDITIONS

Site Information

Jurisdiction/Date COA 8/5/2003
 Major Street 98TH ST.
 Minor Street I-40 WB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R			R					
Lane 2	T			T			L					
Lane 3	L			T			L					
	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)	42	0			0	0	353		0			
PHF	.9	.9			.9	.9	.9		.9			
Proportion of heavy vehicles, HV	3	3			3	3	3		3			
Flow rate	47	0			0	0	392		0			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	R	2	1079	.002	<1	8.3	A	10.3 B
	2	L	196	867	.226	1	10.4	B	
	3	L	196	867	.226	1	10.4	B	
EB	1								
	2								
	3								
		①	47	1613	.029	<1	7.3	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM NO-BUILD 2005
 Comment 2005 NO-BUILD CONDITIONS

Site Information

Jurisdiction/Date COA 8/5/2003
 Major Street 98TH ST.
 Minor Street I-40 WB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R			R					
Lane 2	T			T			L					
Lane 3	L			T			L					
	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)	72	0			0	0	1114		0			
PHF	.9	.9			.9	.9	.9		.9			
Proportion of heavy vehicles, HV	3	3			3	3	3		3			
Flow rate	80	0			0	0	1238		0			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	R	2	1079	.002	<1	8.3	A	25.6 D
	2	L	619	772	.802	8	25.7	D	
	3	L	619	772	.802	8	25.7	D	
EB	1								
	2								
	3								
		①	80	1613	.05	<1	7.3	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM NO-BUILD 2005
 Comment NO-BUILD CONDITIONS, 2005

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street 98TH ST.
 Minor Street I-40 EB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	R			R						R		
Lane 2	T			T						T		
Lane 3	T			T						L		
	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)		42	1061		353	0				0	0	41
PHF		.9	.9		.9	.9				.9	.9	.9
Proportion of heavy vehicles, HV		3	3		3	3				3	3	3
Flow rate		47	1179		392	0				0	0	46
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	46	809	.057	<1	9.7	A	9.7
	2	T				<1			
	3	L				<1			
		①							
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	<u>AY</u>	Jurisdiction/Date	<u>COA</u> <u>7/21/2003</u>
Agency or Company	<u>BHI</u>	Major Street	<u>98TH ST.</u>
Analysis Period/Year	<u>PM NO-BUILD</u> <u>2005</u>	Minor Street	<u>I-40 EB RAMPS</u>
Comment	<u>NO-BUILD CONDITIONS, 2005</u>		

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	R			R						R		
Lane 2	T			T						T		
Lane 3	T			T						L		
	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)		72	473		1114	0				0	0	66
PHF		.9	.9		.9	.9				.9	.9	.9
Proportion of heavy vehicles, HV		3	3		3	3				3	3	3
Flow rate		80	526		1238	0				0	0	73
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	73	429	.17	1	15.1	C	15.1 C
	2	T				<1			
	3	L				<1			
		①							
		④							

APPENDIX F

TRIP DISTRIBUTION/TRIP ASSIGNMENT

WESTLAND Tract 1 RESIDENTIAL TRIP DISTRIBUTION
EMPLOYMENT BY SUBAREA

SUBAREA	(Se) 2005	DISTANCE (D)	EMP./DIST. (Se/D)	%	I-40 West		I-40 East	
					% Utilizing	% Employment/ Dist. Utilizing	% Utilizing	% Employment/ Dist. Utilizing
	2005	(D)	(Se/D)	2005		EMP/Dist		EMP/Dist
1	4,763	17.25	276	0.53%	50%	138	0.00%	0
2	22,575	10.50	2,150	4.14%		0	0.00%	0
3	1,222	12.50	98	0.19%		0	0.00%	0
4	2,694	19.75	136	0.26%		0	100%	136
5	12,928	8.25	1,567	3.02%		0	0.00%	0
6	147	6.50	23	0.04%	50%	11	0.00%	0
7	10,257	2.75	3,730	7.18%	4%	141	0.02%	258
8	8,137	2.50	3,255	6.26%		0	0.50%	0
9	69	13.50	5	0.01%	100%	5	0.00%	0
10	2,680	5.50	487	0.94%		0	0.00%	0
11	5,776	6.25	924	1.78%		0	0.00%	0
12	6,833	8.50	804	1.55%		0	100%	924
13	45,105	10.00	4,511	8.68%		0	0.00%	0
14	36,361	13.50	2,693	5.18%		0	4.34%	2,255
15	19,266	5.50	3,503	6.74%		0	100%	2,693
16	78,155	12.25	6,380	12.28%		0	50%	1,751
17	39,496	5.00	7,899	15.20%		0	100%	6,380
18	49,531	7.50	6,604	12.71%		0	7.60%	3,950
19	31,549	11.25	2,804	5.40%		0	100%	6,604
20	7,979	7.75	1,030	1.98%		0	100%	2,804
21	29	11.00	3	0.01%		0	0.00%	0
22	23,679	14.75	1,605	3.09%		0	100%	3
23	2,308	19.50	118	0.23%		0	100%	1,605
24	2,351	12.25	192	0.37%		0	100%	118
25	128	17.75	7	0.01%		0	100%	192
26	19,073	22.00	867	1.67%		0	0.01%	7
27	3,291	18.75	176	0.34%		0	100%	867
28	3,344	26.50	126	0.24%		0	0.00%	0
TOTALS =	439,726		51,973	100.00%		0	59.02%	126

2005 EMPLOYMENT FROM 2020 SOCIOECONOMIC CHARACTERISTICS (TR-125) - APPENDIX B

WESTLAND Tract 1 RESIDENTIAL TRIP DISTRIBUTION
EMPLOYMENT BY SUBAREA

SUBAREA	(Se) 2005	DISTANCE (D)	EMP./DIST. (Se/D)	2005	%	98th South		Ladera East	
						% Utilizing	% Employment/ Dist. Utilizing	% Utilizing	% Employment/ Dist. Utilizing
							EMP/Dist		EMP/Dist
1	4,763	17.25	276	0.53%			0	25%	0.13%
2	22,575	10.50	2,150	4.14%			0	50%	2.07%
3	1,222	12.50	98	0.19%			0	50%	0.09%
4	2,694	19.75	136	0.26%			0		0.00%
5	12,928	8.25	1,567	3.02%			0	50%	1.51%
6	147	6.50	23	0.04%			0		0.00%
7	10,257	2.75	3,730	7.18%		0%	0	63%	4.52%
8	8,137	2.50	3,255	6.26%			0		0.00%
9	69	13.50	5	0.01%			0		0.00%
10	2,680	5.50	487	0.94%		100%	487		0.00%
11	5,776	6.25	924	1.78%			0		0.00%
12	6,833	8.50	804	1.55%			0		0.00%
13	45,105	10.00	4,511	8.68%			0	50%	0.77%
14	36,361	13.50	2,693	5.18%			0	25%	2.17%
15	19,266	5.50	3,503	6.74%			0		0.00%
16	78,155	12.25	6,380	12.28%			0	25%	1.68%
17	39,496	5.00	7,899	15.20%		50%	0		0.00%
18	49,531	7.50	6,604	12.71%			3,950		0.00%
19	31,549	11.25	2,804	5.40%			0		0.00%
20	7,979	7.75	1,030	1.98%		50%	515		0.00%
21	29	11.00	3	0.01%			0		0.00%
22	23,679	14.75	1,605	3.09%			0		0.00%
23	2,308	19.50	118	0.23%			0		0.00%
24	2,351	12.25	192	0.37%			0		0.00%
25	128	17.75	7	0.01%			0		0.00%
26	19,073	22.00	867	1.67%			0		0.00%
27	3,291	18.75	176	0.34%			0	50%	0.00%
28	3,344	26.50	126	0.24%			0		0.00%
TOTALS =	439,726		51,973	100.00%			9.53%		13.12%

2005 EMPLOYMENT FROM 2020 SOCIOECONOMIC CHARACTERISTICS (TR-125) - A

WESTLAND Tract I - RESIDENTIAL TRIP DISTRIBUTION - (SUBAREA 7)
EMPLOYMENT BY DASZ

SUBZONES WITHIN SUBAREA 7	2005 EMPLOYMENT	Distance (miles)	2005 EMP/DIST (A)	2005 % (E-A/B) (E * 7.18 %)	I-40 West		I-40 East	
					% Utilizing	EMP/DIST	% Utilizing	EMP/DIST
6201	5	0.83	6.0	0.23%	0.00%	0	0.00%	0
6202	89	2.00	44.5	1.67%	0.00%	0	0.00%	0
6203	11	2.01	5.5	0.21%	0.00%	0	0.00%	0
6204	34	1.67	20.4	0.76%	0.00%	0	50%	17
6205	46	1.00	46.0	1.72%	0.00%	0	0.00%	0
6206	0	0.34	0.0	0.00%	0.00%	0	0.00%	0
6211	99	4.52	21.9	0.82%	0.00%	0	0.00%	0
6212	163	3.35	48.7	1.82%	0.00%	0	0.00%	0
6213	1,122	3.85	291.4	10.93%	0.00%	0	0.00%	0
6214	184	2.51	73.3	2.75%	0.00%	0	0.00%	0
6215	386	3.16	122.2	4.58%	0.00%	0	0.00%	0
6216	859	3.52	244.0	9.15%	0.00%	0	0.00%	0
6217	109	3.00	36.3	1.36%	0.00%	0	0.00%	0
6218	1,682	3.35	502.1	18.82%	0.00%	0	0.00%	0
6221	110	7.20	15.3	0.57%	0.00%	0	0.00%	0
6222	31	6.53	4.7	0.18%	0.00%	0	0.00%	0
6223	48	7.04	6.8	0.26%	0.00%	0	0.00%	0
6224	226	5.86	38.6	1.45%	0.00%	0	0.00%	0
6225	897	5.53	162.2	6.08%	0.00%	0	0.00%	0
6226	339	5.86	57.8	2.17%	0.00%	0	0.00%	0
6227	11	5.19	2.1	0.08%	0.00%	0	0.00%	0
6231	500	6.20	80.6	3.02%	0.00%	0	0.00%	0
6232	428	7.71	55.5	2.08%	0.00%	0	0.00%	0
6241	23	4.36	5.3	0.20%	0.00%	0	0.00%	0
6242	42	4.80	8.8	0.33%	0.00%	0	0.00%	0
6243	129	5.00	25.8	0.97%	0.00%	0	0.00%	0
6244	62	5.33	11.6	0.44%	0.00%	0	0.00%	0
6251	641	3.67	174.7	6.55%	0.00%	0	100%	641
6252	744	4.33	171.8	6.44%	0.00%	0	0.00%	0
6253	215	5.00	43.0	1.61%	0.00%	0	0.00%	0
6301	1,008	3.00	336.0	12.60%	30%	302	0.00%	0
6302	14	3.33	4.2	0.16%	0.00%	0	0.00%	0
TOTALS			2,667	100.00%	0.27%		0.50%	
			(B)					

2005 EMPLOYMENT FROM 2020 SOCIOECONOMIC FORECASTS (TR-125) - APPENDIX D

WESTLAND Tract I - RESIDENTIAL TRIP DISTRIBUTION - (SUBAREA 7)
EMPLOYMENT BY DASZ

SUBZONES WITHIN SUBAREA 7	2005 EMPLOYMENT	Distance (miles)	2005 EMP/DIST (A)	2005 % (E=A/B)	(E * 7.18 %)	9th South		Ladera East	
						% Utilizing	% Employment/ Dist. Utilizing	% Utilizing	% Employment/ Dist. Utilizing
						EMP/DIST	EMP/DIST	EMP/DIST	EMP/DIST
6201	5	0.83	6.0	0.23%	0.02%	0	0	100%	0.02%
6202	89	2.00	44.5	1.67%	0.12%	0	0	100%	0.12%
6203	11	2.01	5.5	0.21%	0.01%	0	0	100%	0.01%
6204	34	1.67	20.4	0.76%	0.05%	0	0	50%	0.03%
6205	46	1.00	46.0	1.72%	0.12%	0	0	100%	0.12%
6206	0	0.34	0.0	0.00%	0.00%	0	0	67%	0.00%
6211	99	4.52	21.9	0.82%	0.06%	0	0	0.00%	0.00%
6212	163	3.35	48.7	1.82%	0.13%	0	0	0.00%	0.00%
6213	1,122	3.85	291.4	10.93%	0.78%	0	0	100%	0.78%
6214	184	2.51	73.3	2.75%	0.20%	0	0	100%	0.20%
6215	386	3.16	122.2	4.58%	0.33%	0	0	100%	0.33%
6216	859	3.52	244.0	9.15%	0.66%	0	0	100%	0.66%
6217	109	3.00	36.3	1.36%	0.10%	0	0	50%	0.05%
6218	1,682	3.35	502.1	18.82%	1.35%	0	0	100%	1.35%
6221	110	7.20	15.3	0.57%	0.04%	0	0	50%	0.02%
6222	31	6.53	4.7	0.18%	0.01%	0	0	0.00%	0.00%
6223	48	7.04	6.8	0.26%	0.02%	0	0	0.00%	0.00%
6224	226	5.86	38.6	1.45%	0.10%	0	0	50%	0.05%
6225	897	5.53	162.2	6.08%	0.44%	0	0	0.00%	0.00%
6226	339	5.86	57.8	2.17%	0.16%	0	0	0.00%	0.00%
6227	11	5.19	2.1	0.08%	0.01%	0	0	0.00%	0.00%
6231	500	6.20	80.6	3.02%	0.22%	0	0	0.00%	0.00%
6232	428	7.71	55.5	2.08%	0.15%	0	0	50%	0.11%
6241	23	4.36	5.3	0.20%	0.01%	0	0	50%	0.07%
6242	42	4.80	8.8	0.33%	0.02%	0	0	0.00%	0.00%
6243	129	5.00	25.8	0.97%	0.07%	0	0	0.00%	0.00%
6244	62	5.33	11.6	0.44%	0.03%	0	0	50%	0.02%
6251	641	3.67	174.7	6.55%	0.47%	0	0	0.00%	0.00%
6252	744	4.33	171.8	6.44%	0.46%	0	0	100%	0.46%
6253	215	5.00	43.0	1.61%	0.12%	0	0	100%	0.12%
6301	1,008	3.00	336.0	12.60%	0.90%	0	0	0.00%	0.00%
6302	14	3.33	4.2	0.16%	0.01%	0	0	0.00%	0.00%
TOTALS			2,667	100.00%	7.18%				4.52%

(B)

2005 EMPLOYMENT FROM 2020 SOCIOECONOMIC FORECASTS (TR-125) - APPENDIX D

APPENDIX G

2005 TURNING MOVEMENT TABULATION

Westland Tract I
Turning Movement Tabulation

INTERSECTION: Ladera and Unser
(existing traffic signal)

AM Peak Hour

	Southbound Unser			Westbound Ladera			Northbound Unser			Eastbound Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing* (2002)	75	2,262	14	668	88	36	87	310	262	36	104	496
Background Growth** (2002-2003)	3	93	1	25	3	1	3	11	10	1	4	20
2003 Volumes	78	2,355	15	693	91	37	90	321	272	37	108	516
Background Growth** (2003-2005)	6	193	1	53	7	3	7	24	20	3	9	41
Approved Future Developments:												
Westridge		110						37				
Painted Sky							30					88
Parkway							7					22
Tierra Oeste							3					9
Clelo Oeste							14					42
Crossings		21					10	7				30
2005 No Build	84	2,679	16	746	98	40	161	389	292	40	117	748
New Network: Ladera extended to 98th												
Enter			10		12		7					
Exit										29	37	20
Diversions							-37					-110
2005 Build	84	2,679	25	746	111	40	131	389	292	69	154	658
PHF	0.860			0.840			0.810			0.810		

PM Peak Hour

	Southbound Unser			Westbound Ladera			Northbound Unser			Eastbound Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing* (2002)	67	549	29	257	97	65	229	1,029	550	34	102	139
Background Growth** (2002-2003)	3	23	1	10	4	2	8	38	20	1	4	6
2003 Volumes	70	572	30	267	101	67	237	1,067	570	35	106	145
Background Growth** (2003-2005)	6	47	2	20	8	5	18	79	42	3	8	12
Approved Future Developments:												
Westridge		70						125				
Painted Sky							102					57
Parkway							25					14
Tierra Oeste							10					6
Clelo Oeste							49					27
Crossings		13					35	24				19
2005 No Build	75	701	33	287	108	73	476	1,295	613	38	115	279
New Network: Ladera extended to 98th												
Enter			33		43		24					
Exit										18	24	13
Diversions							-127					-71
2005 Build	75	701	66	287	151	73	373	1,295	613	57	138	221
PHF	0.810			0.950			0.930			0.74		

*: 2002 Volumes from Middle Rio Grande COG 11/12/02

** : Growth rates 7% on the WB approach, and 4% on all the other approaches

growth rates	4.1%	4.1%	4.1%	3.8%	3.8%	3.8%	3.7%	3.7%	3.7%	4.0%	4.0%	4.0%
Residential Trip Distribution % Enter			10.19%		13.12%		7.25%					
Residential Trip Distribution % Exit										10.19%	13.12%	7.25%

Westland Tract I
Turning Movement Tabulation

INTERSECTION: 98th and I-40 WB Ramp
(existing un-signalized intersection)

AM Peak Hour

	Southbound 98th St.			Westbound I-40			Northbound 98th St.			Eastbound I-40		
				Off-Ramp			On-Ramp			On-Ramp		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing* (2003)		0	0	328		0	40	0				
2003 Volumes		0	0	328		0	40	0				
Background Growth** (2003-2005)		0	0	25		0	2	0				
Approved Future Developments:												
Westridge												
Painted Sky												
Parkway												
Tierra Oeste												
Cielo Oeste												
Crossings												
2005 No Build		0	0	353		0	42	0				
New Network: Ladera extended to 98th												
Enter						56		10				
Exit		192	3									
Diversions		110				37						
2005 Build		302	3	353		93	42	10				
PHF				0.770			0.840			0.730		

PM Peak Hour

	Southbound 98th St.			Westbound I-40			Northbound 98th St.			Eastbound I-40		
				Off-Ramp			On-Ramp			On-Ramp		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing* (2003)		0	0	1,035		0	69	0				
2003 Volumes		0	0	1,035		0	69	0				
Background Growth** (2003-2005)		0	0	79		0	3	0				
Approved Future Developments:												
Westridge												
Painted Sky												
Parkway												
Tierra Oeste												
Cielo Oeste												
Crossings												
2005 No Build		0	0	1,114		0	72	0				
New Network: Ladera extended to 98th												
Enter						192		34				
Exit		123	2									
Diversions		71				127						
2005 Build		194	2	1,114		319	72	34				
PHF				0.860			0.930			0.9		

*: 2003 Volumes taken in May 2003

**: 3% growth rate

growth rates	3.0%	3.0%	3.0%	3.8%	3.8%	3.8%	2.5%	2.5%	2.5%	4.0%	4.0%	4.0%
Residential Trip Distribution % Enter						59.02%		10.43%				
Residential Trip Distribution % Exit		68.55%	0.90%									

Westland Tract I
Turning Movement Tabulation

INTERSECTION: Ladera and Dr.Wy. #1
(Proposed Intersection, un-signalized)

AM Peak Hour

	Southbound N. Dr.Wy.			Westbound Ladera			Northbound S. Dr.Wy.			Eastbound Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2003)												
2003 Volumes	0	0	0	0	0	0	0	0	0	0	0	0
Background Growth** (2003-2005)	0	0	0	0	0	0	0	0	0	0	0	0
Approved Future Developments:												
Westridge												
Painted Sky												
Parkway												
Tierra Oeste												
Cielo Oeste												
Crossings												
2005 No Build	0	0	0	0	0	0	0	0	0	0	0	0
New Network: Ladera extended to 98th												
Enter				12							40	26
Exit					117		78		34			
Diversions					110						37	
2005 Build	0	0	0	12	227	0	78	0	34	0	77	26
PHF												

PM Peak Hour

	Southbound N. Dr.Wy.			Westbound Ladera			Northbound S. Dr.Wy.			Eastbound Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2003)												
2003 Volumes	0	0	0	0	0	0	0	0	0	0	0	0
Background Growth** (2003-2005)	0	0	0	0	0	0	0	0	0	0	0	0
Approved Future Developments:												
Westridge												
Painted Sky												
Parkway												
Tierra Oeste												
Cielo Oeste												
Crossings												
2005 No Build	0	0	0	0	0	0	0	0	0	0	0	0
New Network: Ladera extended to 98th												
Enter				40							135	90
Exit					75		50		22			
Diversions					71						127	
2005 Build	0	0	0	40	146	0	50	0	22	0	262	90
PHF												

growth rates	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Residential Trip Distribution % Enter				12.24%							41.67%	27.78%
Residential Trip Distribution % Exit					41.67%		27.78%		12.24%			

Westland Tract I
Turning Movement Tabulation

INTERSECTION: Ladera and Dr.Wy. #3
(Proposed Intersection, un-signalized)

AM Peak Hour

	Southbound Dr.Wy.			Westbound Ladera			Northbound			Eastbound Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2003)												
2003 Volumes	0	0	0	0	0	0	0	0	0	0	0	0
Background Growth** (2003-2005)	0	0	0	0	0	0	0	0	0	0	0	0
Approved Future Developments:												
Westridge												
Painted Sky												
Parkway												
Tierra Oeste												
Clelo Oeste												
Crossings												
2005 No Build	0	0	0	0	0	0	0	0	0	0	0	0
New Network: Ladera extended to 98th												
Enter					17	12				20		
Exit	34		58								51	
Diversions					110						37	
2005 Build	34	0	58	0	127	12	0	0	0	20	88	0
PHF												

PM Peak Hour

	Southbound Dr.Wy.			Westbound Ladera			Northbound			Eastbound Ladera		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2003)												
2003 Volumes	0	0	0	0	0	0	0	0	0	0	0	0
Background Growth** (2003-2005)	0	0	0	0	0	0	0	0	0	0	0	0
Approved Future Developments:												
Westridge												
Painted Sky												
Parkway												
Tierra Oeste												
Clelo Oeste												
Crossings												
2005 No Build	0	0	0	0	0	0	0	0	0	0	0	0
New Network: Ladera extended to 98th												
Enter					59	40				68		
Exit	22		38								33	
Diversions					71						127	
2005 Build	22	0	38	0	130	40	0	0	0	68	160	0
PHF												

growth rates	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Residential Trip Distribution % Enter					18.27%	12.29%				20.84%		
Residential Trip Distribution % Exit	12.29%		20.84%								18.27%	

APPENDIX H

2005 BUILD INTERSECTION CAPACITY ANALYSIS

TABLE 5 - 2005 BUILD SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS

	AM Peak			PM Peak		
Intersection	Delay	V/C	LOS	Delay	V/C	LOS
Unser and Ladera	331.4	1.51	F	37.5	0.76	D
Add 3 rd N/S T, 3 rd WB L, 2 nd EB R	111.2	1.02	F			
Add 4 th N/S T, 3 rd WB L, 2 nd EB R	61.9	0.88	E			
* - some movements LOS E						
** - some movements LOS F						

TABLE 6 – 2005 BUILD UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS[illegible]

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser

Degree of Saturation (v/c) 1.51 Vehicle Delay 331.4 Level of Service F

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
 North		* * + * * + <* * +> V		^ ++++ <++++
			^ ***** +++++ V	^ +++++
	<+ + +> ***** + + + V + + +	<+ + +> + + + + + +	+> + +	++++> ***** V
	G/C=0.121 G= 14.5" Y+R= 4.0" OFF= 0.0%	G/C=0.474 G= 56.8" Y+R= 4.0" OFF=15.4%	G/C=0.138 G= 16.5" Y+R= 4.0" OFF=66.1%	G/C=0.135 G= 16.1" Y+R= 4.0" OFF=83.2%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C		Service Rate		Adj	v/c	HCM Delay	L S	Queue Model 1
		Reqd	Used	@C (vph)	@E	Volume				

N Approach

416.7 F

RT+TH	24/2	0.859	0.474	1463	1674	3144	1.878	429.0	*F	6065 ft
LT	12/1	0.315	0.474	302	422	98	0.232	20.0	B	100 ft

S Approach

12.3 B+

RT	12/1	0.374	0.799	1255	1265	360	0.285	3.7	A	166 ft
TH	24/2	0.304	0.628	2162	2222	480	0.216	9.8	A	178 ft
LT	12/1	0.140	0.121	148	260	162	0.587	38.8	D+	173 ft

E Approach

389.5 F

RT+TH	12/1	0.294	0.135	1	205	180	0.747	68.9	E	290 ft
LT	24/2	0.372	0.138	1	445	888	1.877	454.5	*F	1667 ft

W Approach

314.2 F

RT	12/1	0.576	0.289	140	449	812	1.777	401.0	*F	2779 ft
TH	12/1	0.294	0.135	1	215	190	0.757	69.1	E	306 ft
LT	12/1	0.120	0.138	125	321	85	0.258	32.9	C	108 ft

WESTLAND TRACT I
 BUILD 2005 CONDITIONS - Add 4th N/S Thru
 Ladera & Unser, AM PEAK - & 3rd WB L & 2nd EB R

08/04/03
 16:02:56

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages for Int # 1 - Ladera & Unser
 Degree of Saturation (v/c) 0.88 Vehicle Delay 61.9 Level of Service E+

Sq 34 **/**	Phase 1	Phase 2	Phase 3	Phase 4
		* * + * * + <* * +> V		^ ++++ <++++
			^ ***** ++++ V	^ ++++
	<+ + +> **** + + + V + + +	<+ + +> + + + + + +	+> + +	++++> **** V
	G/C=0.089 G= 10.7" Y+R= 4.0" OFF= 0.0%	G/C=0.435 G= 52.2" Y+R= 4.0" OFF=12.2%	G/C=0.175 G= 21.0" Y+R= 4.0" OFF=59.1%	G/C=0.167 G= 20.1" Y+R= 4.0" OFF=79.9%

C=120 sec G=104.0 sec = 86.7% Y=16.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/Lanes	g/C Req'd	g/C Used	Service Rate @C (vph)	Adj @E Volume	v/c	HCM Delay	L S	Queue Model 1
------------	-------------	-----------	----------	-----------------------	---------------	-----	-----------	-----	---------------

N Approach

70.7 E

RT+TH	48/4	0.496	0.435	2580	2944	3144	1.068	72.2	*E	1912 ft
LT	12/1	0.318	0.435	246	379	98	0.259	23.2	C+	107 ft

S Approach

15.9 B

RT	12/1	0.374	0.766	1191	1213	360	0.297	4.9	A	186 ft
TH	48/4	0.268	0.557	3670	3778	480	0.127	12.7	B+	107 ft
LT	12/1	0.130	0.089	125	204	162	0.736	49.9	D	221 ft

E Approach

72.0 E

RT+TH	12/1	0.294	0.167	1	268	180	0.602	54.9	D	266 ft
LT	36/3	0.318	0.175	1	903	888	0.983	75.5	*E	587 ft

W Approach

68.0 E

RT	24/2	0.398	0.290	290	808	812	1.005	75.5	*E	1004 ft
TH	12/1	0.294	0.167	1	282	190	0.609	54.9	D	279 ft
LT	12/1	0.089	0.175	277	440	85	0.193	26.1	C+	97 ft

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM PEAK BUILD 2005
 Comment 2005 BUILD CONDITIONS

Site Information

Jurisdiction/Date COA 8/5/2003
 Major Street 98TH ST.
 Minor Street I-40 WB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R			R					
Lane 2	T			T			L					
Lane 3	L			T			L					
	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)	42	10			302	3	353		93			
PHF	.9	.9			.9	.9	.9		.9			
Proportion of heavy vehicles, HV	3	3			3	3	3		3			
Flow rate	47	11			336	3	392		103			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) _____ .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	R	103	1072	.096	<1	8.7	A	11.8 B
	2	L	196	665	.295	1	12.7	B	
	3	L	196	665	.295	1	12.7	B	
EB	1								
	2								
	3								
		①	47	1210	.039	<1	8.1	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM PEAK BUILD 2005
 Comment 2005 BUILD CONDITIONS

Site Information

Jurisdiction/Date COA 8/5/2003
 Major Street 98TH ST.
 Minor Street I-40 WB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	T			R			R					
Lane 2	T			T			L					
Lane 3	L			T			L					
	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)	72	34			194	2	1114		319			
PHF	.9	.9			.9	.9	.9		.9			
Proportion of heavy vehicles, HV	3	3			3	3	3		3			
Flow rate	80	38			216	2	1238		354			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

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	R	354	1051	.337	1	10.2	B	50.1 F
	2	L	619	620	.998	15	61.5	F	
	3	L	619	620	.998	15	61.5	F	
EB	1								
	2								
	3								
		①	80	1342	.06	<1	7.9	A	
		④							

CHAPTER 17 - AWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information			Site Information		
Analyst	EJW		Jurisdiction/Date	COA/NMDOT	8/5/2003
Agency or Company	COA		EB-WB Street	I-40 WB OFF RAMP	
Analysis Period/Year	AM BUILD	2005	NB-SB Street	98TH STREET	
Comment					

Input Data

		EB		WB		NB		SB	
		Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Lane code (Lane 1 is curb lane)				L	L	T	L	T	T
Volume (veh/h)	Left-turn			175	178		42		
	Through					10		275	27
	Right-turn								
Peak-hour factor				.9	.9	.9	.9	.9	.9
% Heavy vehicles				3	3	3	3	3	3

Outputs

	EB		WB		NB		SB	
	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Total lane flow rate (veh/h)			194	198	11	47	306	30
Departure headway, h_d (s)			6.16	6.16	6.19	6.7	5.82	5.82
Degree of utilization, x			.333	.338	.019	.087	.494	.048
Move-up time, m (s)			2.3	2.3	2.3	2.3	2.3	2.3
Service time, t_s (s)			3.86	3.86	3.89	4.4	3.52	3.52
Capacity (veh/h)			567	567	549	510	603	597
Delay (s) (Equation 17-55)			11.9	12	9	10	14.1	8.8
Level of service (Exhibit 17-22)			B	B	A	A	B	A
Delay (s), approach			11.9		9.8		13.6	
Level of service, approach			B		A		B	
Delay (s), intersection	12.5							
Level of service, intersection	B							

CHAPTER 17 - AWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information			Site Information		
Analyst	EJW		Jurisdiction/Date	COA/NMDOT	8/5/2003
Agency or Company	COA		EB-WB Street	I-40 WB OFF RAMP	
Analysis Period/Year	PM BUILD	2005	NB-SB Street	98TH STREET	
Comment					

Input Data

		EB		WB		NB		SB	
		Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Lane code (Lane 1 is curb lane)				L	L	T	L	T	T
Volume (veh/h)	Left-turn			557	557		72		
	Through					34		177	17
	Right-turn								
Peak-hour factor				.9	.9	.9	.9	.9	.9
% Heavy vehicles				3	3	3	3	3	3

Outputs

	EB		WB		NB		SB	
	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Total lane flow rate (veh/h)			619	619	38	80	197	19
Departure headway, h_d (s)			6.22	6.22	7.51	8.02	7.39	7.39
Degree of utilization, x			1.07	1.07	.079	.178	.404	.039
Move-up time, m (s)			2.3	2.3	2.3	2.3	2.3	2.3
Service time, t_s (s)			3.92	3.92	5.21	5.72	5.09	5.09
Capacity (veh/h)			580	580	480	450	488	487
Delay (s) (Equation 17-55)			81.5	81.5	10.9	12.5	15	10.4
Level of service (Exhibit 17-22)			F	F	B	B	B	B
Delay (s), approach			81.5		11.9		14.6	
Level of service, approach			F		B		B	
Delay (s), intersection	67.1							
Level of service, intersection	F							

August 5, 2003

98th & I-40 WB Off Ramp

WB Left

Variable input

Adjusted Tot vehicle turns (veh/hr)	557
Cycle Red time (seconds)	81.5
% of time capacity exceeded	5.00%
Avg vehicle length (feet)	20.00

Westland Tract I

Build

PM Peak

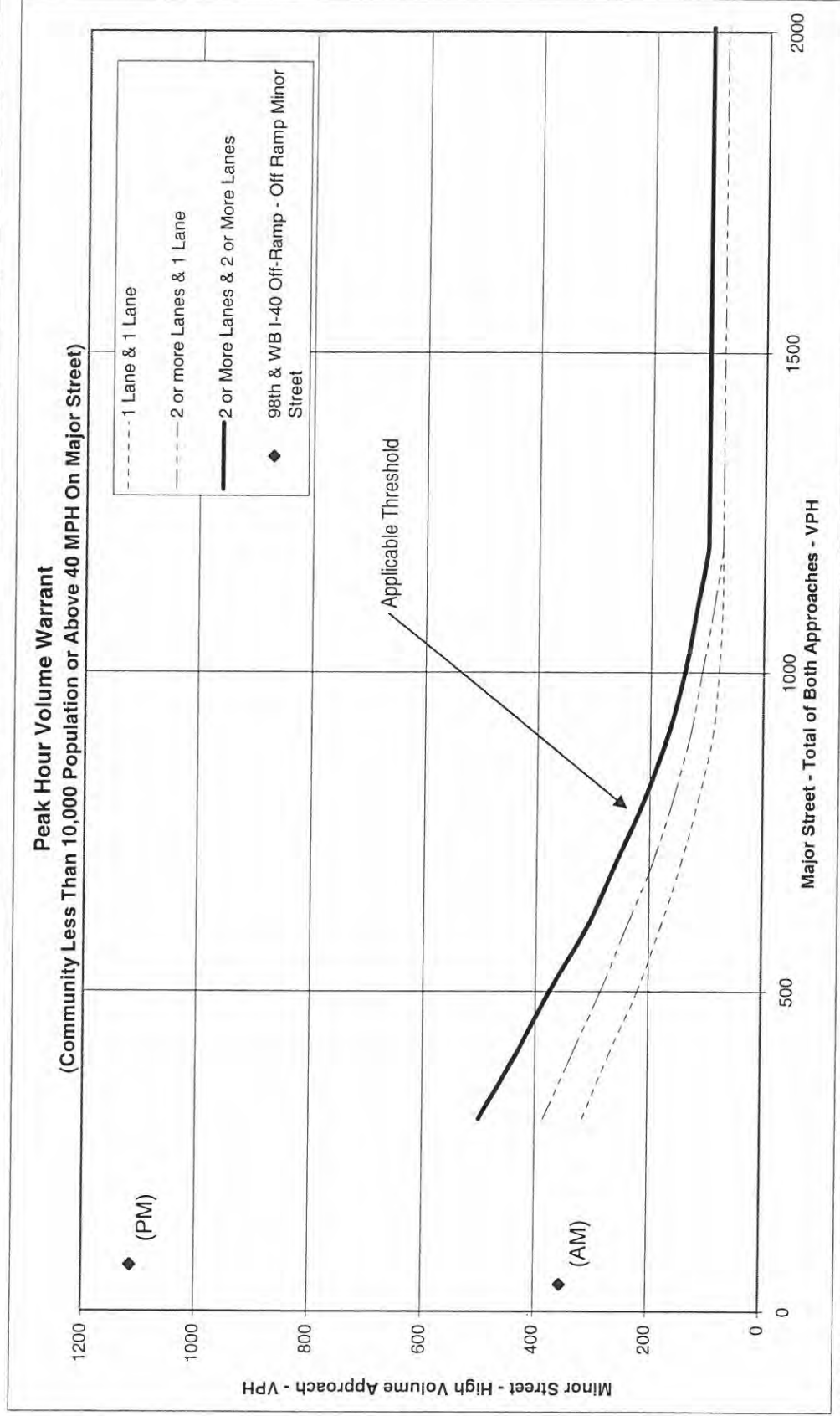
Number of average Arriving Vehicles per cycle = I = 12.6099 ---> 13

P(x)	Poisson Dist	Sum of Poisson Dist	Prob of at least "x" cars arriving	Are "x" automobiles serviced?	Total Queing Length (feet)	
0	0.000002	0.000002	0.00%	serviced	0	
1	0.000029	0.000032	0.00%	serviced	20	
2	0.000191	0.000223	0.02%	serviced	40	
3	0.000828	0.001050	0.11%	serviced	60	
4	0.002690	0.003740	0.37%	serviced	80	
5	0.006994	0.010734	1.07%	serviced	100	
6	0.015153	0.025887	2.59%	serviced	120	
7	0.028141	0.054028	5.40%	serviced	140	
8	0.045730	0.099758	9.98%	serviced	160	
9	0.066054	0.165812	16.58%	serviced	180	
10	0.085870	0.251682	25.17%	serviced	200	
11	0.101483	0.353165	35.32%	serviced	220	
12	0.109940	0.463105	46.31%	serviced	240	
13	0.109940	0.573045	57.30%	serviced	260	
14	0.102087	0.675132	67.51%	serviced	280	
15	0.088475	0.763607	76.36%	serviced	300	
16	0.071886	0.835493	83.55%	serviced	320	
17	0.054972	0.890465	89.05%	serviced	340	
18	0.039702	0.930167	93.02%	serviced	360	
19	0.027164	0.957331	95.73%	capacity exceeded	380	<u><--- Que Length</u>
20	0.017657	0.974988	97.50%	capacity exceeded	400	
21	0.010930	0.985919	98.59%	capacity exceeded	420	

PEAK HOUR VOLUME SIGNAL WARRANT ANALYSIS

Scenario: No Build - 2005
 Intersection: 98th & WB I-40 Off-Ramp - Off Ramp Minor Street
 Type: 2 Lane/2 Lane
 Major Street (Orientation): 98th St (N/S)
 Minor Street (Orientation): WB Off-Ramp (W)

Time	Minor Street Approach Volume			Major Street Approach Volume			Satisfies Warrant 11?
	EB	WB	High Vol Approach	NB	SB	NB + SB	
AM Peak	0	353	353	42	0	42	
PM Peak	0	1,114	1,114	72	0	72	



Note: 100 VPH applies as the lower threshold for minor street approach with 2 or more lanes & 75 VPH as the threshold for a minor street approach with one lane

PEAK HOUR VOLUME SIGNAL WARRANT ANALYSIS

Scenario: No Build - 2005

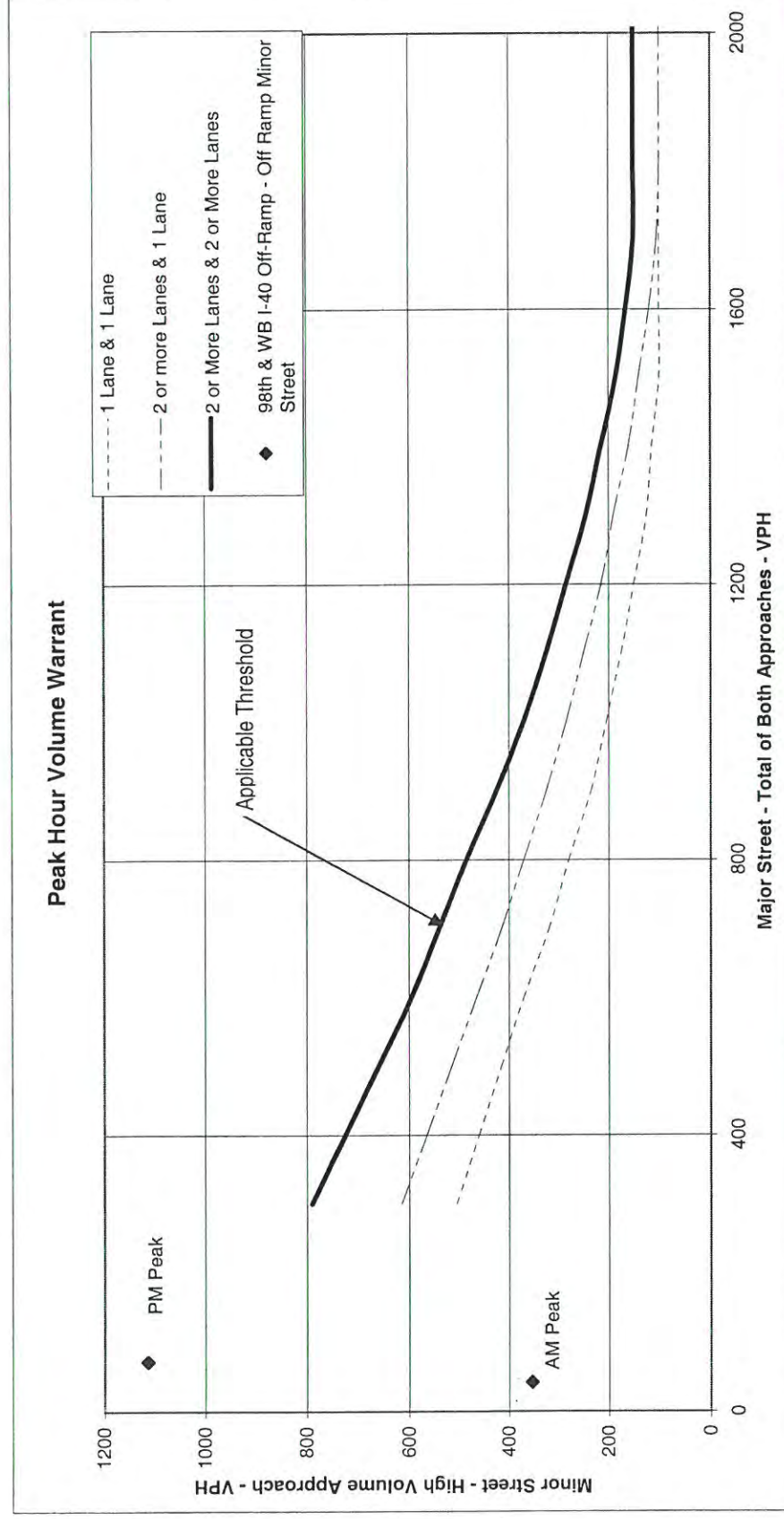
Intersection: 98th & WB I-40 Off-Ramp - Off Ramp Minor Street

Type: 2 Lane/1 Lane

Major Street (Orientation): WB Off-Ramp (W)

Minor Street (Orientation): 98th St (N/S)

Time	Minor Street Approach Volume			Major Street Approach Volume			Satisfies Warrant 11?
	EB	WB	High Vol Approach	NB	SB	NB + SB	
AM Peak	0	353	353	42	0	42	
PM Peak	0	1,114	1,114	72	0	72	

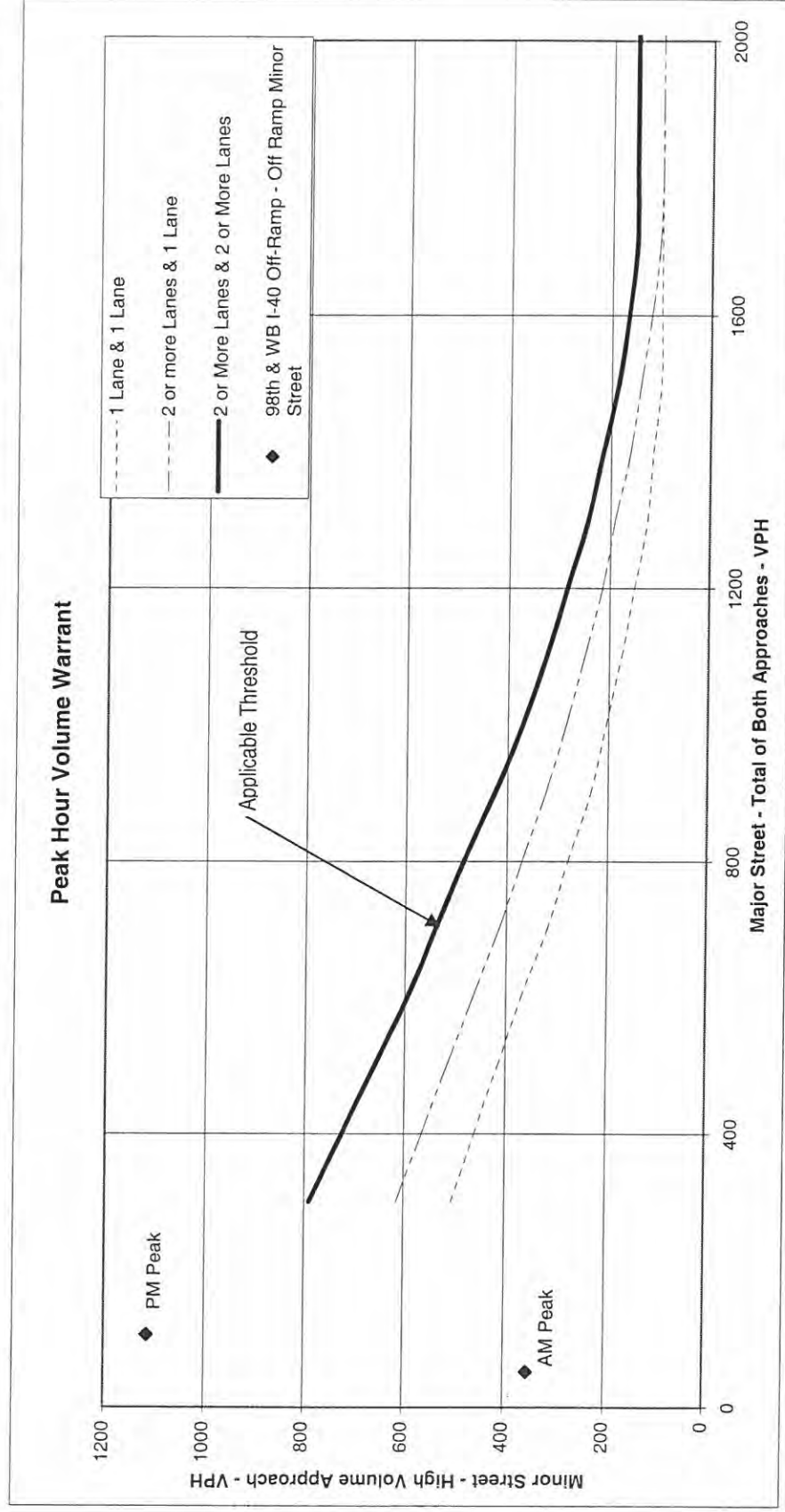


Note: 150 VPH applies as the lower threshold for minor street approach with 2 or more lanes & 100 VPH as the threshold for a minor street approach with one lane

PEAK HOUR VOLUME SIGNAL WARRANT ANALYSIS

Scenario: Build - 2005
 Intersection: 98th & WB I-40 Off-Ramp - Off Ramp Minor Street
 Type: 2 Lane/1 Lane
 Major Street (Orientation): WB Off-Ramp (W)
 Minor Street (Orientation): 98th St (N/S)

Time	Minor Street Approach Volume			Major Street Approach Volume			Satisfies Warrant 11?
	EB	WB	High Vol Approach	NB	SB	NB + SB	
AM Peak	0	353	353	52	0	52	N/A
PM Peak	0	1,114	1,114	106	0	106	N/A

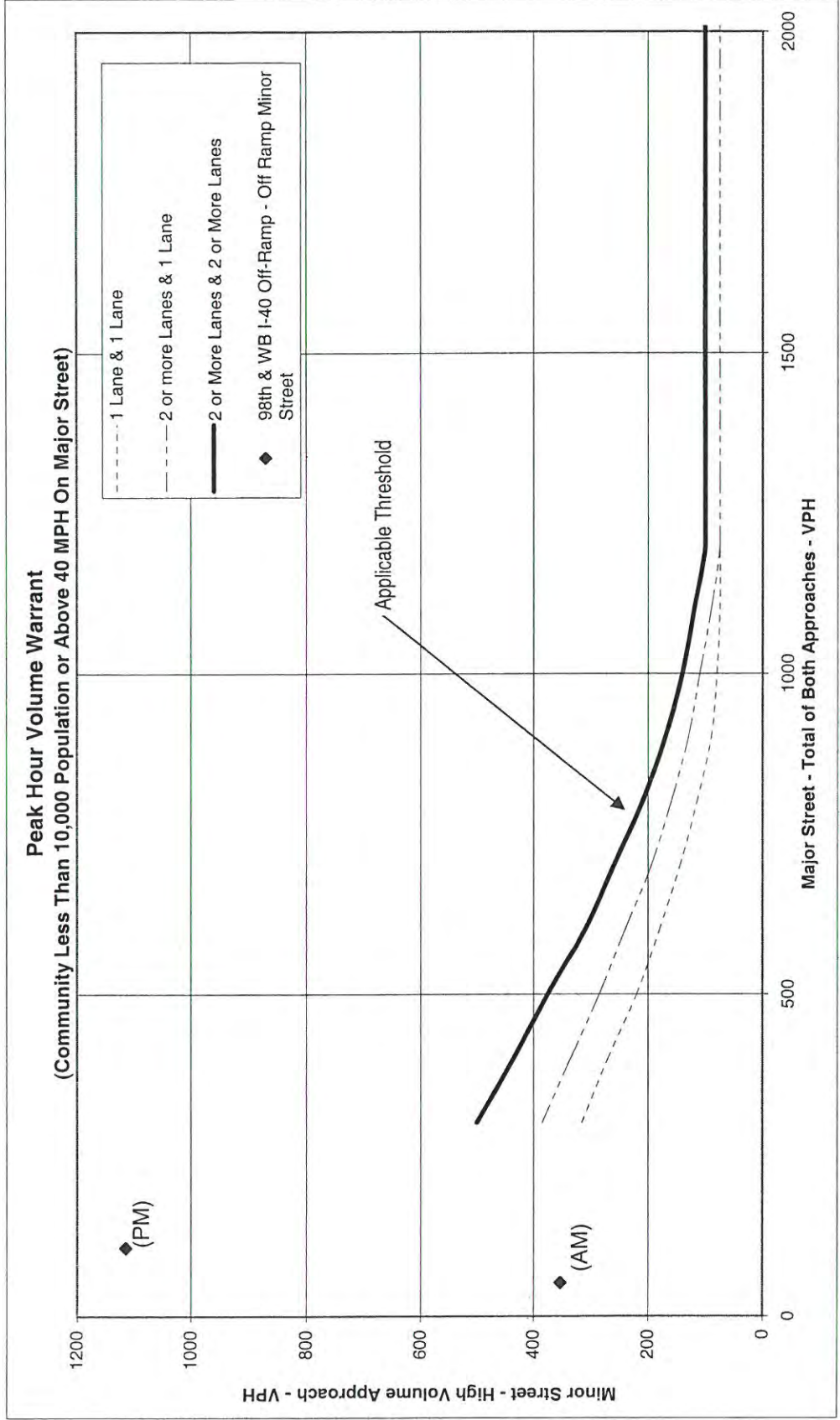


Note: 150 VPH applies as the lower threshold for minor street approach with 2 or more lanes & 100 VPH as the threshold for a minor street approach with one lane

PEAK HOUR VOLUME SIGNAL WARRANT ANALYSIS

Scenario: Build - 2005
 Intersection: 98th & WB I-40 Off-Ramp - Off Ramp Minor Street
 Type: 2 Lane/2 Lane
 Major Street (Orientation): 98th St (N/S)
 Minor Street (Orientation): WB Off-Ramp (W)

Time	Minor Street Approach Volume			Major Street Approach Volume			Satisfies Warrant 11?
	EB	WB	High Vol Approach	NB	SB	NB + SB	
AM Peak	0	353	353	52	0	52	
PM Peak	0	1,114	1,114	106	0	106	



Note: 100 VPH applies as the lower threshold for minor street approach with 2 or more lanes & 75 VPH as the threshold for a minor street approach with one lane

Westland Tract I
 2005 Build
 AM Peak - Signal at WB Off Ramp @ 98th

08/04/03
 16:38:26

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages:

Degree of Saturation (v/c) 0.34 Vehicle Delay 12.8 Level of Service B+

Sq 11 **/**	Phase 1	Phase 2
/ \ North 	*	
	*	
	*	<++++
	v	****
	^	v
	<+ +	
	+ +	
	+ +	
	G/C=0.281	G/C=0.586
	G= 16.9"	G= 35.1"
	Y+R= 4.0"	Y+R= 4.0"
	OFF= 0.0%	OFF=34.8%

C= 60 sec G= 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C		Service Rate		Adj	v/c	HCM	L	Queue
		Reqd	Used	@C (vph)	@E	Volume		Delay	S	Model 1

N Approach

18.0 B

TH	24/2	0.130	0.281	910	995	336	0.338	18.0	*B	120 ft
----	------	-------	-------	-----	-----	-----	-------	------	----	--------

S Approach

17.2 B

TH	24/2	0.018	0.281	910	995	11	0.011	15.6	B	4 ft
LT	12/1	0.092	0.281	201	276	47	0.170	17.6	B	32 ft

E Approach

7.7 A

TH	12/1	0.014	0.586	1070	1091	2	0.002	5.2	A	1 ft
LT	12/1	0.270	0.586	1013	1036	392	0.378	7.7	*A	175 ft

Westland Tract I
 2005 Build
 AM Peak - Signal at WB Off Ramp @ 98th - Dual WB Lefts

08/04/03
 16:44:40

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages:

Degree of Saturation (v/c) 0.23 Vehicle Delay 11.1 Level of Service B+

Sq 11 **/**	Phase 1	Phase 2
. / \ North 	*	
	*	
	*	<++++
	v	****
	^	v
	<+ +	
	+ +	
	+ +	
	G/C=0.404	G/C=0.463
	G= 24.2"	G= 27.8"
	Y+R= 4.0"	Y+R= 4.0"
	OFF= 0.0%	OFF=47.0%

C= 60 sec G= 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C		Service Rate		Adj		HCM	L	Queue
		Reqd	Used	@C (vph)	@E	Volume	v/c	Delay	S	Model 1
N Approach								12.2	B+	
TH	24/2	0.130	0.404	1384	1428	336	0.235	12.2	*B+	100 ft
S Approach								11.5	B+	
TH	24/2	0.018	0.404	1384	1428	11	0.008	10.7	B+	3 ft
LT	12/1	0.092	0.404	350	413	47	0.114	11.7	B+	27 ft
E Approach								10.1	B+	
TH	12/1	0.014	0.463	815	863	2	0.002	8.7	A	1 ft
LT	24/2	0.149	0.463	1565	1590	392	0.247	10.1	*B+	106 ft

Westland Tract I
 2005 Build
 PM Peak - Signal at WB Off Ramp @ 98th

08/04/03
 16:38:09

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages:

Degree of Saturation (v/c) 0.85 Vehicle Delay 26.2 Level of Service C+

Sq 11 **/**	Phase 1	Phase 2
/ \ North 	+	
	+	
	+	<++++
	v	*****
	^	v
	<* +	
	* +	
	* +	
	G/C=0.143	G/C=0.724
	G= 8.6"	G= 43.4"
	Y+R= 4.0"	Y+R= 4.0"
	OFF= 0.0%	OFF=21.0%

C= 60 sec G= 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/ Lanes	g/C		Service Rate		Adj		HCM	L	Queue
		Reqd	Used	@C (vph)	@E	Volume	v/c	Delay	S	Model 1
N Approach									26.1	C+
TH	24/2	0.096	0.143	385	506	216	0.427	26.1	C+	93 ft
S Approach									30.1	C
TH	24/2	0.034	0.143	385	506	38	0.075	22.6	C+	16 ft
LT	12/1	0.138	0.143	85	154	80	0.488	33.7	*C	69 ft
E Approach									25.9	C+
TH	12/1	0.014	0.724	1348	1348	2	0.001	2.3	A	1 ft
LT	12/1	0.699	0.724	1281	1281	1238	0.966	25.9	*C+	1107 ft

Westland Tract I
 2005 Build
 PM Peak - Signal at WB Off Ramp @ 98th - Dual WB Lefts

08/04/03
 16:45:04

SIGNAL2000/TEAPAC[Ver 1.01.00] - Capacity Analysis Summary

Intersection Averages:

Degree of Saturation (v/c) 0.50 Vehicle Delay 10.0 Level of Service B+

Sq 11	Phase 1	Phase 2
/		
/ \ North 	+	
	+	
	+	<++++
	v	****
	^	v
	<* +	
	* +	
	* +	
	G/C=0.232	G/C=0.634
	G= 13.9"	G= 38.1"
	Y+R= 4.0"	Y+R= 4.0"
	OFF= 0.0%	OFF=29.9%

C= 60 sec G= 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= 0.0 sec = 0.0%

Lane Group	Width/Lanes	g/C Req'd	g/C Used	Service Rate @C (vph)	Adj @E	Volume	v/c	HCM Delay	L S	Queue Model 1
N Approach									19.6	B
TH	24/2	0.096	0.232	723	823	216	0.262	19.6	B	81 ft
S Approach									20.6	C+
TH	24/2	0.034	0.232	723	823	38	0.046	18.0	B	14 ft
LT	12/1	0.138	0.232	186	267	80	0.300	21.9	*C+	60 ft
E Approach									7.4	A
TH	12/1	0.014	0.634	1171	1181	2	0.002	4.0	A	1 ft
LT	24/2	0.376	0.634	2177	2177	1238	0.569	7.4	*A	304 ft

CHAPTER 17 - AWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 EB-WB Street LADERA
 NB-SB Street 98TH ST.

Input Data

		EB		WB		NB		SB	
		Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Lane code (Lane 1 is curb lane)				T	L	R	T		
Volume (veh/h)	Left-turn				304				
	Through			0			0		
	Right-turn					103			
Peak-hour factor				.9	.9	.9	.9		
% Heavy vehicles				3	3	3	3		

Outputs

	EB		WB		NB		SB	
	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Total lane flow rate (veh/h)				338	114			
Departure headway, h_d (s)				5.35	4.83			
Degree of utilization, x				.502	.154			
Move-up time, m (s)				2.3	2.3			
Service time, t_s (s)				3.05	2.53			
Capacity (veh/h)				666	702			
Delay (s) (Equation 17-55)				13.3	8.4			
Level of service (Exhibit 17-22)				B	A			
Delay (s), approach			13.3		8.4			
Level of service, approach			B		A			
Delay (s), intersection	12.1							
Level of service, intersection	B							

CHAPTER 17 - AWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 EB-WB Street LADERA
 NB-SB Street 98TH ST.

Input Data

		EB		WB		NB		SB	
		Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Lane code (Lane 1 is curb lane)				T	L	R	T		
Volume (veh/h)	Left-turn				196				
	Through			0			0		
	Right-turn					353			
Peak-hour factor				.9	.9	.9	.9		
% Heavy vehicles				3	3	3	3		

Outputs

	EB		WB		NB		SB	
	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Total lane flow rate (veh/h)				218	392			
Departure headway, h_d (s)				6.03	4.56			
Degree of utilization, x				.365	.497			
Move-up time, m (s)				2.3	2.3			
Service time, t_s (s)				3.73	2.26			
Capacity (veh/h)				573	770			
Delay (s) (Equation 17-55)				12.1	11.7			
Level of service (Exhibit 17-22)				B	B			
Delay (s), approach			12.1		11.7			
Level of service, approach			B		B			
Delay (s), intersection	11.8							
Level of service, intersection	B							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM PEAK BUILD 2005
 Comment BUILD CONDITIONS, 2005

Site Information

Jurisdiction/Date COA 7/24/2003
 Major Street 98TH ST.
 Minor Street I-40 EB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	R			R						R		
Lane 2	T			T						T		
Lane 3	T			T						L		
	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)		51	1061		380	275				1	0	41
PHF		.9	.9		.9	.9				.9	.9	.9
Proportion of heavy vehicles, HV		3	3		3	3				3	3	3
Flow rate		57	1179		422	306				1	0	46
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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	46	791	.058	<1	9.8	A	9.9 A
	2	T				<1			
	3	L	1	490	.002	<1	12.4	B	
		①							
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM PEAK BUILD 2005
 Comment BUILD CONDITIONS, 2005

Site Information

Jurisdiction/Date COA 7/24/2003
 Major Street 98TH ST.
 Minor Street I-40 EB RAMPS

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	R			R						R		
Lane 2	T			T						T		
Lane 3	T			T						L		
	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)		103	473		1131	177				3	0	66
PHF		.9	.9		.9	.9				.9	.9	.9
Proportion of heavy vehicles, HV		3	3		3	3				3	3	3
Flow rate		114	526		1257	197				3	0	73
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

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	73	423	.173	1	15.3	C	16.1
	2	T				<1			
	3	L	3	115	.026	<1	37.2	E	
		①							
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street LADERA
 Minor Street DR.WY.#1

Input Data

Lane Configuration	EB			WB			NB			SB		
Lane 1 (curb)	TR			T			R					
Lane 2	T			T			L					
Lane 3				L								
	EB			WB			NB			SB		
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)		77	26	12	227		78		34			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		86	29	13	252		87		38			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
NB	1	R	39	994	.039	<1	8.8	A	10.2 B
	2	L	88	705	.125	<1	10.8	B	
	3								
SB	1		59						
	2		20						
	3								
		①							
		④	13	1465	.009	<1	7.5	A	

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street LADERA
 Minor Street DR.WY.#1

Input Data

Lane Configuration	EB			WB			NB			SB		
Lane 1 (curb)	TR			T			R					
Lane 2	T			T			L					
Lane 3				L								
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)		262	90	40	146		50		22			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		291	100	44	162		56		24			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
NB	1	R	25	810	.031	<1	9.6	A	12.4 B
	2	L	57	471	.121	<1	13.7	B	
	3								
SB	1		59						
	2		20						
	3								
		①							
		④	44	1157	.038	<1	8.2	A	

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street LADERA
 Minor Street DR.WY.#2

Input Data

Lane Configuration	EB			WB			NB			SB		
Lane 1 (curb)	T			TR						R		
Lane 2	T			T						L		
Lane 3	L											
	EB			WB			NB			SB		
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)	20	91			180	6				17		58
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	22	101			200	7				19		64
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
NB	1		39						
	2		88						
	3								
SB	1	R	65	928	.07	<1	9.2	A	9.5 A
	2	L	20	655	.031	<1	10.7	B	
	3								
		①	22	1355	.016	<1	7.7	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street LADERA
 Minor Street DR.WY.#2

Input Data

Lane Configuration	EB			WB			NB			SB		
Lane 1 (curb)	T			TR						R		
Lane 2	T			T						L		
Lane 3	L											
	EB			WB			NB			SB		
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)	68	217			148	20				11		37
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	76	241			164	22				12		41
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
NB	1		23						
	2		50						
	3								
SB	1	R	42	942	.045	<1	9	A	9.8 A
	2	L	13	508	.026	<1	12.3	B	
	3								
		①	76	1378	.055	<1	7.8	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year AM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street LADERA
 Minor Street DR.WY.#3

Input Data

Lane Configuration	EB			WB			NB			SB		
Lane 1 (curb)	T			R						R		
Lane 2	T			T						L		
Lane 3	L			T								
	EB			WB			NB			SB		
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)	20	88			127	12				34		58
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	22	98			141	13				38		64
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		
Signal upstream of Movement 2 _____ ft Movement 5 _____ ft												
Length of study period (h) <u>.25</u>												

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
NB	1								
	2								
	3								
SB	1	R	64	974	.066	<1	9	A	9.5 A
	2	L	38	719	.053	<1	10.3	B	
	3								
		①	22	1416	.016	<1	7.6	A	
		④							

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst AY
 Agency or Company BHI
 Analysis Period/Year PM PEAK BUILD 2005
 Comment PROPOSED INTERSECTION, 2005 BUILD

Site Information

Jurisdiction/Date COA 7/21/2003
 Major Street LADERA
 Minor Street DR.WY.#3

Input Data

Lane Configuration	EB			WB			NB			SB		
Lane 1 (curb)	T			R						R		
Lane 2	T			T						L		
Lane 3	L			T								
	EB			WB			NB			SB		
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)	68	160			130	40				22		38
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	76	178			144	44				24		42
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .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
NB	1								
	2								
	3								
SB	1	R	42	972	.043	<1	8.9	A	9.9 A
	2	L	24	556	.043	<1	11.8	B	
	3								
		①	76	1375	.055	<1	7.8	A	
		④							