Schematic Design Report

Nine Intersection Improvements

on Midway Road

in the Cities of

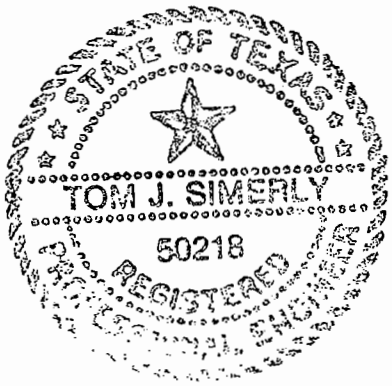
Carrollton, Dallas and Farmers Branch,

and the Town of Addison

Dallas County, Texas

CMAQ Project No. 12

TxDOT Project No. CSJ-0918-45-344



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INTRODUCTION

This Design Report documents the planned improvements, traffic analyses, and design review findings associated with nine intersections located in the Cities of Carrollton, Dallas and Farmers Branch, and the Town of Addison, Texas. The nine intersections under study are:

- Trinity Mills Road at Midway Road
- Spring Valley Road at Midway Road
- Keller Springs Road at Midway Road
- Beltway Drive at Midway Road
- Lindberg Drive at Midway Road
- McEwen Road at Midway Road
- Proton Drive at Midway Road
- Belmeade / Sojourn at Midway Road
- Boyington / Dooley at Midway Road

TTA will do Incorporate Improvements

Signal already constructed

The study includes data collection, traffic analyses, and design issues related to minimum TxDOT standards.

Data Collection

Peak hour counts, including truck and pedestrian data, were taken at all nine intersections. The counts were conducted for the hours of 7:00 to 9:00 A.M. and 4:30 to 6:30 P.M. The traffic volume count summaries are provided in Appendix A.

Additional field data was collected on existing signal phasing, lane usage, turn lane lengths for vehicle storage, and any observed operational characteristics that may be significant.

As-built intersection plans were provided by the Cities of Carrollton, Dallas and Farmers Branch, and the Town of Addison.

Traffic signal coordination plans are not included in this project, but optimal coordination of the signals is assumed. Existing signal coordination is in place and is maintained by each City.

Traffic Analyses

The traffic operations analyses were performed using procedures outlined in the 1994 Highway Capacity Manual for signalized and unsignalized intersections. The AM and PM peak hours were analyzed for both existing and proposed conditions. Existing conditions assumed the existing phasing sequences with timing adjustments to provide optimum outputs. Proposed conditions considered both phasing and timing adjustments which would provide optimum solutions for the proposed geometrics.

The operations analyses were performed using the CINEMA 3.0 software package for the signalized intersections and the HCS software package for the unsignalized intersection. Appendix B contains the detailed analyses outputs.

Table 1 summarizes the capacity analysis results, the level of service and the reduction in delay for each of the intersections. A summary of the projected emissions and travel time benefits resulting from the proposed improvements are shown in Table 2.

Table 1
Capacity Analysis Summary
for Midway Road Intersections

Intersection		Existing		Proposed CMAQ Improvements				Final Recommended Improvements			
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Reduction in Delay*	PM Peak Reduction in Delay*	AM Peak Hour	PM Peak Hour	AM Peak Reduction in Delay*	PM Peak Reduction in Delay*
Trinity Mills Road	LOS	F	F	D	D	23.6 sec/veh	27.6 sec/veh				
	V/C	1.01	1.13	0.93	0.94	39.3%	46.0%				
Spring Valley Road	LOS	E	F	D	D	22.8 sec/veh	55.3 sec/veh				
	V/C	1.02	1.08	0.85	0.93	46.3%	64.2%				
Keller Springs Road	LOS	E	D	F	C	-10.5 sec/veh	3.5 sec/veh	D	C	23.4 sec/veh	3.6 sec/veh
	V/C	1.01	0.94	1.11	0.82	-21.0%	13.5%	0.96	0.77	46.8%	13.9%
Beltway Drive	LOS	D	C	D	C	1.5 sec/veh	0 sec/veh				
	V/C	1.00	0.85	0.96	0.85	4.0%	0%				
Lindberg Drive	LOS	D	F	C	D	5.7 sec/veh	34.7 sec/veh	C	C	7.2 sec/veh	46.9 sec/veh
	V/C	0.93	1.12	0.85	0.91	21.3%	49.3%	0.77	0.90	27.0%	66.6%
McEwen Road	LOS	D	D	C	C	8.2 sec/veh	10.7 sec/veh				
	V/C	0.91	0.96	0.76	0.78	30.8%	37.5%				
Proton Drive	LOS	C	D	C	D	2.5 sec/veh	2.0 sec/veh	C	C	1.4 sec/veh	9.5 sec/veh
	V/C	0.77	1.01	0.77	0.90	12.8%	6.3%	0.75	0.75	4.4%	29.9%
Belmeade / Sojourn	LOS	E	E	D	D	20.8 sec/veh	19.0 sec/veh	D	D	29.7 sec/veh	20.4 sec/veh
	V/C	1.18	1.05	0.99	0.91	35.6%	41.0%	0.91	0.89	50.8%	44.1%
Boyington / Dooley (existing stop controlled)	LOS	F	F	A	B	896 sec/veh	888 sec/veh				
	V/C	>1.0	>1.0	0.78	0.69	99.6%	98.7%				

* Note: Reduction in delay is compared to the calculated delay from existing conditions.

LOS = Level of service
V/C = Volume / Capacity

Table 2
Emissions and Travel Time Benefits Summary

Midway Road Intersection	Benefits with Recommended Improvements	
	Annual Hydrocarbons Emissions Reduction in Pounds HC / Year	Annual Travel Time Savings in Dollars / Year
Trinity Mills Road	7,049	$168,170
Spring Valley Road	7,242	$288,100
Keller Springs Road	1,014	$59,980
Beltway Drive	11	$3,720
Lindberg Drive	4,048	$113,970
McEwen Road	569	$44,740
Proton Drive	820	$26,630
Belmeade/Sojourn	3,411	$108,910
Boyington/Dooley	3,774	$185,630
Totals:	27,938	$999,850

* Note: Travel time savings per year were calculated for the AM and PM peak hours only, and weekdays only. Dollar value of time was assumed at $7/hour. The hydrocarbon savings for Boyington/Dooley was assumed at 100 grams for both peak periods. No actual value for existing was available with no signal at the intersection.

Design Issues

Design drawings have been developed based on the traffic analysis for each intersection. Construction cost estimates and the corresponding project budget is summarized in Table 3. Every attempt has been made to work within the original budget that was established by the Dallas County CMAQ Program office, while also maintaining the established design standards and criteria. Minimum design criteria and standards have been met throughout the project, and desirable standards have been met where possible.

Table 3 shows that some individual projects have exceeded their specified budget, the most significant of which is Trinity Mills Road. However, several projects are also shown to come in below their specified budgets, which would allow the overall budget to be met if the funds could be redistributed.

Table 3
Construction Cost Estimates and Project Budget

Intersection	Jurisdiction	Construction Cost	ROW Cost	Other Costs*	Project Budget	Under (Over) Budget
Trinity Mills Road	Carrollton/ Dallas	$558,937	$248,184	$196,524	$750,000	($253,645)
Spring Valley Road	Addison/ Farmers Branch	$443,394	$156,060	$183,620	$1,750,000	$966,926
Keller Springs Road	Carrollton/ Addison	$292,865	$156,060	$106,261	$530,000	($25,186)
Beltway Drive	Addison	$29,785	$12,204	$10,834	$55,000	$2,177
Lindberg Drive	Addison	$58,582	$13,932	$21,231	$105,000	$11,255
McEwen Road	Farmers Branch	$94,316	$27,000	$32,885	$115,000	($39,201)
Proton Drive	Addison/ Farmers Branch	$103,391	$33,372	$35,783	$115,000	($57,546)
Belmeade/ Sojourn	Carrollton	$167,888	$68,256	$58,903	$220,000	($75,047)
Boyington/ Dooley	Addison/ Carrollton	$55,479	$23,976	$21,439	$155,000	$54,106
Totals:		$1,804,637	$739,044	$667,481	$3,795,000	$583,838

NOT BUILT BY CMAQ

* Other Costs consist of 20% PS & E cost plus County and State construction/administration costs as listed in Appendix C.

SPRING VALLEY ROAD

Existing Conditions

Analysis of the existing traffic conditions at the Midway Road intersection with Spring Valley Road shows operations at LOS "E" for the AM peak and LOS "F" for the PM peak hour. Each of the four approaches currently have an exclusive left turn lane. The northbound and southbound approaches also have an exclusive right turn lane. Both roadways have six-lane cross sections. Existing peak hour traffic counts are shown in Figure 2.

Proposed CMAQ Improvements

The proposed CMAQ improvements would result in all four approaches having dual left turn lanes and an exclusive right turn lane. The analysis of these improvements show LOS "D" operations for the AM and PM peak hours, with room for some growth in traffic. Recommended storage lengths are shown in Table 6. Table 7 lists the design criteria used for the geometric design of the intersection.

Midway Road is currently under design for widening to an eight-lane roadway between LBJ Freeway and Spring Valley Road. The current design for this widening is accounted for in the geometrics for the intersection.

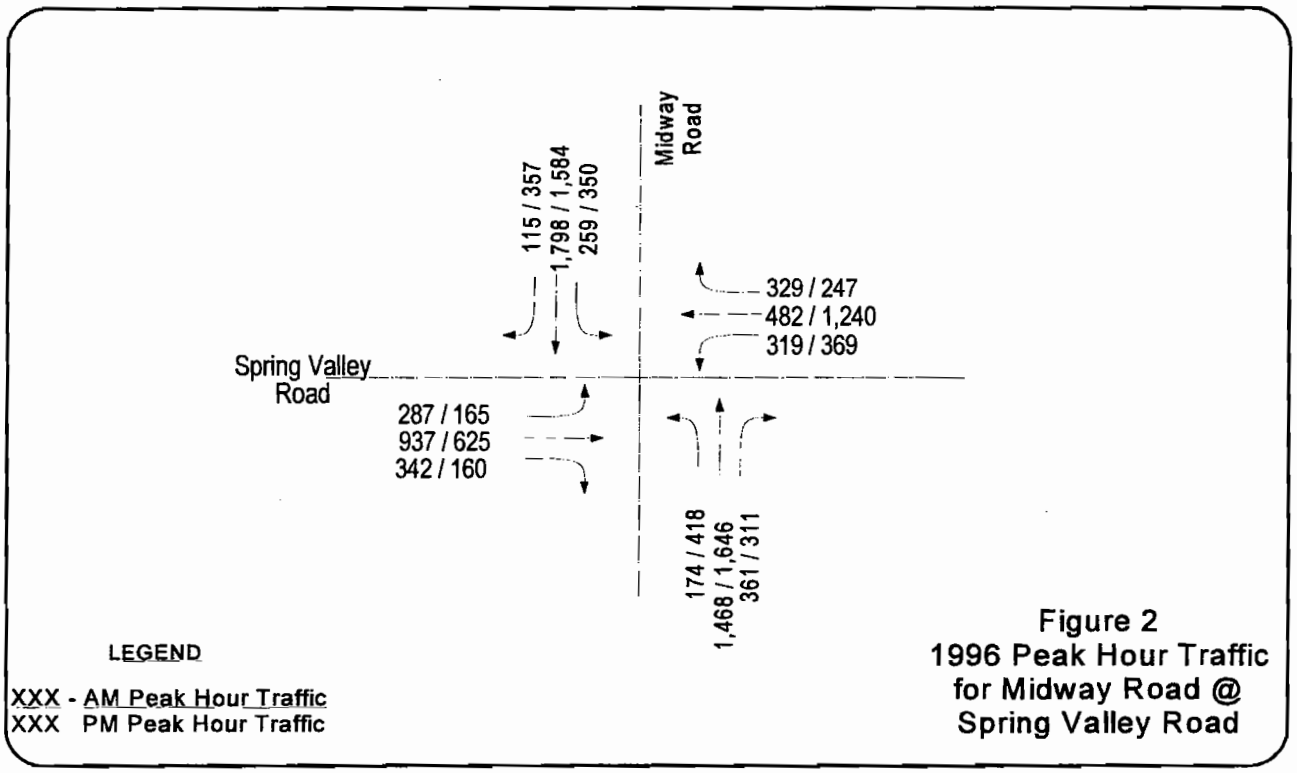


Figure 2
1996 Peak Hour Traffic
for Midway Road @
Spring Valley Road

Table 6
Geometrics and Storage Lengths for Spring Valley Road at Midway Road

Approach	Move-ment	Existing			Proposed CMAQ Improvements		
		# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)
Eastbound	Left	1	200	61	2	150	46
	Through	2.5			3		
	Right	0.5	N/A	N/A	1	200	61
Westbound	Left	1	115	35	2	250	76
	Through	2.5			3		
	Right	0.5	N/A	N/A	1	250	76
Northbound	Left	1	160	49	2	225	69
	Through	3			3		
	Right	1	110	34	1	N/A	N/A
Southbound	Left	1	200	61	2	225	69
	Through	3			*3.5*		
	Right	1	N/A	N/A	*0.5*	N/A	N/A

Table 7
Geometric Design Criteria for Spring Valley Road at Midway Road

Item	Measurements				Comments
	Northbound	Southbound	Eastbound	Westbound	
Posted Speed, MPH (KPH)	35 (60)	40 (65)	35 (60)	35 (60)	Posted speed limit
Design Vehicle	WB-62	WB-62	WB-50	WB-50	O & P Manual, 4-710 D
Width of Travel Lanes, Ft (m)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	O & P Manual, Fig. 4-26
Width of Right Turn Lane, Ft (m)	11 (3.3)	11 (3.3)	11 (3.3)	11 (3.3)	
Width of Left Turn Lane, Ft (m)	11 (3.3)	11 (3.3)	11 (3.3)	11 (3.3)	
Offset to Face of Curb, Ft (m)	2 (0.6)	2 (0.6)	2 (0.6)	2 (0.6)	O & P Manual, Fig. 4-26
Median Width, Ft (m)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	O & P Manual, 4-302 B
Right of Way Width, Ft (m)	N/A	10 (3.0)	10 (3.0)	15 (4.6)	From edge of proposed curb to proposed ROW
Sidewalk Width, Ft (m)	5 (1.5)	5 (1.5)	5 (1.5)	5 (1.5)	ADA Standards
Clear Zone Width, Ft (m)	1.5 (0.5)	1.5 (0.5)	1.5 (0.5)	1.5 (0.5)	O & P Manual, Fig. 4-21
Turning Radii, Ft (m)	50 (15)	50 (15)	50 (15)	50 (15)	O & P Manual, 4-710 D
Transition Length, Ft (m) R1, Ft (m) R2, Ft (m)	N/A	125 (38)	125 (38)	R1, 300 (91) R2, 150 (46)	O & P Manual, 4-710 D, AASHTO
Storage Requirements, Ft (m)	L- 400(182) R- 200 (61)	L- 400(122)	L- 300 (92) R- 200(61)	L- 400(122) R- 200 (61)	Computed results of analysis.
Actual Storage, Ft (m)	L- 400(182) R- 200 (61)	L- 400(122)	L- 300 (92) R- 200(61)	L- 400(122) R- 200 (61)	Within standards from O & P Manual, 4-710 D, AASHTO

KELLER SPRINGS ROAD

Existing Conditions

Analysis of the existing traffic conditions at the Midway Road intersection with Keller Springs Road shows operations at LOS "E" for the AM peak and LOS "D" for the PM peak hour. Each of the four approaches currently have an exclusive left turn lane. The eastbound approach has an exclusive right turn lane and the northbound and southbound approaches also have short right turn separations. Keller Springs Road is a two-lane roadway on the east side and a four-lane roadway on the west side. Midway Road has a six-lane cross section. Existing peak hour traffic counts are shown in Figure 3.

Proposed CMAQ Improvements

The proposed CMAQ improvements include widening the northbound, eastbound and southbound approaches to include dual left turn lanes and an exclusive right turn lane. The eastbound approach would also be widened to include two through lanes, which would narrow quickly to one lane on the east side. These improvements showed intersection operations would be at a LOS of "F" in the AM peak hour and LOS "C" in the PM peak hour. Although the physical capacity increases with the proposed geometric improvements, the worsening of intersection operations in the AM peak is due to the change in signal phasing as a result of the dual left turns and the heavy eastbound right turn movement. The dual left turn lanes prohibit the use of permissive left turns on the green phase for the through and right turning traffic. Therefore, due to the fact that the 840 right-turning vehicles requires a significant portion of the green time, the left-turning traffic actually has less opportunity per cycle, even though there would now be two lanes to move and store the traffic in.

Additional Improvements

The existing eastbound through volume (less than 100 vehicles during the peak hours) does not currently warrant two lanes. Therefore, it is recommended that the existing lane balance be maintained by carrying only one eastbound through lane across the intersection. It is also recommended that a dual right turn be installed for the eastbound approach. This would still result in recommending the widening of the eastbound approach to five lanes but with the following geometrics: a dual left turn, one through lane and a dual right turn. These changes to the recommended improvements would result in operations of LOS "D" in the AM peak and LOS "C" in the PM peak. The recommended storage lengths are shown in Table 8. Table 9 shows the design criteria used for the geometric design of this intersection.

Once the portion of Keller Springs under Addison Airport is opened, a re-evaluation of the lane assignments will be necessary.

CONSTRUCTION OF SIGNAL WILL BE DONE BY NTTA

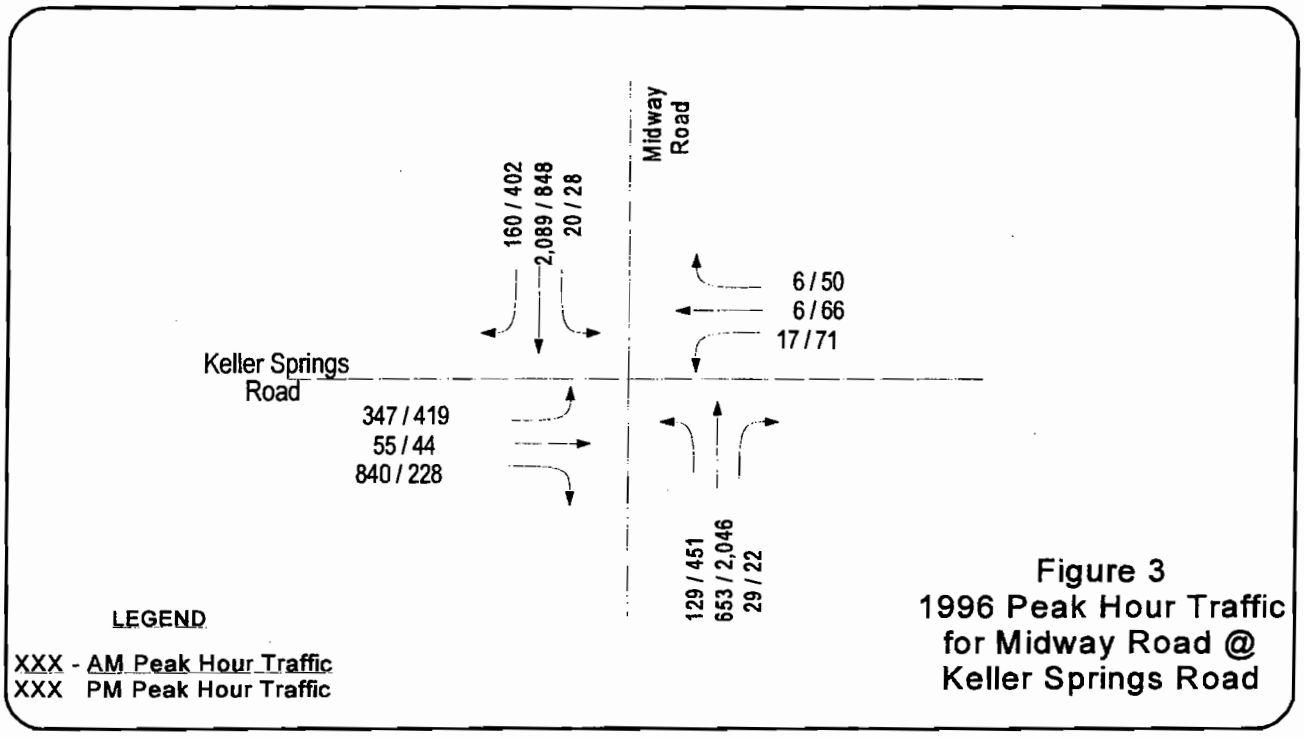


Figure 3
1996 Peak Hour Traffic
for Midway Road @
Keller Springs Road

Table 8
Geometrics and Storage Lengths for Keller Springs Road at Midway Road

Approach	Move-ment	Existing			Proposed CMAQ Improvements			Final Recommended Improvements		
		# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)
Eastbound	Left	1	150	46	2	150	46	2	150	46
	Through	1			2			1		
	Right	1	N/A	N/A	1	300	91	2	100	30
Westbound	Left	1	50	15	1	50	15	1	100	30
	Through	0.5			0.5			0.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A	0.5	N/A	N/A
Northbound	Left	1	210	64	2	200	61	2	200	61
	Through	3			3			3		
	Right	1	50	15	1	200	61	1	200	61
Southbound	Left	1	150	46	2	200	61	2	150	46
	Through	3			3			3		
	Right	1	50	15	1	200	61	1	250	76

Table 9
Geometric Design Criteria for Keller Springs Road at Midway Road

Item	Measurements				Comments
	Northbound	Southbound	Eastbound	Westbound	
Posted Speed, MPH (KPH)	40 (65)	40 (65)	30 (50)	30 (50)	Posted speed limit
Design Vehicle	WB-62	WB-62	WB-50	WB-50	O & P Manual, 4-710 D
Width of Travel Lanes, Ft (m)	11 (3.3)	11 (3.3)	11 (3.3)	N/A	O & P Manual, Fig. 4-26
Width of Right Turn Lane, Ft (m)	11 (3.3)	11 (3.3)	10 (3.0)	N/A	
Width of Left Turn Lane, Ft (m)	10 (3.0)	11 (3.3)	10 (3.0)	11 (3.3)	
Offset to Face of Curb, Ft (m)	2 (0.6)	2 (0.6)	2 (0.6)	2 (0.6)	O & P Manual, Fig. 4-26
Median Width, Ft (m)	N/A	N/A	12 (3.6)	12 (3.6)	O & P Manual, 4-302 B
Right of Way Width, Ft (m)	10 (3.0)	10 (3.0)	10 (3.0)	N/A	From edge of proposed curb to proposed ROW
Sidewalk Width, Ft (m)	N/A	N/A	N/A	N/A	ADA Standards
Clear Zone Width, Ft (m)	1.5 (0.5)	1.5 (0.5)	1.5 (0.5)	1.5 (0.5)	O & P Manual, Fig. 4-21
Turning Radii, Ft (m)	75 (23)	75 (23)	50 (15)	50 (15)	O & P Manual, 4-710 D
Transition Length, Ft (m) R1, Ft (m) R2, Ft (m)	132 (40)	125 (38)	127 (35.5)	N/A	O & P Manual, 4-710 D, AASHTO
Storage Requirements, Ft (m)	L- 400 (122) R- 200 (61)	L- 300 (92) R- 250 (76)	L- 300 (92) R- 200(61)	N/A	Computed results of analysis.
Actual Storage, Ft (m)	L- 420 (128) R- 200 (61)	L-400 (124) R- 200 (61)	L-275(83) R- 200 (61)	N/A	Within standards from O & P Manual, 4-710 D, AASHTO

BELTWAY DRIVE

Existing Conditions

Analysis of the existing traffic conditions at the intersection of Midway Road and Beltway Drive shows operations at LOS "D" for the AM peak and LOS "C" for the PM peak hour. Each of the four approaches currently have an exclusive left turn lane. The eastbound, northbound and southbound approaches each have an exclusive right turn lane. Beltway Drive is a two-lane roadway. Midway Road has a six-lane cross section. Existing peak hour traffic counts are shown in Figure 4.

Proposed CMAQ Improvements

The proposed CMAQ improvements include lengthening the storage lengths for the northbound and westbound turn lanes. The proposed restriping/marking for the eastbound approach is currently in place. These improvements would result in maintaining the intersection operations at the same LOS, but with slightly less average delay per vehicle in the AM peak. The recommended storage lengths are shown in Table 10. Table 11 shows the design criteria used for the geometric design of this intersection.

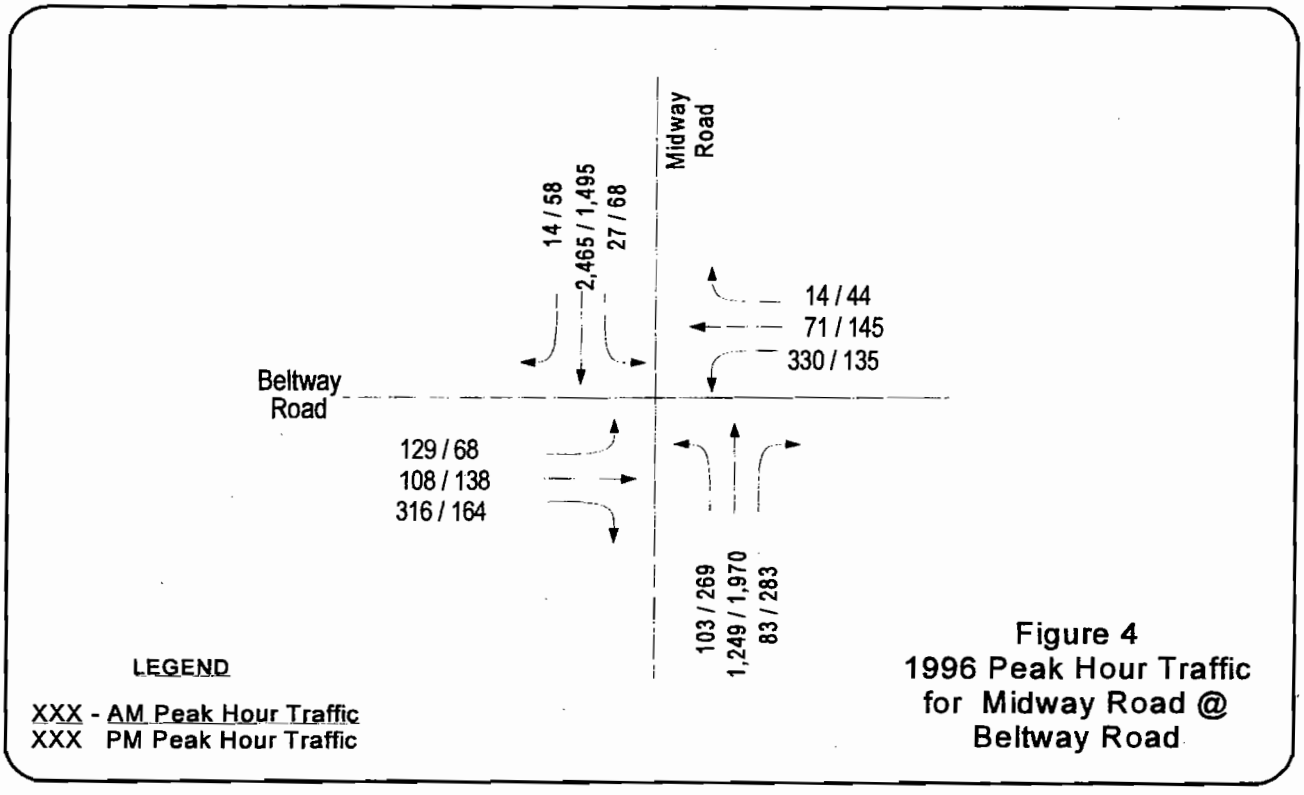


Figure 4
1996 Peak Hour Traffic
for Midway Road @
Beltway Road

Table 10
Geometrics and Storage Lengths for Beltway Drive at Midway Road

Approach	Move-ment	Existing			Proposed CMAQ Improvements		
		# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)
Eastbound	Left	1	75	23	1	150	46
	Through	1			1		
	Right	1	75	23	1	150	46
Westbound	Left	1	125	38	1	150	46
	Through	0.5			0.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A
Northbound	Left	1	115	35	1	150	46
	Through	3			3		
	Right	1	75	23	1	150	46
Southbound	Left	1	100	30	1	100	30
	Through	3			3		
	Right	1	100	30	1	100	30

Table 11
Geometric Design Criteria for Beltway Drive at Midway Road

Item	Measurements				Comments
	Northbound	Southbound	Eastbound	Westbound	
Posted Speed, MPH (KPH)	40 (65)	40 (65)	30 (50)	30 (50)	Posted speed limit
Design Vehicle	WB-62	WB-62	WB-50	WB-50	O & P Manual, 4-710 D
Width of Travel Lanes, Ft (m)	11 (3.3)	N/A	N/A	12 (3.6)	O & P Manual, Fig. 4-26
Width of Right Turn Lane, Ft (m)	11 (3.3)	N/A	N/A	N/A	
Width of Left Turn Lane, Ft (m)	11 (3.3)	N/A	N/A	11 (3.3)	
Offset to Face of Curb, Ft (m)	2 (0.6)	N/A	N/A	2 (0.6)	O & P Manual, Fig. 4-26
Median Width, Ft (m)	N/A	N/A	N/A	N/A	
Right of Way Width, Ft (m)	10 (3.0)	N/A	N/A	N/A	From edge of proposed curb to proposed ROW
Sidewalk Width, Ft (m)	5 (1.5)	N/A	N/A	N/A	ADA Standards
Clear Zone Width, Ft (m)	1.5 (0.5)	N/A	N/A	1.5 (0.5)	O & P Manual, Fig. 4-21
Turning Radii, Ft (m)	N/A	N/A	N/A	50 (15)	O & P Manual, 4-710 D
Transition Length, Ft (m) R1, Ft (m) R2, Ft (m)	125 (38)	N/A	N/A	125 (38)	O & P Manual, 4-710 D, AASHTO
Storage Requirements, Ft (m)	L- 150 (46) R- 150 (46)	N/A	L- 150 (46) R- 150(46)	L- 150 (46)	Computed results of analysis.
Actual Storage, Ft (m)	L- 150 (46) R- 150 (46)	L-100 (30) R- 100 (30)	L- 75 (23) R- 75 (23)	L- 150 (46) R- N/A	Within standards from O & P Manual, 4-710 D, AASHTO

LINDBERG DRIVE

Existing Conditions

Analysis of the existing traffic conditions at the intersection of Midway Road and Lindberg Drive shows operations at LOS "D" for the AM peak and LOS "F" for the PM peak hour. The northbound and southbound approaches currently have an exclusive left turn lane. The eastbound and westbound approaches each have an exclusive right turn lane. Lindberg Drive is a two-lane roadway, east of the intersection and a three-lane roadway west of the intersection. Midway Road has a six-lane cross section. Existing peak hour traffic counts are shown in Figure 5.

Proposed CMAQ Improvements

The proposed CMAQ improvements are to widen the westbound approach to include an exclusive left turn lane and to increase the right turning radius for the northbound approach. The eastbound approach is shown in the schematic as currently having an exclusive left turn lane and a through right lane. However, a field survey showed the existing signing and markings for a through-left lane and an exclusive right turn lane. With the addition of an exclusive left turn lane on the westbound approach, it would be advantageous to complement the left turn movement with an exclusive left turn lane on the eastbound approach. The proposed CMAQ improvements, in combination with restriping the eastbound approach for an exclusive left turn lane and a through-right lane, would result in a LOS of "C" for the AM peak and LOS "D" for the PM peak.

Additional Improvements

There is capacity available for some traffic growth with the proposed CMAQ improvements, but the eastbound and westbound approaches would still be operating at LOS "F" and "E", respectively, in the PM peak. Alternatives were evaluated with the goal of providing a more balanced LOS for each of the approaches as well as an acceptable LOS for the intersection itself.

The first alternative consisted of adding a dual left turn at the southbound approach along with the proposed CMAQ improvements and increasing the storage lengths for many of the turn bays. This resulted in approximately the same average delay for the overall intersection, but the LOS for each of the separate approaches was more balanced, with the northbound, eastbound and westbound approaches at LOS "D" and the southbound approach at LOS "C" in the PM peak.

The second alternative added a right turn to the eastbound approach along with the proposed CMAQ improvements. The resultant evaluation showed the overall intersection LOS as "C" in the AM and PM peaks, with the eastbound and westbound approaches at LOS "D" in the PM peak. All other approaches are at LOS "C" or better. This represents a better result than the proposed CMAQ improvements appear to promote, but would also be more costly. Recommended storage lengths are shown in Table 12. Table 13 shows the design criteria used for the geometric design of this intersection.

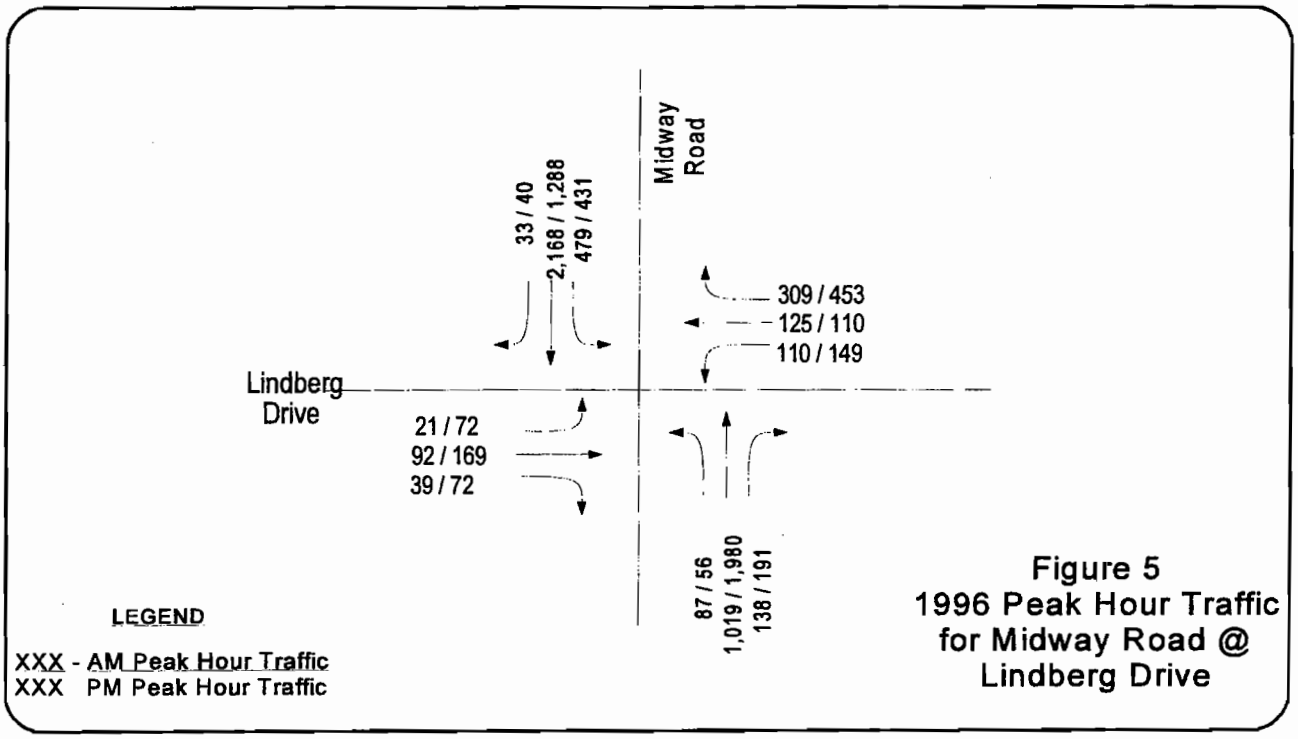


Figure 5
1996 Peak Hour Traffic
for Midway Road @
Lindberg Drive

Table 12
Geometrics and Storage Lengths for Lindberg Drive at Midway Road

Approach	Move-ment	Existing			Proposed CMAQ Improvements			Final Recommended Improvements		
		# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)
Eastbound	Left	0.5	N/A	N/A	1	N/A	N/A	1	100	30
	Through	0.5			0.5			1		
	Right	1	N/A	N/A	0.5	N/A	N/A	1	N/A	N/A
Westbound	Left	0.5	N/A	N/A	1	125	38	1	100	30
	Through	0.5			1			1		
	Right	1	125	38	1	125	38	1	150	46
Northbound	Left	1	160	49	1	160	49	1	160	49
	Through	2.5			2.5			2.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A	0.5	N/A	N/A
Southbound	Left	1	200	61	1	200	61	1	200	61
	Through	2.5			2.5			2.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A	0.5	N/A	N/A

Table 13
Geometric Design Criteria for Lindberg Drive at Midway Road

Item	Measurements				Comments
	Northbound	Southbound	Eastbound	Westbound	
Posted Speed, MPH (KPH)	40 (65)	40 (65)	30 (50)	30 (50)	Posted speed limit
Design Vehicle	WB-62	WB-62	WB-50	WB-50	O & P Manual, 4-710 D
Width of Travel Lanes, Ft (m)	N/A	N/A	12 (3.6)	12 (3.6)	O & P Manual, Fig. 4-26
Width of Right Turn Lane, Ft (m)	N/A	N/A	11 (3.3)	11 (3.3)	
Width of Left Turn Lane, Ft (m)	N/A	N/A	11 (3.3)	11 (3.3)	
Offset to Face of Curb, Ft (m)	N/A	N/A	2 (0.6)	2 (0.6)	O & P Manual, Fig. 4-26
Median Width, Ft (m)	N/A	N/A	N/A	N/A	
Right of Way Width, Ft (m)	varies	N/A	N/A	N/A	From edge of proposed curb to proposed ROW
Sidewalk Width, Ft (m)	N/A	N/A	N/A	N/A	ADA Standards
Clear Zone Width, Ft (m)	1.5 (0.5)	N/A	1.5 (0.5)	1.5 (0.5)	O & P Manual, Fig. 4-21
Turning Radii, Ft (m)	75 (23)	N/A	50 (15)	N/A	O & P Manual, 4-710 D
Transition Length, Ft (m) R1, Ft (m) R2, Ft (m)	N/A	N/A	R1,	R1, 184 (56) R2, 320 (98)	O & P Manual, 4-710 D, AASHTO
Storage Requirements, Ft (m)	L- 160 (49)	L- 200 (61)	L- 100 (30)	L- 100 (30) R- 150 (46)	Computed results of analysis.
Actual Storage, Ft (m)	L- 160 (49) R- N/A	L-200(61) R- N/A	L-100 (30) R- N/A	L- 125 (38) R- 150 (46)	Within standards from O & P Manual, 4-710 D, AASHTO

PROTON DRIVE

Existing Conditions

Analysis of the existing traffic conditions at the Midway Road intersection with Proton Drive shows operations at LOS "C" for the AM peak and LOS "D" for the PM peak hour. The northbound and southbound approaches currently have an exclusive left turn lane. The eastbound approach has an exclusive right turn lane. Proton Drive is a three-lane roadway. Midway Road has a six-lane cross section. Existing peak hour traffic counts are shown in Figure 7.

Proposed CMAQ Improvements

The proposed CMAQ improvements include widening the existing two lanes on the westbound approach and restriping these lanes to an exclusive left turn lane and a through-right lane. The eastbound approach is proposed to be widened to include dual right turn lanes and a through-left lane. These improvements showed intersection operations would improve slightly but the LOS would still be "C" in the AM peak hour and "D" in the PM peak hour.

Additional Improvements

Various phasing alternatives were tested for different geometric alternatives, including the proposed CMAQ improvements. However, analysis showed that the existing laneage could be used along with restriping of the westbound approach, improved signal phasing, and increased storage lengths. The westbound approach would be restriped to match the existing eastbound approach for an exclusive right turn lane and a through-left lane. This alternative would provide operations at LOS "C" for the AM and PM peak hours. The recommended storage lengths are shown in Table 16. Table 17 shows the design criteria used for the geometric design of this intersection.

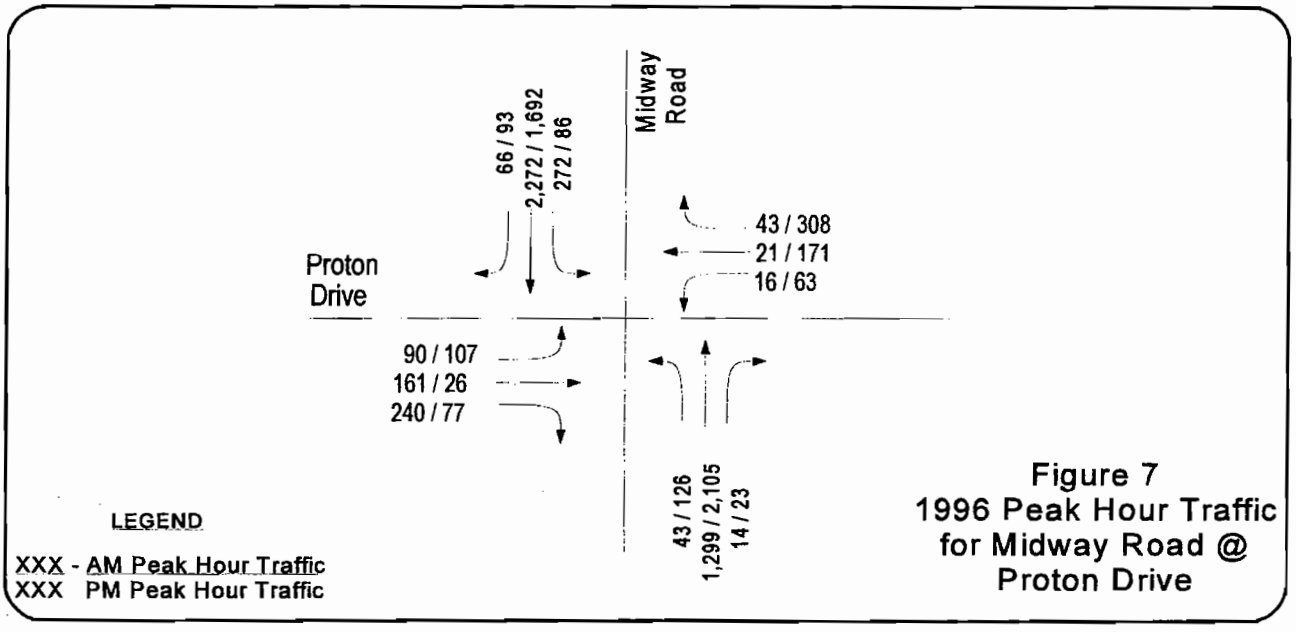


Figure 7
1996 Peak Hour Traffic
for Midway Road @
Proton Drive

Table 16
Geometrics and Storage Lengths for Proton Drive at Midway Road

Approach	Move-ment	Existing			Proposed CMAQ Improvements			Final Recommended Improvements		
		# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)
Eastbound	Left	0.5	N/A	N/A	0.5	N/A	N/A	0.5	N/A	N/A
	Through	0.5			0.5			0.5		
	Right	1	80	24	2	100	30	1	100	30
Westbound	Left	0.5	N/A	N/A	1	N/A	N/A	0.5	N/A	N/A
	Through	1			0.5			0.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A	1	N/A	N/A
Northbound	Left	1	85	26	1	150	46	1	175	53
	Through	2.5			2.5			2.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A	0.5	N/A	N/A
Southbound	Left	1	100	30	1	200	61	1	250	76
	Through	2.5			2.5			2.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A	0.5	N/A	N/A

Table 17
Geometric Design Criteria for Proton Drive at Midway Road

Item	Measurements				Comments
	Northbound	Southbound	Eastbound	Westbound	
Posted Speed, MPH (KPH)	40 (65)	40 (65)	30 (50)	30 (50)	Posted speed limit
Design Vehicle	WB-62	WB-62	WB-50	WB-50	O & P Manual, 4-710 D
Width of Travel Lanes, Ft (m)	N/A	N/A)	12 (3.6)	12 (3.6)	O & P Manual, Fig. 4-26
Width of Right Turn Lane, Ft (m)	N/A	N/A	11 (3.3)	11 (3.3)	
Width of Left Turn Lane, Ft (m)	N/A	N/A	11 (3.3)	11 (3.3)	
Offset to Face of Curb, Ft (m)	2 (0.6)	2 (0.6)	2 (0.6)	2 (0.6)	O & P Manual, Fig. 4-26
Median Width, Ft (m)	N/A	N/A	12 (3.6)	12 (3.6)	O & P Manual, 4-302 B
Right of Way Width, Ft (m)	10 (3.3)	N/A	15 (4.7)	15 (4.7)	From edge of proposed curb to proposed ROW
Sidewalk Width, Ft (m)	5 (1.5)	5 (1.5)	5 (1.5)	5 (1.5)	ADA Standards
Clear Zone Width, Ft (m)	1.5 (0.5)	1.5 (0.5)	1.5 (0.5)	1.5 (0.5)	O & P Manual, Fig. 4-21
Turning Radii, Ft (m)	75 (23)	75 (23)	50 (15)	50 (15)	O & P Manual, 4-710 D
Transition Length, Ft (m) R1, Ft (m) R2, Ft (m)	125 (38)	125 (38)	N/A	N/A	O & P Manual, 4-710 D, AASHTO
Storage Requirements, Ft (m)	L- 175 (53)	L-250 (76)	R- 100(30)	N/A	Computed results of analysis.
Actual Storage, Ft (m)	L- 280 (86) R- 200 (61)	L-450(142) R- 200 (61)	N/A)	N/A	Within standards from O & P Manual, 4-710 D, AASHTO

BOYINGTON / DOOLEY

IMPROVEMENTS ARE COMPLETE

Existing Conditions

Analysis of the Midway Road intersection with Boyington Drive and Dooley Drive shows operations at LOS "F" for the AM and PM peak hours. The intersection is stop sign controlled for the eastbound and westbound approaches. The northbound and southbound traffic is heavy enough to prevent adequate gaps in the traffic for the eastbound and westbound traffic to travel through the intersection. The northbound and southbound approaches (Midway Road) each have an exclusive left turn lane, but again the gaps in traffic are not sufficient for all of the left turning traffic to make it through the intersection in a reasonable amount of time. The eastbound approach has an exclusive right turn lane. Boyington and Dooley Drives both have two-lane cross-sections outside of the intersection. Midway Road has a six-lane cross section. Existing peak hour traffic counts are shown in Figure 9.

Proposed CMAQ Improvements

The proposed CMAQ improvements are to signalize the intersection and to provide an exclusive right turn lane for the eastbound approach and an exclusive left turn lane for the westbound approach. These improvements would involve some widening of the turning radii, but the roadway widths will support an additional lane with new pavement markings and channelization markings. The AM peak hour LOS would be "A" and the PM peak hour operations would be LOS "B" with these improvements. Due to another improvement project in the area, the signal is scheduled to be in place before the CMAQ project is scheduled. Therefore, the cost of the signal improvement is not included in the intersection costs. Recommended storage lengths are listed in Table 20. Table 21 shows the design criteria used for the geometric design of this intersection.

CHECK OUR PLANS & SIGN PHASING.

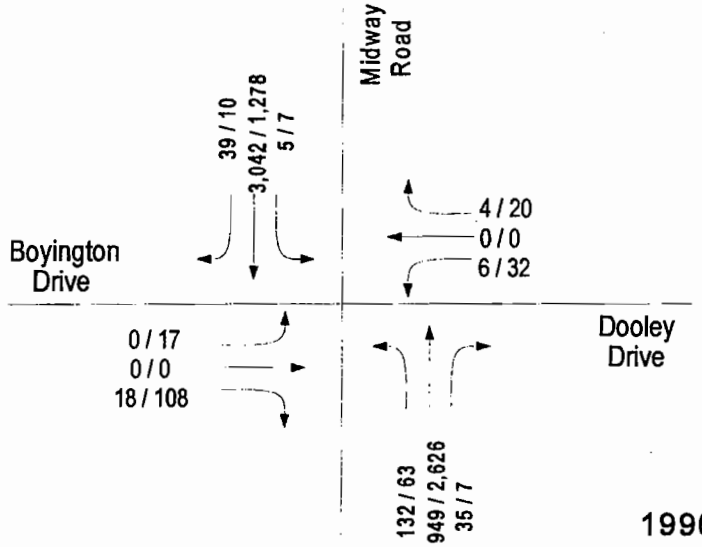


Figure 9
1996 Peak Hour Traffic for Midway Road @ Boyington/Dooley

Table 20
Geometrics and Storage Lengths for Boyington/Dooley at Midway Road

Approach	Move-ment	Existing			Proposed CMAQ Improvements		
		# of Lanes	Storage Length (ft)	Storage Length (m)	# of Lanes	Storage Length (ft)	Storage Length (m)
Eastbound	Left	0.25	N/A	N/A	0.5	N/A	N/A
	Through	0.50			0.5		
	Right	0.25	N/A	N/A	1	200	61
Westbound	Left	0.25	N/A	N/A	1	100	30
	Through	0.5			0.5		
	Right	0.25	N/A	N/A	0.5	N/A	N/A
Northbound	Left	1	100	30	1	150	46
	Through	2.5			2.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A
Southbound	Left	1	100	30	1	100	30
	Through	2.5			2.5		
	Right	0.5	N/A	N/A	0.5	N/A	N/A

Table 21
Geometric Design Criteria for Boyington/Dooley at Midway Road

Item	Measurements				Comments
	Northbound	Southbound	Eastbound	Westbound	
Posted Speed, MPH (KPH)	40 (65)	40 (65)	30 (50)	30 (50)	Posted speed limit
Design Vehicle	WB-62	WB-62	WB-50	WB-50	O & P Manual, 4-710 D
Width of Travel Lanes, Ft (m)	N/A	N/A	12 (3.6)	12 (3.6)	O & P Manual, Fig. 4-26
Width of Right Turn Lane, Ft (m)	N/A	N/A	11 (3.3)	N/A	
Width of Left Turn Lane, Ft (m)	N/A	N/A	N/A	12 (3.6)	
Offset to Face of Curb, Ft (m)	2 (0.6)	N/A	2 (0.6)	2 (0.6)	O & P Manual, Fig. 4-26
Median Width, Ft (m)	N/A	N/A	N/A	N/A	O & P Manual, 4-302 B
Right of Way Width, Ft (m)	varies	N/A	N/A	varies	From edge of proposed curb to proposed ROW
Sidewalk Width, Ft (m)	N/A	N/A	N/A	N/A	ADA Standards
Clear Zone Width, Ft (m)	1.5 (0.5)	N/A	1.5 (0.5)	1.5 (0.5)	O & P Manual, Fig. 4-21
Turning Radii, Ft (m)	75 (23)	N/A	50 (15)	50 (15)	O & P Manual, 4-710 D
Transition Length, Ft (m) R1, Ft (m) R2, Ft (m)	N/A	N/A	N/A	N/A	O & P Manual, 4-710 D, AASHTO
Storage Requirements, Ft (m)	L- 150 (46)	N/A	R- 200 (61)	L- 100 (30)	Computed results of analysis.
Actual Storage, Ft (m)	L- 100 (30) R- N/A	N/A	L- N/A R- 200 (61)	L- 85(26) R- N/A	Within standards from O & P Manual, 4-710 D, AASHTO

CONCLUSIONS

Traffic operations analyses were performed for each of the nine Midway Road intersections to provide optimum operations for the cost of improvements to each intersection. All intersections will meet the minimum level of service "D" standards for the AM and PM peak hour with the recommended improvements, as shown in Table 22 on the following pages.

A summary of the estimated costs for each intersection is shown in Table 23. This table shows that the estimated costs for improvement will exceed the budget for the Midway Road intersections at Trinity Mills Road, Keller Springs Road, McEwen Road, Proton Road, and Belmeade/Sojourn. The estimated costs for the other four intersections come in under their respective budgets. The listing of design elements and estimated costs included for each intersection are given in Appendix C and the design elements are shown on the schematic design drawings.

All nine intersections within the Midway Road corridor will meet or exceed the minimum design standards from the TxDOT Operations and Procedures Manual and the AASHTO standards from the 1994 edition of design standards. Wherever possible, the recommended standards were used.

Table 22
Summary of Intersection Geometrics for Midway Road CMAQ Projects

		Existing								Proposed CMAQ Improvements						Final Recommended Improvements						
		Geometrics		Storage	Storage	Peak Hour		Approach		Geometrics		Storage	Storage	Approach		Geometrics		Storage	Storage	Approach		
			# of	Length	Length	Traffic Volumes		LOS	Intersection		# of	Length	Length	LOS	Intersection		# of	Length	Length	LOS	Intersection	
Intersection	Approach	Movement	Lanes	(Feet)	(Meters)	AM	PM	(AM/PM)	LOS	Movement	Lanes	(Feet)	(Meters)	(AM/PM)	LOS	Movement	Lanes	(Feet)	(Meters)	(AM/PM)	LOS	Comments
Trinity Mills Road / Carrollton / Dallas	Eastbound	Left	1	350	107	162	331			Left	2	250	76			Left						There are currently 3 full lanes at the westbound approach. The inside lane becomes a left turn only lane. Therefore, the storage length needed for this westbound left turn may be overstated.
		Through	2			1,370	1,227	F/F	AM Peak	Through	3			D/C	AM Peak	Through						
		Right	1	200	61	445	139		LOS F,	Right	1	225	69		LOS D,	Right						
	Westbound	Left	1	N/A	N/A	295	205		Delay = N/A,	Left	2	250	76		Delay = 36.4	Left						
		Through	1.5			646	1,505	F/F	v/c = 1.01	Through	2			D/D	sec/veh,	Through						
		Right	0.5	N/A	N/A	37	257			Right	1	400	122		v/c = 0.93	Right						
	Northbound	Left	1	100	30	139	376			Left	2	300	91			Left						
		Through	3			347	1,764	F/F	PM Peak	Through	3			D/D	PM Peak	Through						
		Right	1	80	24	117	97		LOS F,	Right	1	150	46		LOS D,	Right						
	Southbound	Left	1	125	38	288	127		Delay = N/A,	Left	2	200	61		Delay = 32.4	Left						
		Through	2.5			2,122	577	F/F	v/c = 1.13	Through	3			D/D	sec/veh,	Through						
		Right	0.5	N/A	N/A	149	217			Right	1	200	61		v/c = 0.94	Right						
Spring Valley Road / Addison / Farmers Branch	Eastbound	Left	1	200	61	287	165			Left	2	150	46			Left						Midway Road is currently under design for widening to an eight lane cross-section between LBJ Freeway and Spring Valley Road. The widening has been accounted for with the improved conditions. This intersection would still operate at LOS D with the CMAQ improvements with or without the widening.
		Through	2.5			937	625	E/F	AM Peak	Through	3			D/D	AM Peak	Through						
		Right	0.5	N/A	N/A	342	160		LOS E,	Right	1	200	61		LOS D,	Right						
	Westbound	Left	1	115	35	319	369		Delay = 49.2	Left	2	250	76		Delay = 26.4	Left						
		Through	2.5			482	1,240	E/F	sec/veh,	Through	3			D/D	sec/veh,	Through						
		Right	0.5	N/A	N/A	329	247		v/c = 1.02	Right	1	250	76		v/c = 0.85	Right						
	Northbound	Left	1	160	49	174	418			Left	2	225	69			Left						
		Through	3			1,468	1,646	E/F	PM Peak	Through	3			D/D	PM Peak	Through						
		Right	1	110	34	361	311		LOS F,	Right	1	N/A	N/A		LOS D,	Right						
	Southbound	Left	1	200	61	259	350		Delay = 86.1	Left	2	225	69		Delay = 30.8	Left						
		Through	3			1,798	1,584	E/F	sec/veh,	Through	3.5			C/D	sec/veh,	Through						
		Right	1	N/A	N/A	115	357		v/c = 1.08	Right	0.5	N/A	N/A		v/c = 0.93	Right						
Keller Springs / Addison / Carrollton	Eastbound	Left	1	150	46	347	419			Left	2	150	46			Left	2	150	46			Although the physical capacity increases with the proposed improvements, the dual lefts prohibit the permissive left turn during the green phase for the through movements. For the eastbound approach, the final recommendations are a result of the heavy right turning volumes and light through movement volumes.
		Through	1			55	44	F/D	AM Peak	Through	2			F/D	AM Peak	Through	1			D/D	AM Peak	
		Right	1	N/A	N/A	840	228		LOS E,	Right	1	300	91		LOS F,	Right	2	100	30		LOS D,	
	Westbound	Left	1	50	15	17	71		Delay = 50.0	Left	1	50	15		Delay = 60.5	Left	1	100	30		Delay = 26.6	
		Through	0.5			6	66	D/D	sec/veh,	Through	0.5			E/D	sec/veh,	Through	0.5			D/D	sec/veh,	
		Right	0.5	N/A	N/A	6	50		v/c = 1.01	Right	0.5	N/A	N/A		v/c = 1.11	Right	0.5	N/A	N/A		v/c = 0.96	
	Northbound	Left	1	210	64	129	451			Left	2	200	61			Left	2	200	61			
		Through	3			653	2,046	D/D	PM Peak	Through	3			D/C	PM Peak	Through	3			C/C	PM Peak	
		Right	1	50	15	29	22		LOS D,	Right	1	200	61		LOS C,	Right	1	200	61		LOS C,	
	Southbound	Left	1	150	46	20	28		Delay = 25.9	Left	2	200	61		Delay = 22.4	Left	2	150	46		Delay = 22.3	
		Through	3			2,089	848	E/C	sec/veh,	Through	3			F/C	sec/veh,	Through	3			C/C	sec/veh,	
		Right	1	50	15	160	402		v/c = 0.94	Right	1	200	61		v/c = 0.82	Right	1	250	76		v/c = 0.77	

Table 22 (Cont'd.)
Summary of Intersection Geometrics for Midway Road CMAQ Projects

		Existing								Proposed CMAQ Improvements						Final Recommended Improvements						
		Geometrics		Storage	Storage	Peak Hour		Approach		Geometrics		Storage	Storage	Approach		Geometrics		Storage	Storage	Approach		
			# of	Length	Length	Traffic Volumes		LOS	Intersection		# of	Length	Length	LOS	Intersection		# of	Length	Length	LOS	Intersection	
Intersection	Approach	Movement	Lanes	(Feet)	(Meters)	AM	PM	(AM/PM)	LOS	Movement	Lanes	(Feet)	(Meters)	(AM/PM)	LOS	Movement	Lanes	(Feet)	(Meters)	(AM/PM)	LOS	Comments
Beltway Drive / Addison	Eastbound	Left	1	75	23	129	68	E/D	AM Peak LOS D, Delay = 37.4 sec/veh, v/c = 1.00	Left	1	150	46	E/D	AM Peak LOS D, Delay = 35.9 sec/veh, v/c = 0.96	Left						
		Through	1			108	138			Through	1					Through						
		Right	1	75	23	316	164			Right	1	150	46			Right						
	Westbound	Left	1	125	38	330	135	E/C		Left	1	150	46	E/C		Left						
		Through	0.5			71	145			Through	0.5					Through						
		Right	0.5	N/A	N/A	14	44			Right	0.5	N/A	N/A			Right						
	Northbound	Left	1	115	35	103	269	C/B	PM Peak LOS C, Delay = 18.2 sec/veh, v/c = 0.85	Left	1	150	46	C/B	PM Peak LOS C, Delay = 18.2 sec/veh, v/c = 0.85	Left						
		Through	3			1,249	1,970			Through	3					Through						
		Right	1	75	23	83	283			Right	1	150	46			Right						
	Southbound	Left	1	100	30	27	68	D/C		Left	1	100	30	D/C		Left						
		Through	3			2,465	1,495			Through	3					Through						
		Right	1	100	30	14	58			Right	1	100	30			Right						
Lindberg Drive / Addison	Eastbound	Left	0.5	N/A	N/A	21	72	D/F	AM Peak LOS D, Delay = 26.7 sec/veh, v/c = 0.93	Left	1	N/A	N/A	D/F	AM Peak LOS C, Delay = 20.3 sec/veh, v/c = 0.88	Left	1	100	30	C/D	AM Peak LOS C, Delay = 19.5 sec/veh, v/c = 0.77	
		Through	0.5			92	169			Through	0.5					Through	1					
		Right	1	N/A	N/A	39	72			Right	0.5	N/A	N/A			Right	1	N/A	N/A			
	Westbound	Left	0.5	N/A	N/A	110	149			Left	1	125	38	B/E		Left	1	100	30	B/D		
		Through	0.5			125	110			Through	1					Through	1					
		Right	1	125	38	309	453			Right	1	125	38			Right	1	150	46			
	Northbound	Left	1	160	49	87	56			Left	1	160	49			Left	1	160	49			
		Through	2.5			1,019	1,980	D/F	PM Peak LOS F, Delay = 70.4 sec/veh, v/c = 1.12	Through	2.5			C/D	PM Peak LOS D, Delay = 35.7 sec/veh, v/c = 0.91	Through	2.5			C/C	PM Peak LOS C, Delay = 23.5 sec/veh, v/c = 0.90	
		Right	0.5	N/A	N/A	138	191			Right	0.5	N/A	N/A			Right	0.5	N/A	N/A			
	Southbound	Left	1	200	61	479	431	D/E		Left	1	200	61			Left	1	200	61			
		Through	2.5			2,168	1,288			Through	2.5					Through	2.5					
		Right	0.5	N/A	N/A	33	40			Right	0.5	N/A	N/A			Right	0.5	N/A	N/A			
McEwen Road / Farmers Branch	Eastbound	Left	1	N/A	N/A	62	179	D/D	AM Peak LOS D, Delay = 26.6 sec/veh, v/c = 0.91	Left	0.5	N/A	N/A	C/C	AM Peak LOS C, Delay = 23.5 sec/veh, v/c = 0.81	Left						
		Through	0.5			135	73			Through	1.5					Through						
		Right	0.5	N/A	N/A	50	241			Right	1	100	30			Right						
	Westbound	Left	1	N/A	N/A	39	184	C/D		Left	1	100	30	C/C		Left						
		Through	0.5			95	126			Through	1.5					Through						
		Right	0.5	N/A	N/A	13	93			Right	0.5	N/A	N/A			Right						
	Northbound	Left	1	125	38	353	154			Left	1	200	61			Left						
		Through	2.5			2,027	1,616	D/D	PM Peak LOS D, Delay = 28.5 sec/veh, v/c = 0.96	Through	2.5			C/C	PM Peak LOS C, Delay = 20.8 sec/veh, v/c = 0.78	Through						
		Right	0.5	N/A	N/A	77	44			Right	0.5	N/A	N/A			Right						
	Southbound	Left	1	100	30	134	28			Left	1	100	30			Left						
		Through	2.5			1,637	1,929	D/D		Through	2.5			C/C		Through						
		Right	0.5	N/A	N/A	49	24			Right	0.5	N/A	N/A			Right						

Table 22 (Cont'd.)
Summary of Intersection Geometrics for Midway Road CMAQ Projects

		Existing								Proposed CMAQ Improvements						Final Recommended Improvements						
		Geometrics		Storage	Storage	Peak Hour		Approach		Geometrics		Storage	Storage	Approach		Geometrics		Storage	Storage	Approach		
Intersection	Approach	Movement	# of Lanes	Length (Feet)	Length (Meters)	Traffic Volumes AM	PM	LOS (AM/PM)	Intersection LOS	Movement	# of Lanes	Length (Feet)	Length (Meters)	LOS (AM/PM)	Intersection LOS	Movement	# of Lanes	Length (Feet)	Length (Meters)	LOS (AM/PM)	Intersection LOS	Comments
?	Eastbound	Left	0.5	N/A	N/A	90	107			Left	0.5	N/A	N/A			Left	0.5	N/A	N/A			Existing east/west phase has all movements running concurrently. Phasing changes were assumed for all alternatives. The Final Recommendation shows the results of maintaining the existing number of lanes with WB approach restriping, increasing the storage lengths, & signal timing and phasing changes.
		Through	0.5			161	26	C/F	AM Peak	Through	0.5			C/C	AM Peak	Through	0.5			C/C	AM Peak	
		Right	1	80	24	240	77		LOS C,	Right	2	100	30		LOS C,	Right	1	100	30		LOS C,	
		Left	0.5	N/A	N/A	16	63		Delay = 19.6	Left	1	N/A	N/A		Delay = 17.1	Left	0.5	N/A	N/A		Delay = 18.2	
Proton Drive	Westbound	Through	1			21	171	C/C	sec/veh,	Through	0.5			C/E	sec/veh,	Through	0.5			C/C	sec/veh,	
		Right	0.5	N/A	N/A	43	308		v/c = 0.77	Right	0.5	N/A	N/A		v/c = 0.77	Right	1	N/A	N/A		v/c = 0.75	
		Left	1	85	26	43	126			Left	1	150	46			Left	1	175	53			
Addison / Farmers Branch	Northbound	Through	2.5			1,299	2,105	C/D	PM Peak	Through	2.5			C/C	PM Peak	Through	2.5			C/C	PM Peak	
		Right	0.5	N/A	N/A	14	23		LOS D,	Right	0.5	N/A	N/A		LOS D,	Right	0.5	N/A	N/A		LOS C,	
		Left	1	100	30	272	86		Delay = 31.8	Left	1	200	61		Delay = 29.8	Left	1	250	76		Delay = 22.3	
	Southbound	Through	2.5			2,272	1,692	C/D	sec/veh,	Through	2.5			C/D	sec/veh,	Through	2.5			C/C	sec/veh,	
		Right	0.5	N/A	N/A	66	93		v/c = 1.01	Right	0.5	N/A	N/A		v/c = 0.90	Right	0.5	N/A	N/A		v/c = 0.75	
		Left	1	N/A	N/A	93	100			Left	1	N/A	N/A			Left	1	150	46			
	Eastbound	Through	0.5			383	124	F/F	AM Peak	Through	1			F/D	AM Peak	Through	1.5			D/D	AM Peak	
		Right	0.5	N/A	N/A	106	26		LOS E,	Right	1	100	30		LOS D,	Right	0.5	N/A	N/A		LOS D,	
		Left	1	N/A	N/A	179	194		Delay = 58.5	Left	1	N/A	N/A		Delay = 37.7	Left	1	250	76		Delay = 28.8	
Belmeade/ Sojourn	Westbound	Through	0.5			83	399	F/F	sec/veh,	Through	1			F/D	sec/veh,	Through	1.5			D/D	sec/veh,	
		Right	0.5	N/A	N/A	46	181		v/c = 1.18	Right	1	100	30		v/c = 0.99	Right	0.5	N/A	N/A		v/c = 0.91	
		Left	1	100	30	22	192			Left	1	100	30			Left	1	150	46			
Carrollton	Northbound	Through	2.5			445	2,096	D/D	PM Peak	Through	3			C/D	PM Peak	Through	3			C/D	PM Peak	
		Right	0.5	N/A	N/A	153	144		LOS E,	Right	1	100	30		LOS D,	Right	1	225	69		LOS D,	
		Left	1	100	30	299	143		Delay = 46.3	Left	1	100	30		Delay = 27.3	Left	1	300	91		Delay = 25.9	
	Southbound	Through	2.5			2,504	557	E/D	sec/veh,	Through	2.5			D/C	sec/veh,	Through	2.5			D/C	sec/veh,	
		Right	0.5	N/A	N/A	20	96		v/c = 1.05	Right	0.5	N/A	N/A		v/c = 0.91	Right	0.5	N/A	N/A		v/c = 0.89	
		Left	0.25	N/A	N/A	-	17			Left	0.5	N/A	N/A			Left						Proposed improvements include adding a signal. The intersection is currently controlled by stop signs on the Boyington and Dooley approaches.
	Eastbound	Through	0.5			-	-	F/F	AM Peak	Through	0.5			C/B	AM Peak	Through						
		Right	0.25	N/A	N/A	18	108		LOS F,	Right	1	200	61		LOS A,	Right						
		Left	0.25	N/A	N/A	6	32		Delay > 15	Left	1	100	30		Delay = 3.7	Left						
Boyington/ Dooley	Westbound	Through	0.5			-	-	F/F	min/veh,	Through	0.5			C/C	sec/veh,	Through						
		Right	0.25	N/A	N/A	4	20		v/c > 1.0	Right	0.5	N/A	N/A		v/c = 0.78	Right						
		Left	1	100	30	132	63			Left	1	150	46			Left						
Addison / Carrollton	Northbound	Through	2.5			949	2,626	F/F	PM Peak	Through	2.5			A/B	PM Peak	Through						
		Right	0.5	N/A	N/A	35	7		LOS F,	Right	0.5	N/A	N/A		LOS B,	Right						
		Left	1	100	30	5	7		Delay > 15	Left	1	100	30		Delay = 11.6	Left						
	Southbound	Through	2.5			3,042	1,278	F/F	min/veh,	Through	2.5			A/B	sec/veh,	Through						
		Right	0.5	N/A	N/A	39	10		v/c > 1.0	Right	0.5	N/A	N/A		v/c = 0.69	Right						

Trucks?

Table 23
Breakdown of Cost Estimate and Project Budget

	Budget Amount	PS&E	ROW	*2.17% Off 0.0% On TxDOT Constr.	2.40% County Admin. TIP	8.52% Off 0.0% On TXDOT Constr.	5.5% Off 0.0% On TxDOT ROW	Amount Available for Constr./ Admin.	Schematic Constr. Cost Estimate	9.77% Off 0.0% On TxDOT Constr./ Admin.	Constr. Amount + / -
Trinity Mills at Midway	$ 750,000	$ 111,787	$ 248,184	$ 12,129	$ 18,000	$ -	$ -	$ 359,900	$ 558,937	$ 54,608	$ (253,645)
Spring Valley at Midway	$ 1,750,000	$ 88,679	$ 156,060	$ 9,622	$ 42,000	$ -	$ -	$ 1,453,640	$ 443,394	$ 43,320	$ 966,926
Keller Springs at Midway	$ 530,000	$ 58,573	$ 156,060	$ 6,355	$ 12,720	$ -	$ -	$ 296,292	$ 292,865	$ 28,613	$ (25,186)
Beltway at Midway	$ 55,000	$ 5,957	$ 12,204	$ 646	$ 1,320	$ -	$ -	$ 34,873	$ 29,785	$ 2,910	$ 2,178
Lindberg at Midway	$ 105,000	$ 11,716	$ 13,932	$ 1,271	$ 2,520	$ -	$ -	$ 75,560	$ 58,582	$ 5,723	$ 11,255
McEwen at Midway	$ 115,000	$ 18,863	$ 27,000	$ 2,047	$ 2,760	$ -	$ -	$ 64,330	$ 94,316	$ 9,215	$ (39,201)
Proton at Midway	$ 115,000	$ 20,678	$ 33,372	$ 2,244	$ 2,760	$ -	$ -	$ 55,946	$ 103,391	$ 10,101	$ (57,546)
Belmeade/Sojourn at Midway	$ 220,000	$ 33,578	$ 68,256	$ 3,643	$ 5,280	$ -	$ -	$ 109,243	$ 167,888	$ 16,403	$ (75,047)
Boyington/Dooley at Midway	$ 155,000	$ 11,096	$ 23,976	$ 1,204	$ 3,720	$ -	$ -	$ 115,004	$ 55,479	$ 5,420	$ 54,105
Totals:	$ 3,795,000	$ 360,927	$ 739,044	$ 39,161	$ 91,080	$ -	$ -	$ 2,564,788	$ 1,804,637	$ 176,313	$ 583,838

Note: PS & E costs are 20% of the construction cost estimate.

APPENDIX

for

Schematic Design Report

CMAQ Project No. 12

TxDOT Project No. CSJ-0918-45-344

October 27, 1997

APPENDIX A

Count Data

AM Peak Hour Count for Midway Road @ Spring Valley

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
6:30 AM	7	175	23	205	29	45	33	107	63	279	19	361	43	66	27	136	809
6:45 AM	7	285	43	335	48	53	60	161	114	298	18	430	73	114	35	222	1,148
7:00 AM	20	362	41	423	48	70	84	202	92	249	29	370	51	132	41	224	1,219
7:15 AM	28	492	60	580	66	73	81	220	68	308	17	393	56	142	78	276	1,469
7:30 AM	39	425	55	519	97	158	97	352	73	382	67	522	89	206	60	355	1,748
7:45 AM	35	441	63	539	92	131	82	305	101	390	51	542	78	239	87	404	1,790
8:00 AM	24	468	76	568	76	101	68	245	100	382	29	511	99	259	77	435	1,759
8:15 AM	17	464	65	546	64	92	72	228	87	314	27	428	76	233	63	372	1,574
Peak Totals	115	1,798	259	2,172	329	482	319	1,130	361	1,468	174	2,003	342	937	287	1,566	6,871
		T =	3.2%			T =	3.6%			T =	7.3%			T =	2.0%		Average T =
		Ped =	4			Ped =	4			Ped =	3			Ped =	7		4.2%

PM Peak Hour Count for Midway Road @ Spring Valley

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
4:30 PM	83	421	81	585	64	248	104	416	70	377	72	519	33	132	32	197	1,717
4:45 PM	80	342	69	491	76	237	89	402	88	447	113	648	45	134	43	222	1,763
5:00 PM	86	433	81	600	55	349	114	518	74	388	92	554	53	162	45	260	1,932
5:15 PM	108	428	95	631	66	288	83	437	80	410	104	594	44	170	47	261	1,923
5:30 PM	98	381	91	570	62	315	80	457	87	376	110	573	32	154	35	221	1,821
5:45 PM	65	342	83	490	64	288	92	444	70	472	112	654	31	139	38	208	1,796
6:00 PM	37	304	57	398	63	239	79	381	60	437	125	622	35	146	60	241	1,642
6:15 PM	46	221	52	319	65	195	58	318	72	368	96	536	31	130	42	203	1,376
Peak Totals	357	1,584	350	2,291	247	1,240	369	1,856	311	1,646	418	2,375	160	625	165	950	7,472
		T =	2.1%			T =	1.5%			T =	3.9%			T =	2.2%		Average T =
		Ped =	3			Ped =	3			Ped =	0			Ped =	11		2.5%

AM Peak Hour Count for Midway Road @ Keller Springs

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
6:30 AM	21	265	1	287	0	1	0	1	2	77	18	97	75	3	24	102	487
6:45 AM	25	311	3	339	0	0	1	1	4	113	16	133	153	8	46	207	680
7:00 AM	29	428	12	469	2	1	2	5	12	117	23	152	151	11	60	222	848
7:15 AM	34	586	5	625	1	0	0	1	10	130	25	165	179	18	41	238	1,029
7:30 AM	42	605	4	651	2	3	4	9	18	146	33	197	234	13	81	328	1,185
7:45 AM	39	523	4	566	1	0	3	4	2	182	36	220	219	17	98	334	1,124
8:00 AM	28	416	5	449	1	2	4	7	3	149	29	181	200	15	78	293	930
8:15 AM	51	545	7	603	2	1	6	9	6	176	31	213	187	10	90	287	1,112
Peak Totals	160	2,089	20	2,269	6	6	17	29	29	653	129	811	840	55	347	1,242	4,351
		T =	1.4%			T =	6.9%			T =	5.8%			T =	0.9%		Average T =
		Ped =	0			Ped =	0			Ped =	0			Ped =	0		2.1%

PM Peak Hour Count for Midway Road @ Keller Springs

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
4:30 PM	69	167	6	242	5	10	13	28	8	340	115	463	41	2	76	119	852
4:45 PM	74	183	5	262	11	15	17	43	5	548	137	690	52	7	59	118	1,113
5:00 PM	107	235	7	349	12	21	21	54	8	545	111	664	67	16	116	199	1,266
5:15 PM	121	229	11	361	13	20	20	53	6	480	103	589	59	8	122	189	1,192
5:30 PM	100	201	5	306	14	10	13	37	3	473	100	576	50	13	122	185	1,104
5:45 PM	104	165	5	274	5	7	9	21	8	506	120	634	58	9	94	161	1,090
6:00 PM	86	202	6	294	4	5	14	23	2	547	130	679	57	4	94	155	1,151
6:15 PM	59	156	2	217	5	2	2	9	5	443	122	570	60	1	50	111	907
Peak Totals	402	848	28	1,278	50	66	71	187	22	2,046	451	2,519	228	44	419	691	4,675
		T =	2.5%			T =	3.2%			T =	1.3%			T =	1.3%		Average T =
		Ped =	0			Ped =	0			Ped =	0			Ped =	0		1.7%

AM Peak Hour Count for Midway Road @ Beltway Road

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
6:30 AM	0	248	2	250	2	4	2	8	10	195	8	213	19	6	4	29	500
6:45 AM	4	428	5	437	1	1	12	14	7	300	10	317	30	12	12	54	822
7:00 AM	5	513	4	522	0	4	18	22	19	209	15	243	40	10	7	57	844
7:15 AM	6	565	4	575	1	2	36	39	14	221	13	248	50	11	18	79	941
7:30 AM	3	562	1	566	3	24	103	130	13	306	12	331	68	18	30	116	1,143
7:45 AM	3	593	3	599	3	30	113	146	14	335	33	382	94	39	42	175	1,302
8:00 AM	3	662	11	676	4	5	65	74	25	314	23	362	81	21	36	138	1,250
8:15 AM	5	648	12	665	4	12	49	65	31	294	35	360	73	30	21	124	1,214
Peak Totals	14	2,465	27	2,506	14	71	330	415	83	1,249	103	1,435	316	108	129	553	4,909
		T =	2.8%			T =	0.7%			T =	5.4%			T =	1.3%		Average T =
		Ped =	3			Ped =	5			Ped =	1			Ped =	3		3.2%

PM Peak Hour Count for Midway Road @ Beltway Road

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
4:30 PM	10	404	17	431	6	14	36	56	73	595	58	726	30	18	20	68	1,281
4:45 PM	9	243	9	261	6	15	17	38	37	372	43	452	21	16	12	49	800
5:00 PM	12	481	14	507	13	41	33	87	114	315	89	518	53	46	18	117	1,229
5:15 PM	13	346	18	377	11	41	39	91	47	513	48	608	31	30	17	78	1,154
5:30 PM	15	375	15	405	10	37	38	85	71	594	61	726	45	31	16	92	1,308
5:45 PM	18	293	21	332	10	26	25	61	51	548	71	670	35	31	17	83	1,146
6:00 PM	12	289	15	316	7	10	19	36	45	542	54	641	22	29	30	81	1,074
6:15 PM	12	280	6	298	4	18	19	41	44	525	61	630	18	18	14	50	1,019
Peak Totals	58	1,495	68	1,621	44	145	135	324	283	1,970	269	2,522	164	138	68	370	4,837
		T =	2.7%			T =	1.2%			T =	2.2%			T =	0.3%		Average T =
		Ped =	4			Ped =	2			Ped =	6			Ped =	1		2.2%

AM Peak Hour Count for Midway Road @ Lindberg Drive

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
6:30 AM	9	270	37	316	24	6	6	36	11	204	18	233	2	0	1	3	588
6:45 AM	10	333	59	402	47	14	14	75	28	225	30	283	4	4	2	10	770
7:00 AM	13	515	77	605	41	12	19	72	17	180	19	216	4	5	4	13	906
7:15 AM	7	579	111	697	56	29	24	109	29	221	16	266	8	8	2	18	1,090
7:30 AM	3	601	113	717	81	28	28	137	22	249	18	289	10	24	8	42	1,185
7:45 AM	7	493	129	629	92	34	30	156	44	256	33	333	7	39	8	54	1,172
8:00 AM	16	495	126	637	80	34	28	142	43	293	20	356	14	21	3	38	1,173
8:15 AM	14	423	141	578	80	30	30	140	29	262	27	318	10	26	7	43	1,079
Peak Totals	33	2,168	479	2,680	309	125	110	544	138	1,019	87	1,244	39	92	21	152	4,620
		T =	1.9%			T =	4.2%			T =	3.8%			T =	11.2%		Average T =
		Ped =	0			Ped =	0			Ped =	0			Ped =	0		3.0%

PM Peak Hour Count for Midway Road @ Lindberg Drive

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
4:30 PM	10	285	88	383	93	24	25	142	20	407	11	438	17	22	14	53	1,016
4:45 PM	12	302	73	387	96	37	19	152	28	467	13	508	15	34	13	62	1,109
5:00 PM	14	333	88	435	105	34	34	173	34	488	12	534	23	42	15	80	1,222
5:15 PM	8	299	104	411	99	25	34	158	49	546	18	613	25	42	13	80	1,262
5:30 PM	12	335	127	474	146	29	41	216	59	421	11	491	9	53	28	90	1,271
5:45 PM	6	321	112	439	103	22	40	165	49	525	15	589	15	32	16	63	1,256
6:00 PM	1	294	126	421	121	33	35	189	36	459	8	503	28	36	14	78	1,191
6:15 PM	5	242	76	323	74	13	33	120	55	469	13	537	11	15	7	33	1,013
Peak Totals	40	1,288	431	1,759	453	110	149	712	191	1,980	56	2,227	72	169	72	313	5,011
		T =	2.8%			T =	2.1%			T =	1.9%			T =	1.6%		Average T =
		Ped =	1			Ped =	0			Ped =	1			Ped =	0		2.2%

AM Peak Hour Count for Midway Road @ Proton Drive

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
6:30 AM	13	220	16	249	3	1	1	5	0	238	5	243	21	4	6	31	528
6:45 AM	8	285	26	319	2	0	0	2	0	301	11	312	31	6	10	47	680
7:00 AM	12	421	36	469	8	3	0	11	0	229	6	235	40	15	11	66	781
7:15 AM	25	583	57	665	3	1	3	7	3	281	10	294	61	28	12	101	1,067
7:30 AM	17	580	67	664	12	10	5	27	4	312	15	331	73	35	28	136	1,158
7:45 AM	15	591	87	693	11	9	5	25	6	344	10	360	54	62	21	137	1,215
8:00 AM	9	518	61	588	17	1	3	21	1	362	8	371	52	36	29	117	1,097
8:15 AM	14	515	66	595	11	1	0	12	4	343	3	350	46	27	16	89	1,046
Peak Totals	66	2,272	272	2,610	43	21	16	80	14	1,299	43	1,356	240	161	90	491	4,537
		T =	2.0%			T =	1.3%			T =	3.2%			T =	1.0%		Average T =
		Ped =	0			Ped =	2			Ped =	2			Ped =	1		2.2%

PM Peak Hour Count for Midway Road @ Proton Drive

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
4:30 PM	20	373	24	417	35	13	7	55	15	508	35	558	15	4	34	53	1,083
4:45 PM	17	333	18	368	83	35	17	135	7	567	24	598	17	6	25	48	1,149
5:00 PM	30	487	21	538	81	38	13	132	5	565	42	612	21	10	36	67	1,349
5:15 PM	27	408	27	462	89	57	12	158	5	437	25	467	16	3	22	41	1,128
5:30 PM	19	464	20	503	55	41	21	117	6	536	35	577	23	7	24	54	1,251
5:45 PM	22	387	25	434	39	34	10	83	5	466	31	502	15	3	28	46	1,065
6:00 PM	13	305	14	332	34	24	4	62	5	487	44	536	13	3	29	45	975
6:15 PM	15	298	12	325	29	4	5	38	3	415	35	453	10	0	12	22	838
Peak Totals	93	1,692	86	1,871	308	171	63	542	23	2,105	126	2,254	77	26	107	210	4,877
		T =	2.2%			T =	0.6%			T =	1.9%			T =	1.4%		Average T =
		Ped =	2			Ped =	2			Ped =	1			Ped =	3		1.8%

AM Peak Hour Count for Midway Road @ Boyington / Dooley

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
6:30 AM	3	312	3	318	0	0	0	0	6	89	27	122	3	0	0	3	443
6:45 AM	11	504	2	517	0	0	1	1	5	154	28	187	1	0	0	1	706
7:00 AM	5	512	0	517	1	0	0	1	5	157	33	195	4	0	0	4	717
7:15 AM	9	794	1	804	0	0	0	0	12	206	32	250	4	0	0	4	1,058
7:30 AM	6	814	1	821	1	0	1	2	5	243	24	272	5	0	0	5	1,100
7:45 AM	10	720	3	733	1	0	4	5	10	266	39	315	6	0	0	6	1,059
8:00 AM	14	714	0	728	2	0	1	3	8	234	37	279	3	0	0	3	1,013
8:15 AM	9	625	0	634	2	0	3	5	5	296	48	349	12	0	2	14	1,002
Peak Totals	39	3,042	5	3,086	4	0	6	10	35	949	132	1,116	18	0	0	18	4,230
		T =	1.0%			T =	0.0%			T =	4.1%			T =	11.1%		Average T =
		Ped =	0			Ped =	0			Ped =	0			Ped =	0		1.9%

PM Peak Hour Count for Midway Road @ Boyington / Dooley

Period	Southbound				Westbound				Northbound				Eastbound				Intersection
Begins	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Right	Thru	Left	Totals	Totals
4:30 PM	2	273	0	275	3	0	10	13	6	547	12	565	25	0	6	31	884
4:45 PM	7	276	3	286	4	0	5	9	3	642	16	661	36	0	5	41	997
5:00 PM	4	373	2	379	7	0	10	17	4	683	27	714	38	0	6	44	1,154
5:15 PM	2	309	4	315	7	0	10	17	3	601	12	616	18	0	6	24	972
5:30 PM	2	318	1	321	3	0	5	8	0	645	13	658	27	0	1	28	1,015
5:45 PM	2	278	0	280	3	0	7	10	0	697	11	708	25	0	4	29	1,027
6:00 PM	2	245	0	247	8	0	8	16	2	601	18	621	22	0	2	24	908
6:15 PM	3	224	0	227	2	0	7	9	1	570	4	575	15	0	3	18	829
Peak Totals	10	1,278	7	1,295	20	0	32	52	7	2,626	63	2,696	108	0	17	125	4,168
		T =	2.7%			T =	1.9%			T =	1.2%			T =	2.4%		Average T =
		Ped =	0			Ped =	0			Ped =	0			Ped =	0		1.7%

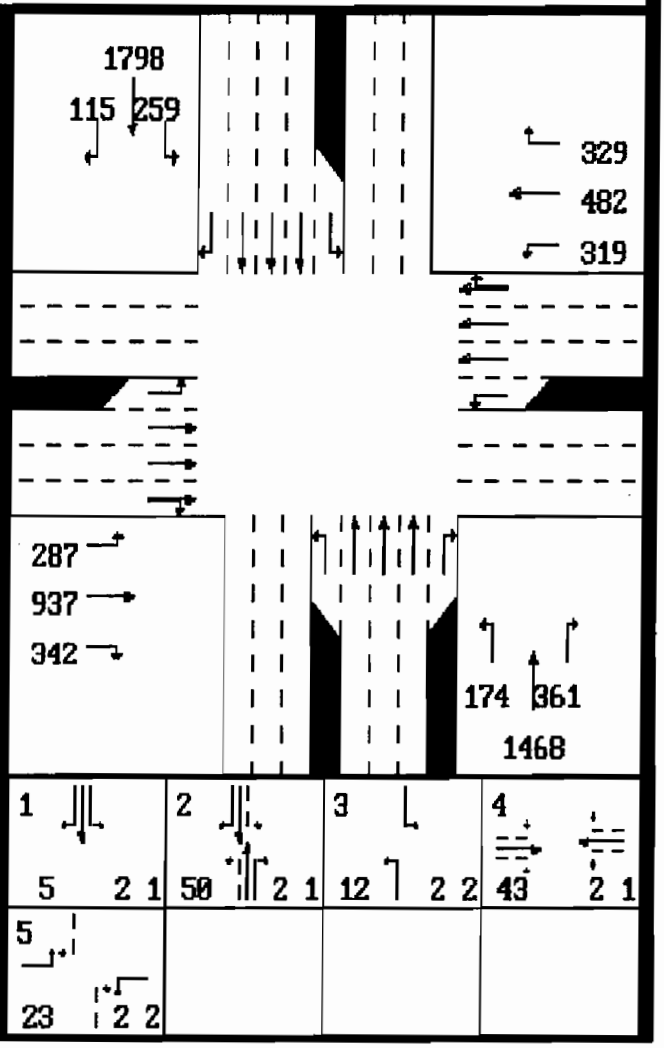
APPENDIX B

Intersection Analyses

HCM Summary Results for Case: SPVLEXAM Spring Vally/Midway Road

Existing Conditions AM Peak Version 3.06

	Lane Grp	v/s	X v/c	Delay (sec/ veh)	L O S	App Delay (sec/ veh)	L O S
EB	Lper	*0.29				56.3	E
	Lpro	0.15	0.87#	53.8	E		
	TR	0.29	1.00	56.9	E		
WB	Lper	0.29				48.0	E
	Lpro	*0.18	0.99#	79.3	F		
	TR	0.18	0.63	35.9	D		
NB	Lper	*0.34				50.1	E
	Lpro	0.08	0.97#	92.0	F		
	T	0.33	0.99	51.8	E		
	R	0.24	0.48	19.6	C		
SB	Lper	0.00				43.4	E
	Lpro	*0.15	0.92#	65.4	F		
	T	0.37	0.96	41.4	E		
	R	0.04	0.07	12.2	B		
	Int.	0.96	1.02	49.2	E	#L TOTAL	



Input Data for Case: SPVLEXAM — Spring Vally/Midway Road

Existing Conditions — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	4	4	5	5
Outbound Street	3	3	3	3

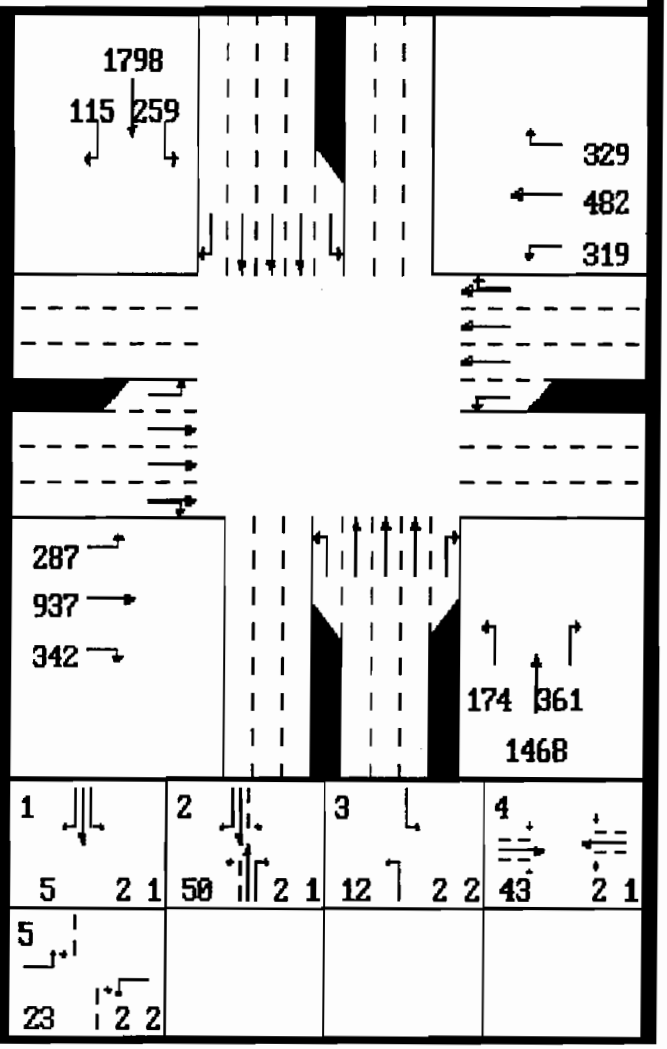
2)

	-Pkt Lanes- Left	Right	--Lane Lengths— Full L	Pkt	R Pkt
EB	1	0	1000	200	
WB	1	0	1000	115	
NB	1	1	1000	160	110
SB	1	0	1100	200	

3)Need to Revise Channelization? N

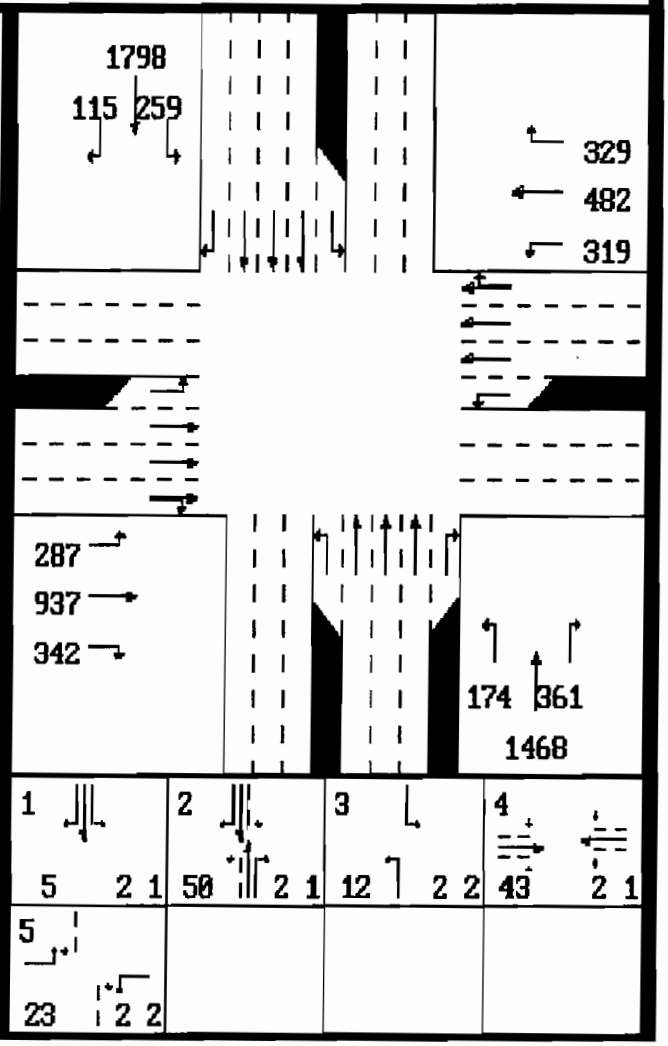
4) Lane Widths (Feet)

	Median	2	3	4	5	6
EB	12.0	12.0	12.0	12.0		
WB	12.0	12.0	12.0	12.0		
NB	12.0	12.0	12.0	12.0	12.0	
SB	12.0	12.0	12.0	12.0	12.0	



NETSIM Results for Case: SPVLEXAM — Spring Vally/Midway Road

Existing Conditions — AM Peak — Version 3.06



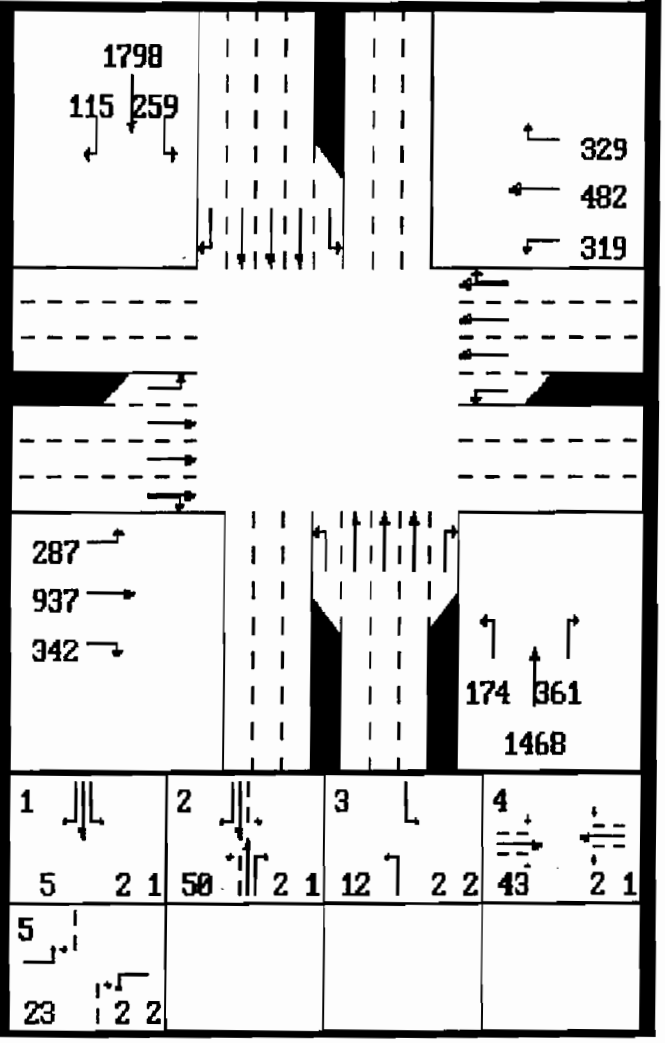
Simulation results indicate that the peak period traffic movements identified by X are oversaturated and cannot be serviced

Approach	Left	Thru	Right
EB			X
WB	X		
SB	X		

NETSIM Summary for Case: SPVLEXAM — Spring Valley/Midway Road

Existing Conditions — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	8/ 13	3.0	0.9
	TR	15/ 20	6.9	0.0
	All		6.6	0.9
WB	L	16/ 24	1.4	45.7
	TR	9/ 16	8.4	0.0
	All		7.4	45.7
NB	L	13/ 17	0.8	33.9
	T	27/ 47	4.9	0.7
	R	16/ 23	6.1	0.0
	All		4.7	33.9
SB	L	25/ 36	0.9	62.7
	T	20/ 34	6.3	0.0
	R	1/ 2	22.4	0.0
	All		5.9	62.7
Intersect.			5.8	



NETSIM Results for Case: SPVLEXAM — Spring Vally/Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	8	13	0.9	50.0	83.3	6:59
	TR	15	28	0.0			12:44
WB	L	16	24	45.7	66.7	16.7	14:37
	TR	9	16	0.0			13:37
NB	L	13	17	33.9	50.0	83.3	6:02
	T	27	47	0.7			12:39
	R	16	23	0.0	33.3	100.0	10:04
SB	L	25	36	62.7	66.7	0.0	13:27
	T	20	34	0.0			14:14
	R	1	2	0.0			1:02

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: SPVLEXAM — Spring Vally/Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	10.9	0.5	0.0	7.5	3.3	0.0
WB	6.0	0.3	0.0	9.6	6.7	0.0
NB	15.6	1.7	0.0	5.9	3.5	0.0
SB	16.4	1.1	0.0	6.7	3.0	0.0
All	48.9	3.6	0.0	7.0	3.6	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

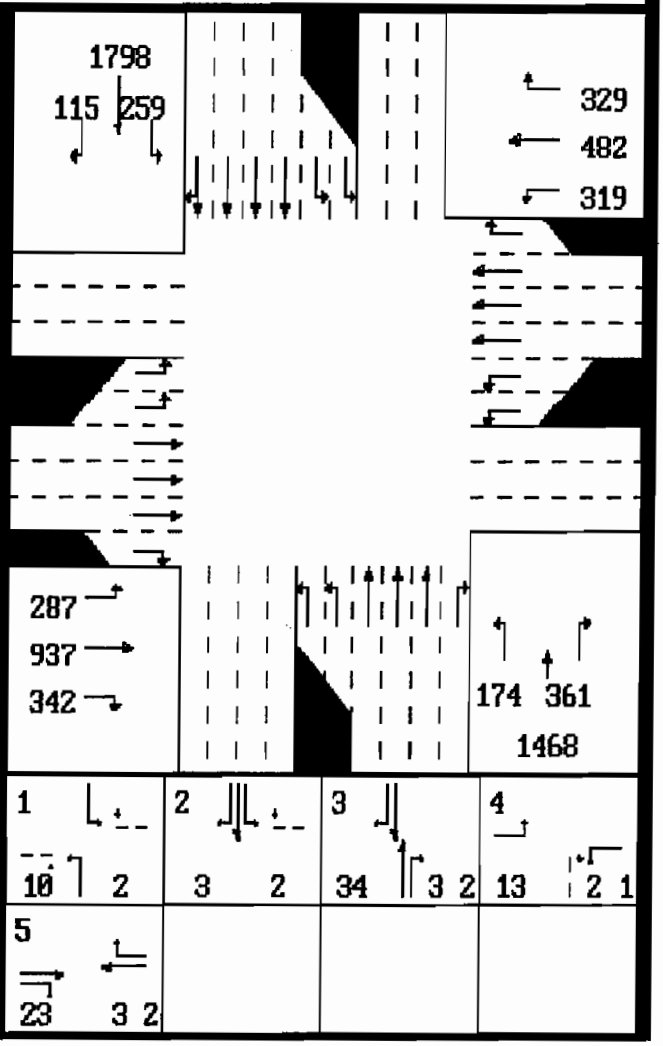
	HC	CO	NOX	RTOR Maneuvers Completed
EB	589.3	15114.8	1762.3	38
WB	303.8	5694.8	698.0	36
NB	793.2	16238.2	2126.8	25
SB	797.9	20528.2	2448.8	9
All	625.4	14543.4	1775.8	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: SPVYAM2 Spring Vally/Midway Road

Exist. Traffic w/ + Midway BL AM Peak Version 3.06

	Lane Grp	v/s	X v/c	Lane Grp - Delay (sec/ veh)	L O S	App - Delay (sec/ veh)	L O S
EB	L	0.09	0.72	34.5	D	28.3	D
	T	0.20	0.82	29.0	D		
	R	0.20	0.53	19.4	C		
WB	L	*0.11	0.82	40.0	D	27.3	D
	T	0.11	0.43	24.1	C		
	R	*0.21	0.53	18.6	C		
NB	L	0.06	0.64	36.6	D	26.6	D
	T	*0.33	0.92	28.6	D		
	R	0.23	0.45	11.7	B		
SB	L	*0.08	0.57	31.4	D	20.7	C
	TR	0.30	0.73	19.4	C		
	Int.	0.72	0.82	25.3	D		



Input Data for Case: SPVYAM2 — Spring Vally/Midway Road

Exist. Traffic w/ + Midway 8L — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	6	6	6	6
Outbound Street	3	3	3	4

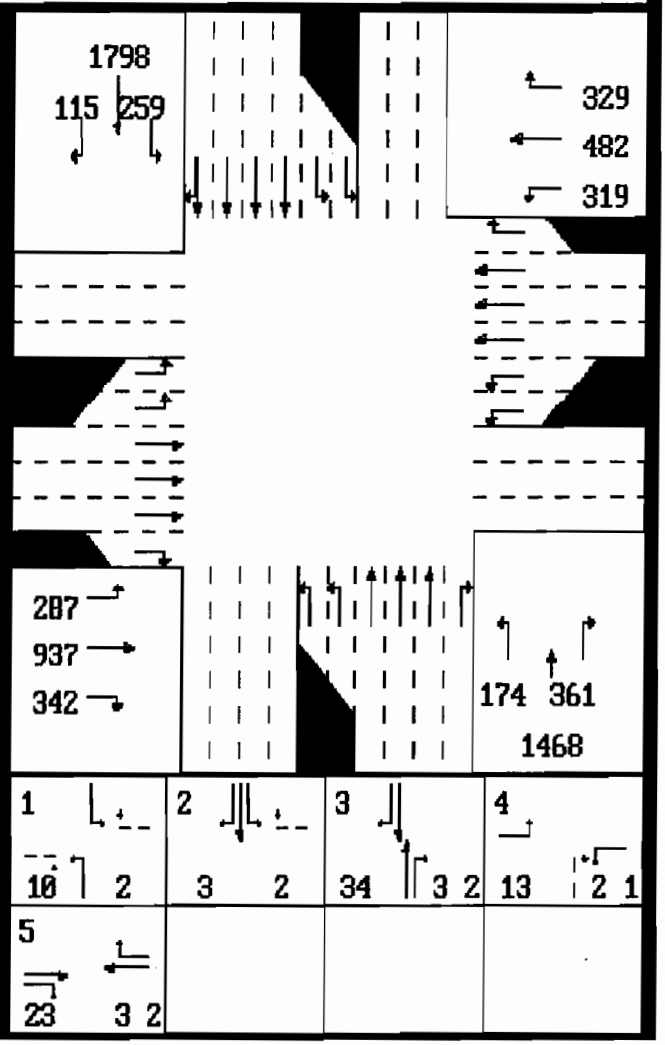
2)

	-Pkt Lanes-		—Lane Lengths—		
	Left	Right	Full L	Pkt R	Pkt
EB	2	1	1000	150	200
WB	2	1	1000	250	250
NB	2	0	1000	225	
SB	2	0	1100	225	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

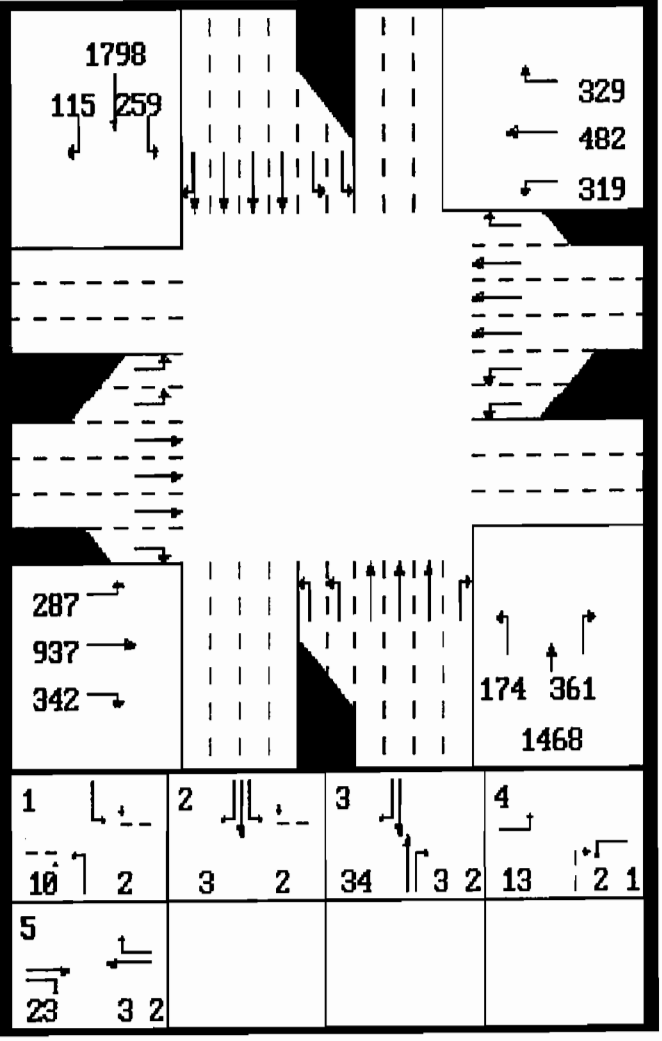
	Median	2	3	4	5	6
EB	12.0	12.0	12.0	12.0	12.0	12.0
WB	12.0	12.0	12.0	12.0	12.0	12.0
NB	12.0	12.0	12.0	12.0	12.0	12.0
SB	12.0	12.0	12.0	12.0	12.0	12.0



NETSIM Summary for Case: SPVYAM2 — Spring Vally/Midway Road

Exist. Traffic w/ + Midway BL — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	5/ 7	2.0	0.0
	T	7/ 10	11.4	0.0
	R	7/ 9	4.4	0.0
	All		9.2	0.0
WB	L	5/ 8	3.4	0.0
	T	4/ 6	15.5	0.0
	R	4/ 6	9.2	0.0
	All		11.8	0.0
NB	L	3/ 5	3.2	0.0
	T	10/ 14	12.8	0.0
	R	5/ 9	19.0	0.0
	All		12.8	0.0
SB	L	5/ 7	3.1	0.0
	TR	8/ 12	14.0	0.0
	All		12.6	0.0
Intersect.			11.6	



NETSIM Results for Case: SPVYAM2 Spring Valley/Midway Road

Exist. Traffic w/ + Midway 8L AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	5	7	0.0	0.0	0.0	3:12
	T	7	10	0.0			8:10
	R	7	9	0.0	0.0	0.0	8:12
WB	L	5	8	0.0	0.0	0.0	10:10
	T	4	6	0.0			5:12
	R	4	6	0.0	0.0	0.0	11:56
NB	L	3	5	0.0	0.0	11.1	5:50
	T	10	14	0.0			1:16
	R	5	9	0.0			11:04
SB	L	5	7	0.0	0.0	0.0	8:49
	TR	8	12	0.0			4:04

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: SPVYAM2 Spring Vally/Midway Road

Exist. Traffic w/ + Midway 8L AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	8.9	0.4	0.0	9.2	4.2	0.0
WB	4.3	0.3	0.0	13.6	7.2	0.0
NB	7.2	0.9	0.0	13.5	6.9	0.0
SB	10.3	0.8	0.0	11.0	4.7	0.0
All	30.8	2.4	0.0	11.4	5.8	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

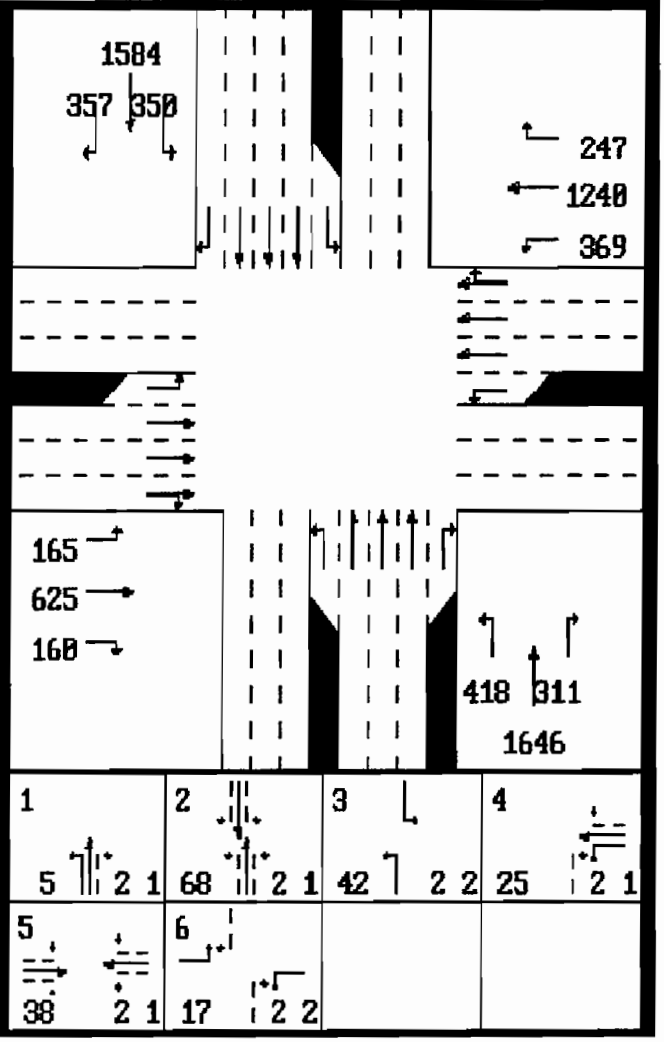
	HC	CO	NOX	RTOR Maneuvers Completed
EB	498.8	14185.1	1607.8	54
WB	225.5	5155.9	569.0	42
NB	384.1	9202.0	1020.3	32
SB	529.4	16502.3	1745.5	0
All	412.4	11389.2	1248.1	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: SPVLEXPM Spring Vally/Midway Road

Existing Conditions PM Peak Version 3.06

		- Lane Grp -			- App -	
				Delay	L	Delay	L
	Lane		X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	Lper	0.18				90.7	F
	Lpro	*0.08	0.99#	121.1	F		
	TR	0.17	0.98	84.8	F		
WB	Lper	0.00				96.6	F
	Lpro	0.23	0.99#	90.2	F		
	TR	*0.33	1.08	98.1	F		
NB	Lper	0.00				71.6	F
	Lpro	*0.26	1.03#	97.1	F		
	T	0.36	1.03	73.1	F		
	R	0.18	0.31	18.6	C		
SB	Lper	0.31				90.4	F
	Lpro	0.20	0.99#	94.2	F		
	T	*0.34	1.08	99.2	F		
	R	0.23	0.57	39.0	D		
	Int.	1.02	1.08	86.1	F	#L	TOTAL



Input Data for Case: SPVLEXPM — Spring Vally/Midway Road

Existing Conditions — PM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	4	4	5	5
Outbound Street	3	3	3	3

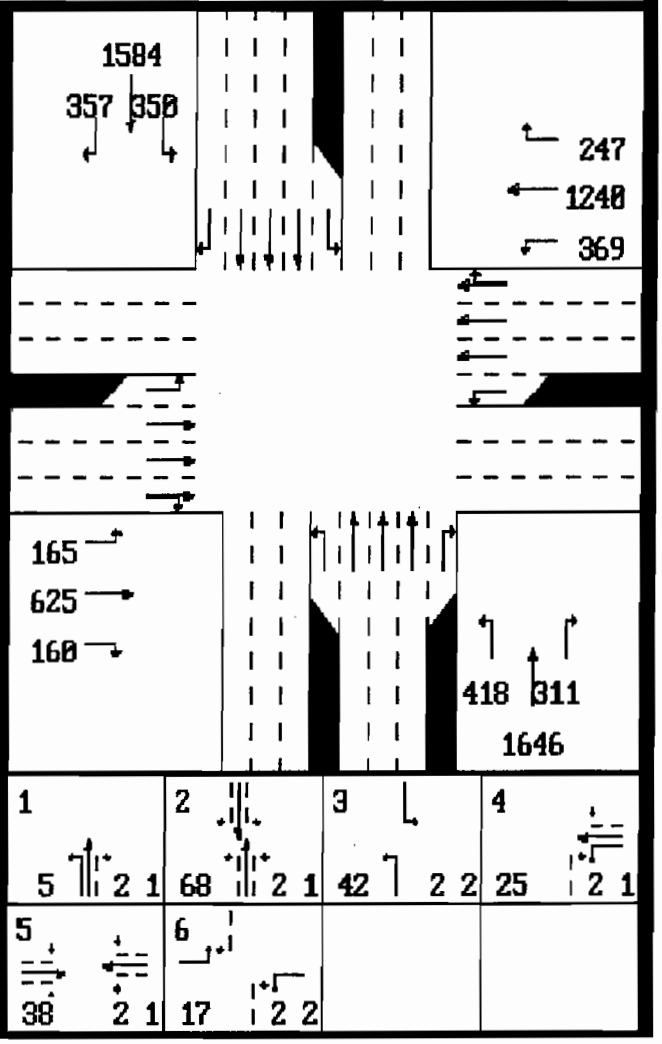
2)

	-Pkt Lanes- Left	Right	--Lane Lengths— Full L Pkt	R Pkt
EB	1	0	1000	200
WB	1	0	1000	115
NB	1	1	1000	160	110
SB	1	0	1100	200

3)Need to Revise Channelization? N

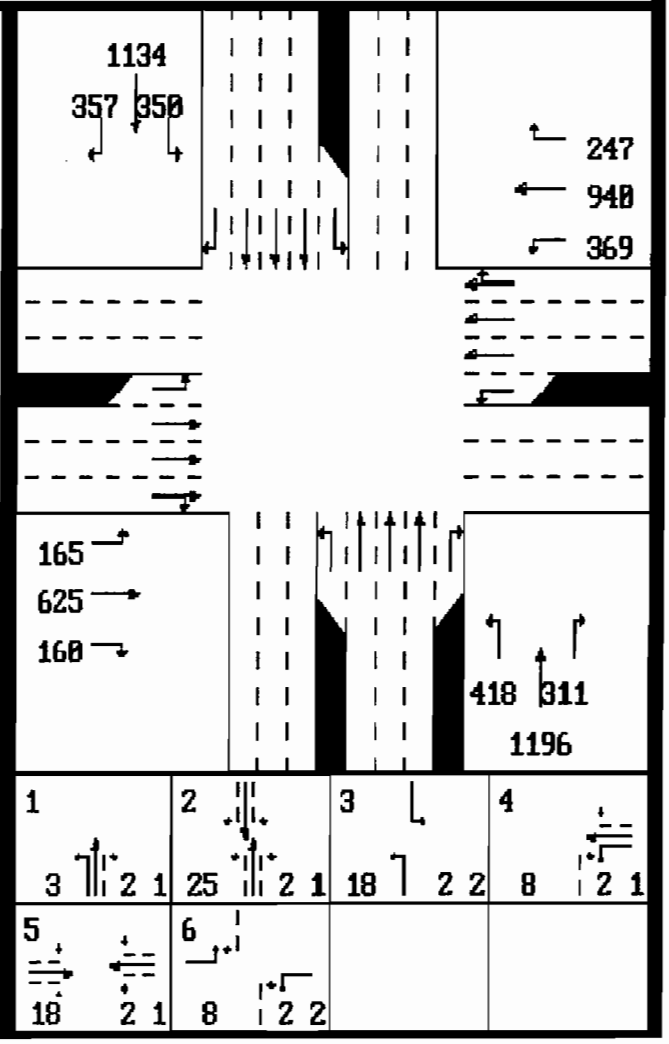
4) Lane Widths (Feet)

	Median	2	3	4	5	6
EB		12.0	12.0	12.0	12.0	
WB		12.0	12.0	12.0	12.0	
NB		12.0	12.0	12.0	12.0	12.0
SB		12.0	12.0	12.0	12.0	12.0



NETSIM Results for Case: SPVEXPM3 Spring Vally/Midway Road

Existing Conditions PM Peak Version 3.06



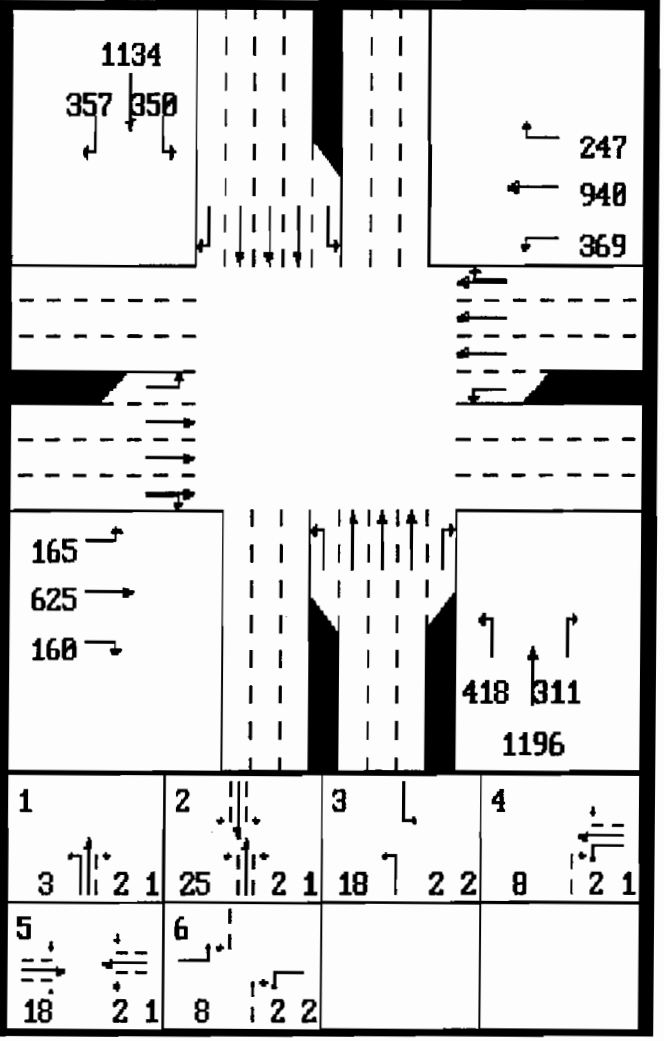
Simulation results indicate that the peak period traffic movements identified by X are oversaturated and cannot be serviced

Approach	Left	Thru	Right
WB	X	X	
NB	X		

NETSIM Summary for Case: SPVEXPM3 — Spring Vally/Midway Road

Existing Conditions — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	4/ 9	2.3	0.0
	TR	6/ 9	9.2	0.0
	All		8.2	0.0
WB	L	24/ 40	1.1	48.2
	TR	19/ 48	4.2	1.7
	All		4.0	48.2
NB	L	27/ 37	1.3	64.7
	T	7/ 13	9.0	0.0
	R	3/ 7	8.4	0.0
	All		7.9	64.7
SB	L	13/ 17	1.6	28.2
	T	9/ 12	10.3	0.0
	R	4/ 8	16.4	0.0
	All		9.4	28.2
Intersect.			6.8	



NETSIM Results for Case: SPVEXPM3 Spring Vally/Midway Road

Existing Conditions PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	4	9	0.0	0.0	0.0	8:07
	TR	6	9	0.0			10:00
WB	L	24	40	48.2	77.8	22.2	12:42
	TR	19	48	1.7			14:22
NB	L	27	37	64.7	88.9	0.0	13:50
	T	7	13	0.0			11:47
	R	3	7	0.0	11.1	44.4	10:36
SB	L	13	17	28.2	55.6	0.0	9:31
	T	9	12	0.0			11:01
	R	4	8	0.0			9:24

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: SPVEXPM3 Spring Vally/Midway Road

Existing Conditions PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	5.7	0.4	0.0	8.5	3.2	0.0
WB	14.3	0.3	0.0	5.1	3.1	0.0
NB	12.1	0.7	0.0	7.9	4.9	0.0
SB	11.3	0.6	0.0	9.4	3.0	0.0
All	43.3	2.0	0.0	7.4	3.7	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

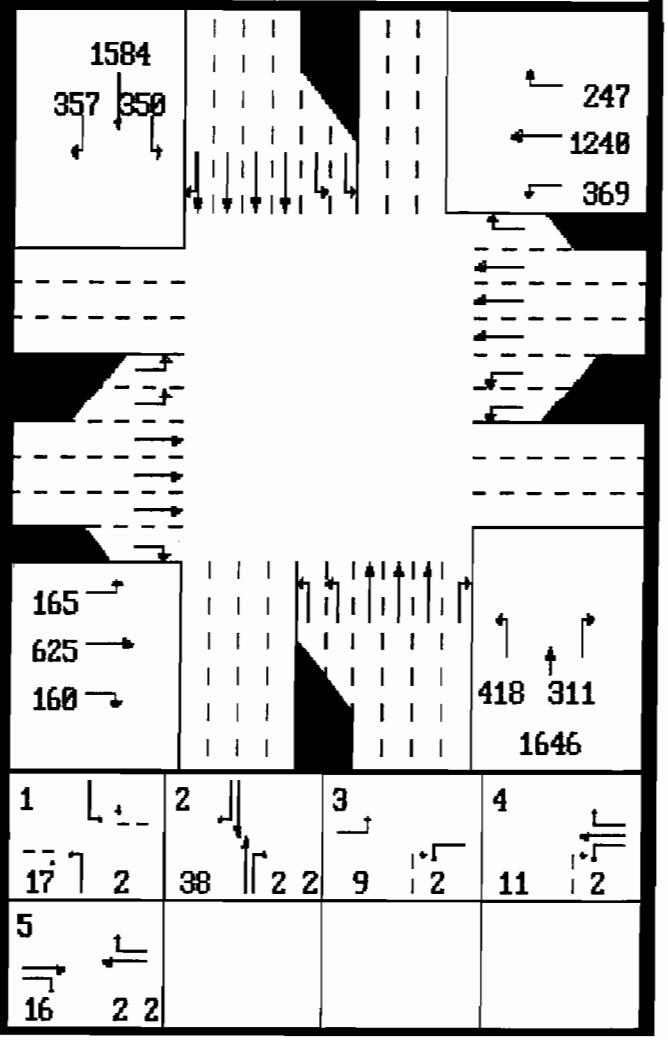
	HC	CO	NOX	RTOR Maneuvers Completed
EB	318.4	9152.9	1018.8	15
WB	727.9	15690.3	2017.8	14
NB	660.4	18246.1	2150.1	31
SB	568.6	16123.5	1793.6	55
All	568.8	14835.4	1746.3	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: SPVYPM3 Spring Vally/Midway Road

CMAQ Improvements + Midway 8L PM Peak Version 3.06

	Lane Grp	v/s	X v/c	Lane Grp Delay (sec/veh)	Lane Grp LOS	App Delay (sec/veh)	App LOS
EB	L	*0.05	0.69	40.9	E	35.4	D
	T	0.14	0.84	37.3	D		
	R	0.09	0.27	19.8	C		
WB	L	0.12	0.60	29.7	D	31.8	D
	T	*0.27	0.95	35.5	D		
	R	0.16	0.35	13.7	B		
NB	L	*0.14	0.89	40.3	E	30.6	D
	T	*0.36	0.98	31.8	D		
	R	0.22	0.38	9.5	B		
SB	L	0.11	0.74	35.9	D	27.0	D
	TR	0.32	0.86	25.5	D		
	Int.	0.82	0.93	30.4	D		



Input Data for Case: SPVYPM3 — Spring Vally/Midway Road

CMAQ Improvements + Midway 8L — PM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	6	6	6	6
Outbound Street	3	3	3	4

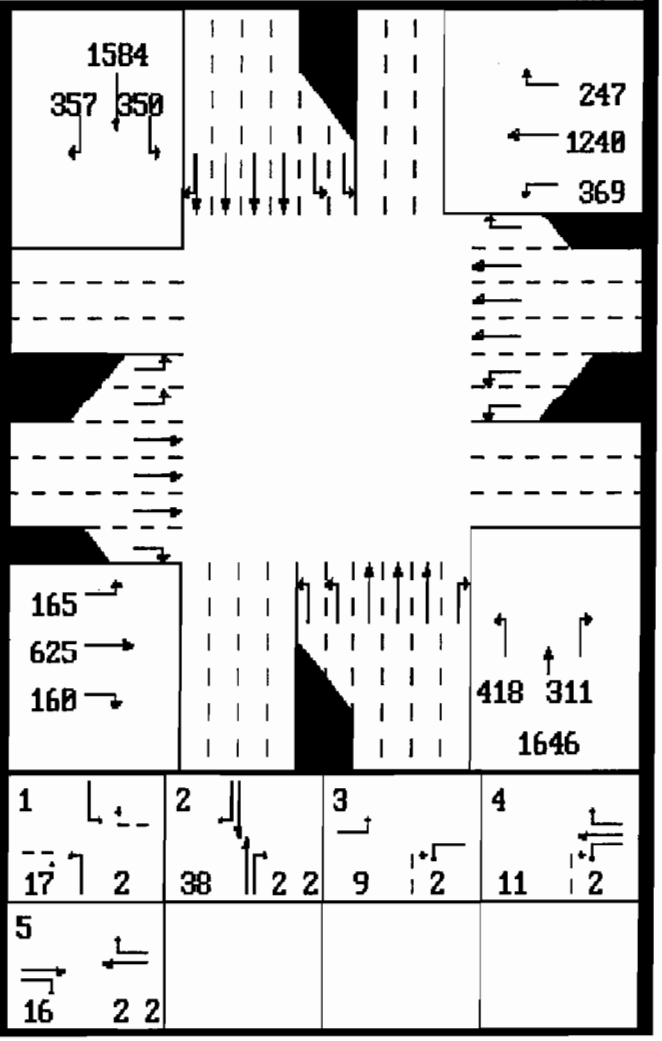
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt R	Pkt
EB	2	1	1000	150	200
WB	2	1	1000	250	250
NB	2	0	1000	225	
SB	2	0	1100	225	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

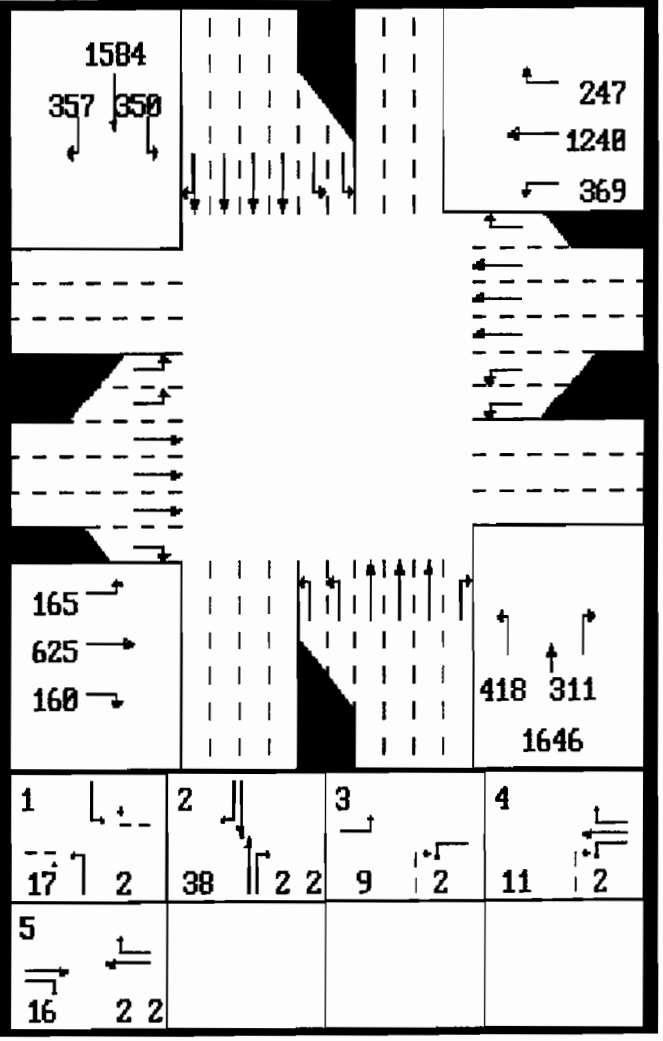
	Median	2	3	4	5	6
EB	12.0	12.0	12.0	12.0	12.0	12.0
WB	12.0	12.0	12.0	12.0	12.0	12.0
NB	12.0	12.0	12.0	12.0	12.0	12.0
SB	12.0	12.0	12.0	12.0	12.0	12.0



NETSIM Summary for Case: SPVYPM3 — Spring Vally/Midway Road

CMAQ Improvements + Midway 8L — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	4/ 6	2.8	0.0
	T	6/ 8	12.4	0.0
	R	2/ 3	13.4	0.0
	All		10.5	0.0
WB	L	6/ 9	2.6	0.0
	T	12/ 18	8.1	0.0
	R	3/ 6	7.4	0.0
	All		7.3	0.0
NB	L	8/ 9	2.5	0.0
	T	8/ 14	13.5	0.0
	R	2/ 4	20.8	0.0
	All		12.0	0.0
SB	L	6/ 7	3.3	0.0
	TR	11/ 15	13.5	0.0
	All		12.1	0.0
Intersect.			10.3	



NETSIM Results for Case: SPVYPM3 Spring Vally/Midway Road

CMAQ Improvements + Midway 8L PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	4	6	0.0	0.0	0.0	7:30
	T	6	8	0.0			7:57
	R	2	3	0.0	0.0	0.0	5:26
WB	L	6	9	0.0	0.0	37.5	5:30
	T	12	18	0.0			14:10
	R	3	6	0.0	0.0	12.5	1:53
NB	L	8	9	0.0	0.0	25.0	6:06
	T	8	14	0.0			13:58
	R	2	4	0.0			5:45
SB	L	6	7	0.0	0.0	12.5	4:39
	TR	11	15	0.0			1:16

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: SPVYPM3 Spring Vally/Midway Road

CMAQ Improvements + Midway 8L PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	3.6	0.2	0.0	13.5	5.7	0.0
WB	11.6	0.5	0.0	8.0	3.6	0.0
NB	11.5	0.9	0.0	10.3	4.8	0.0
SB	10.7	0.4	0.0	12.3	5.8	0.0
All	37.5	2.0	0.0	10.4	4.8	0.0

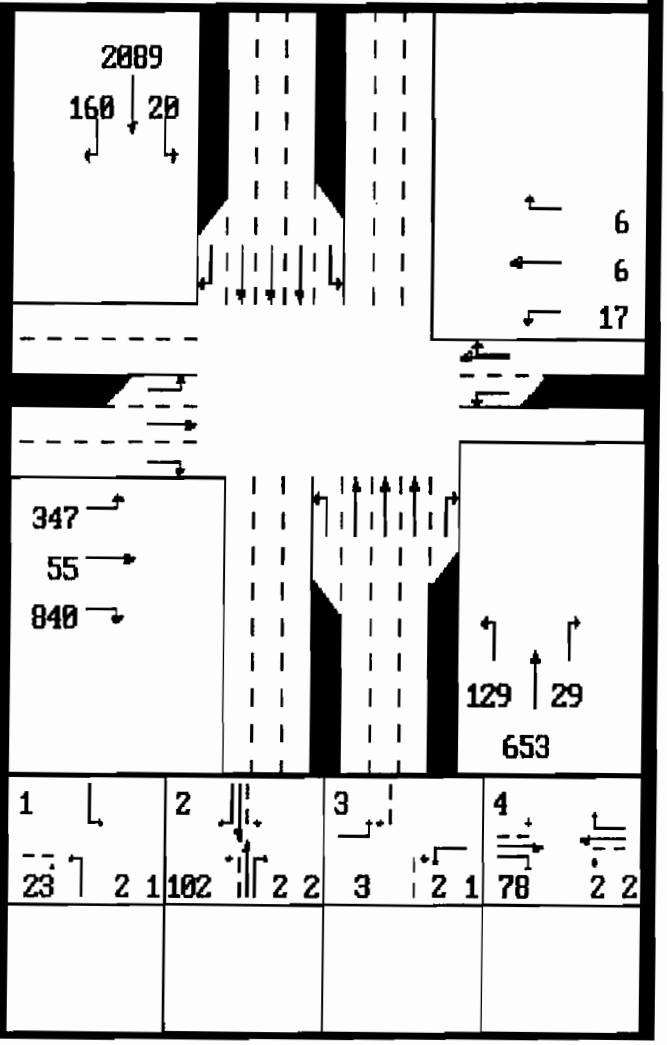
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	182.4	3487.8	400.4	27
WB	645.6	17545.7	1980.3	21
NB	651.9	19798.7	2230.7	4
SB	527.8	13625.3	1516.8	30
All	502.6	13614.6	1531.7	

HCM Summary Results for Case: KLSPEXAM Keller Sprng/Midway Road

Existing Conditions AM Peak Version 3.06

				- Lane Grp - Delay (sec/veh)	LOS	- App - Delay (sec/veh)	LOS
Lane Grp		v/s	v/c				
EB	Lper	0.21				61.0	F
	Lpro	*0.01	0.57#	41.6	E		
	T	0.03	0.09	35.5	D		
	R	*0.48	1.01	72.4	F		
WB	Lper	0.00				32.9	D
	Lpro	0.01	0.04#	31.9	D		
	TR	0.01	0.02	34.6	D		
NB	Lper	0.00				31.9	D
	Lpro	0.08	0.66#	57.7	E		
	T	0.15	0.31	27.7	D		
	R	0.02	0.04	21.7	C		
SB	Lper	0.00				51.7	E
	Lpro	0.01	0.06#	14.9	B		
	T	*0.47	1.00	53.9	E		
	R	0.11	0.23	24.0	C		
	Int.	0.97	1.01	50.0	E	#L	TOTAL



Input Data for Case: KLSPEXAM — Keller Sprng/Midway Road

Existing Conditions — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	5	5
Outbound Street	1	2	3	3

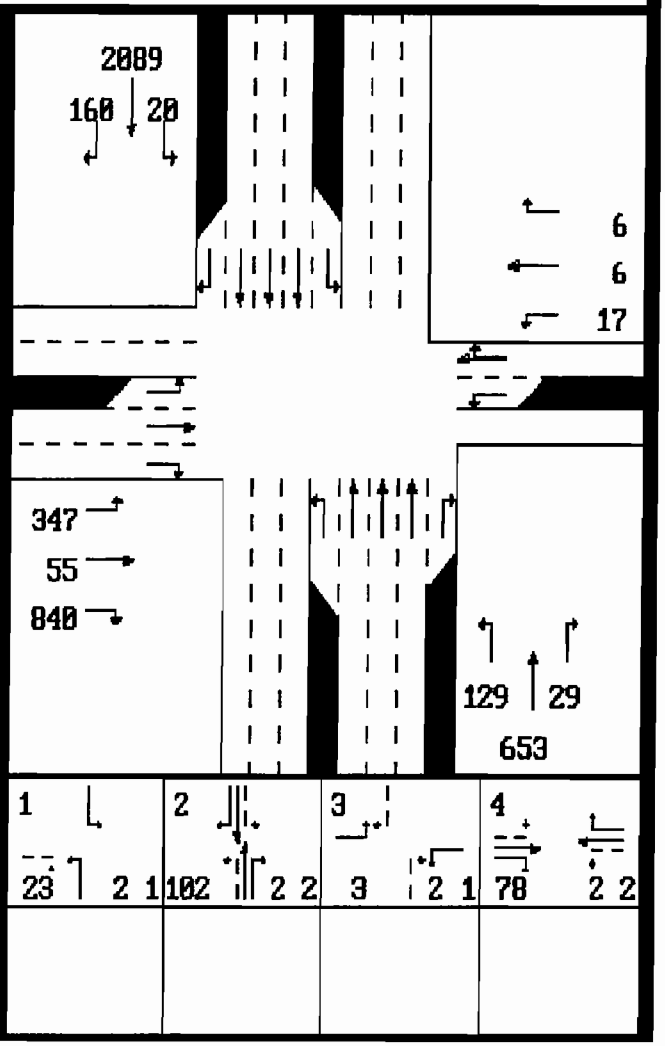
2)

	-Pkt Lanes- Left	Right	--Lane Lengths-- Full L	Pkt	R Pkt
EB	1	0	1000	150	
WB	1	0	1000	50	
NB	1	1	1000	210	50
SB	1	1	1000	150	50

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

	Median	2	3	4	5	6
EB		12.0	12.0	12.0		
WB		12.0	12.0			
NB		12.0	12.0	12.0	12.0	12.0
SB		12.0	12.0	12.0	12.0	12.0

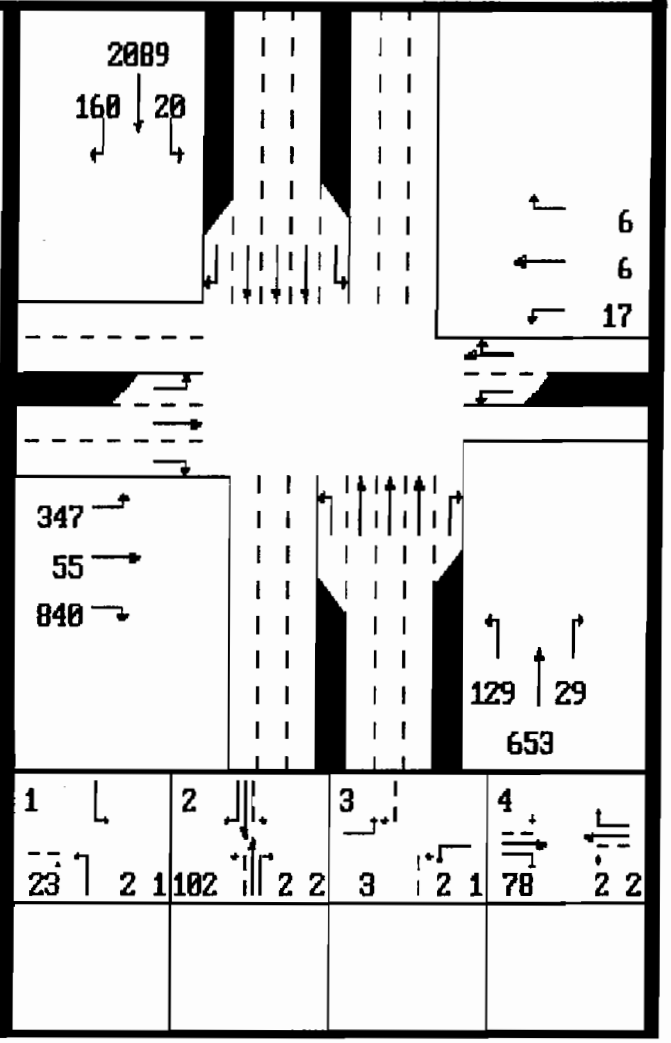


NETSIM Results for Case: KLSPEXAM Keller Sprng/Midway Road

Existing Conditions AM Peak Version 3.06

Simulation indicates specified peak period volumes exceed entry capacity of following approaches probably due to spillback into upstream intersection:

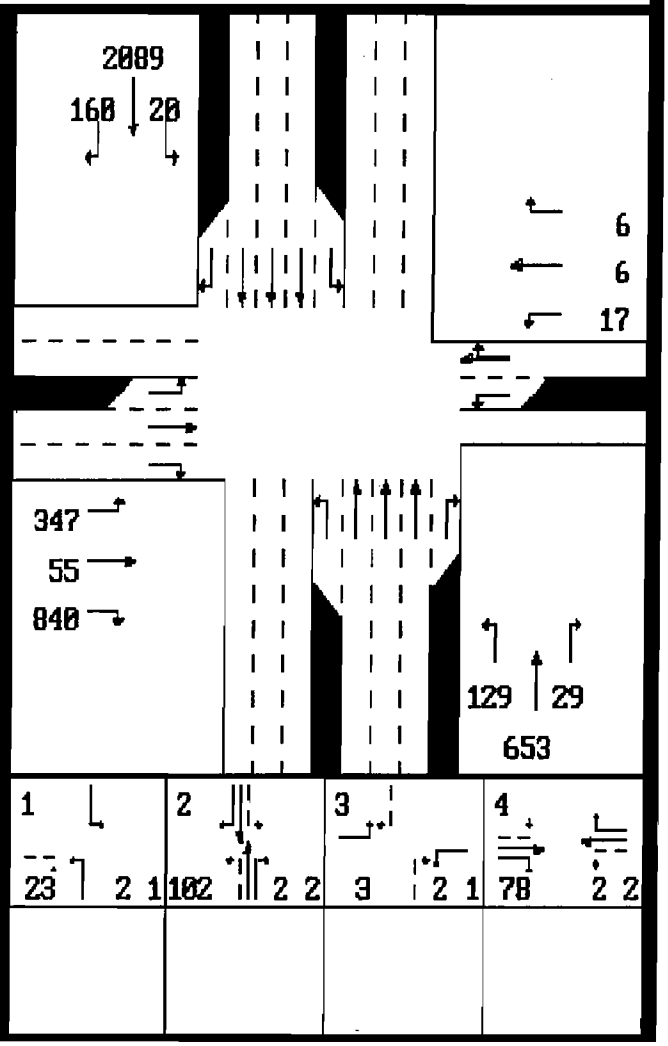
EASTBOUND



NETSIM Summary for Case: KLSPEXAM — Keller Sprng/Midway Road

Existing Conditions — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	16/ 20	2.6	22.8
	T	1/ 2	12.8	0.0
	R	40/ 50	3.4	26.1
	All		4.3	26.1
WB	L	1/ 2	2.4	0.0
	TR	1/ 2	14.1	0.0
	All		11.4	0.0
NB	L	12/ 14	1.1	13.4
	T	1/ 1	22.0	0.0
	R	0/ 1	16.4	0.0
	All		12.7	13.4
SB	L	3/ 5	1.7	0.0
	T	15/ 23	11.2	0.0
	R	6/ 7	11.7	0.0
	All		11.1	0.0
Intersect.			8.3	



NETSIM Results for Case: KLSPEXAM — Keller Sprng/Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	16	20	22.8	100.0	0.0	4:31
	T	1	2	0.0			10:15
	R	40	50	26.1			7:31
WB	L	1	2	0.0	0.0	0.0	0:51
	TR	1	2	0.0			4:13
NB	L	12	14	13.4	50.0	0.0	7:54
	T	1	1	0.0			4:31
	R	0	1	0.0	0.0	0.0	4:36
SB	L	3	5	0.0	0.0	0.0	1:16
	T	15	23	0.0			13:57
	R	6	7	0.0	0.0	100.0	2:43

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: KLSPEXAM — Keller Sprng/Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	8.7	0.1	0.0	5.9	4.8	0.0
WB	0.1	0.0	0.0	15.7	0.0	0.0
NB	4.2	0.7	0.0	10.1	4.2	0.0
SB	12.3	0.1	0.0	10.1	4.4	0.0
All	25.3	0.9	0.0	8.7	4.3	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	418.4	7027.4	1014.5	23
WB	5.1	61.7	9.0	1
NB	239.8	7975.3	850.3	1
SB	661.5	17878.2	2248.5	3
All	331.2	8235.7	1030.6	

Input Data for Case: KLSPAMQ3 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	5	2	6	6
Outbound Street	2	2	3	3

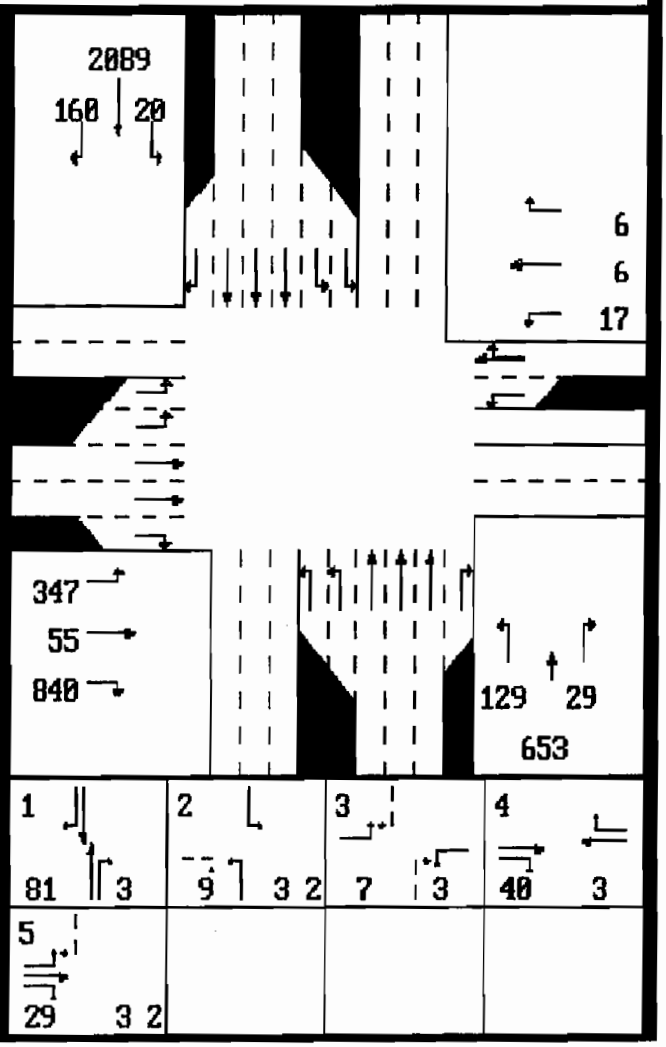
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt	R Pkt
EB	2	1	1000	150	300
WB	1	0	1000	50	
NB	2	1	1000	200	200
SB	2	1	1000	200	200

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

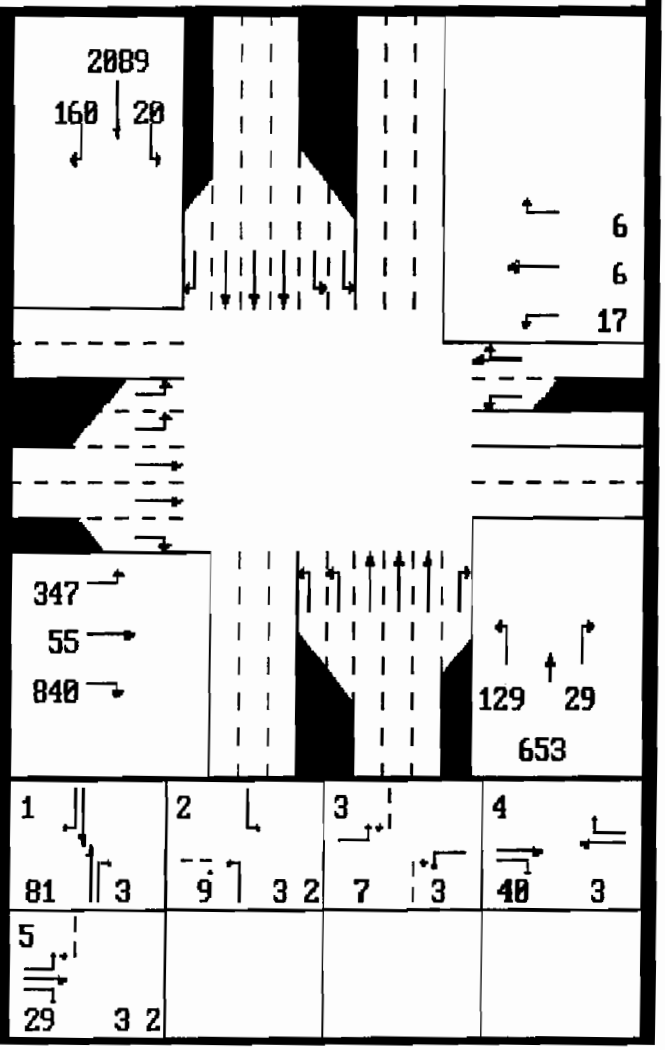
	Median	2	3	4	5	6
EB	12.0	12.0	12.0	12.0	12.0	
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	12.0
SB	12.0	12.0	12.0	12.0	12.0	12.0



NETSIM Summary for Case: KLSPAMQ3 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	7/ 10	1.8	53.6
	T	1/ 2	3.9	38.2
	R	44/ 50	2.1	0.0
	All		3.2	53.6
WB	L	1/ 2	0.5	0.0
	TR	1/ 1	16.0	0.0
	All		6.8	0.0
NB	L	5/ 6	3.6	0.0
	T	2/ 3	20.0	0.0
	R	0/ 1	22.9	0.0
	All		17.0	0.0
SB	L	2/ 3	1.9	0.0
	T	13/ 19	12.5	0.0
	R	2/ 3	15.6	0.0
	All		12.3	0.0
Intersect.			8.1	



NETSIM Results for Case: KLSPAMQ3 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	7	10	53.6	20.0	0.0	0:33
	T	1	2	38.2			5:02
	R	44	50	0.0	100.0	0.0	5:09
WB	L	1	2	0.0	0.0	0.0	14:41
	TR	1	1	0.0			2:27
NB	L	5	6	0.0	0.0	0.0	2:34
	T	2	3	0.0			8:51
	R	0	1	0.0	0.0	0.0	8:48
SB	L	2	3	0.0	0.0	60.0	1:53
	T	13	19	0.0			13:33
	R	2	3	0.0	0.0	80.0	10:31

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: KLSPAMQ3 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	9.4	0.1	0.0	4.4	3.5	0.0
WB	0.2	0.0	0.0	11.2	0.0	0.0
NB	3.5	0.6	0.0	11.4	4.6	0.0
SB	11.8	0.2	0.0	10.4	5.0	0.0
All	24.9	0.8	0.0	8.3	4.5	0.0

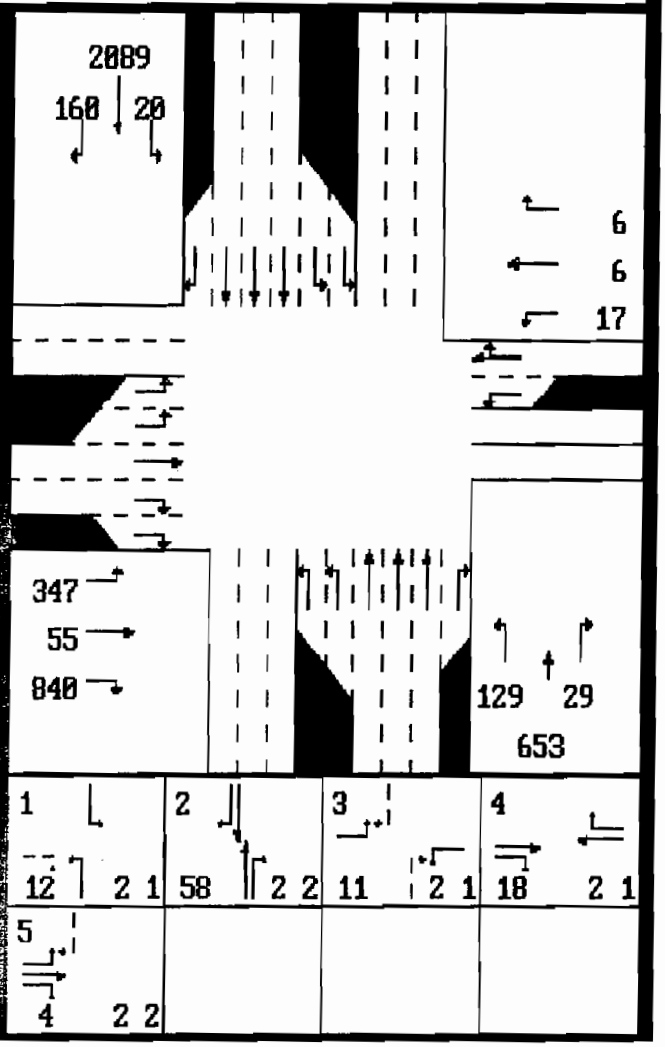
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	450.1	7633.4	1114.2	17
WB	7.3	80.6	10.4	1
NB	202.9	7168.2	761.9	1
SB	663.6	20097.2	2290.8	9
All	331.0	8744.9	1044.3	

HCM Summary Results for Case: KLSPAM1 Keller Sprng/Midway Road

Exist. Traffic w/ ~~CMAQ~~ other Improvements AM Peak Version 3.06

	Lane Grp	v/s	X v/c	Lane Grp Delay (sec/veh)	LOS	App Delay (sec/veh)	LOS
EB	L	*0.11	0.68	38.5	D	37.3	D
	T	0.03	0.14	28.9	D		
	R	*0.31	0.91	37.4	D		
WB	L	0.01	0.14	38.1	D	36.2	D
	TR	0.01	0.05	33.2	D		
NB	L	0.04	0.42	39.0	D	17.4	C
	T	0.15	0.30	13.8	B		
	R	0.02	0.03	7.1	B		
SB	L	0.01	0.07	37.2	D	24.6	C
	T	*0.47	0.95	25.8	D		
	R	0.11	0.18	6.3	B		
	Int.	0.89	0.96	26.6	D		



Input Data for Case: KLSPAM1 — Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	5	2	6	6
Outbound Street	1	2	3	3

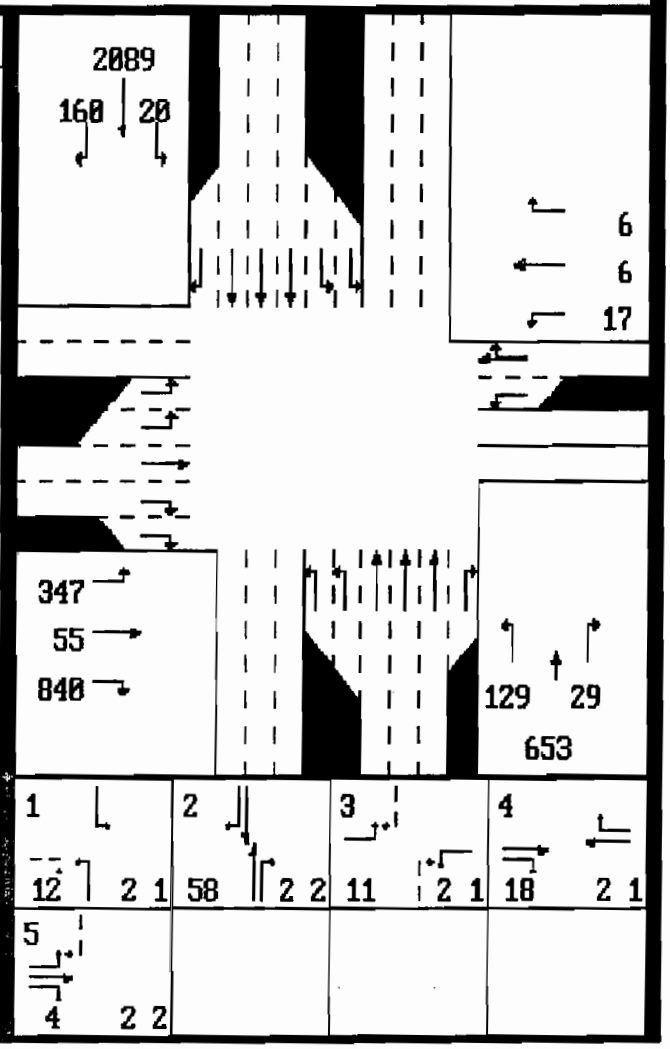
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt R	Pkt
EB	2	1	1000	150	100
WB	1	0	1000	50	
NB	2	1	1000	200	200
SB	2	1	1000	150	250

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

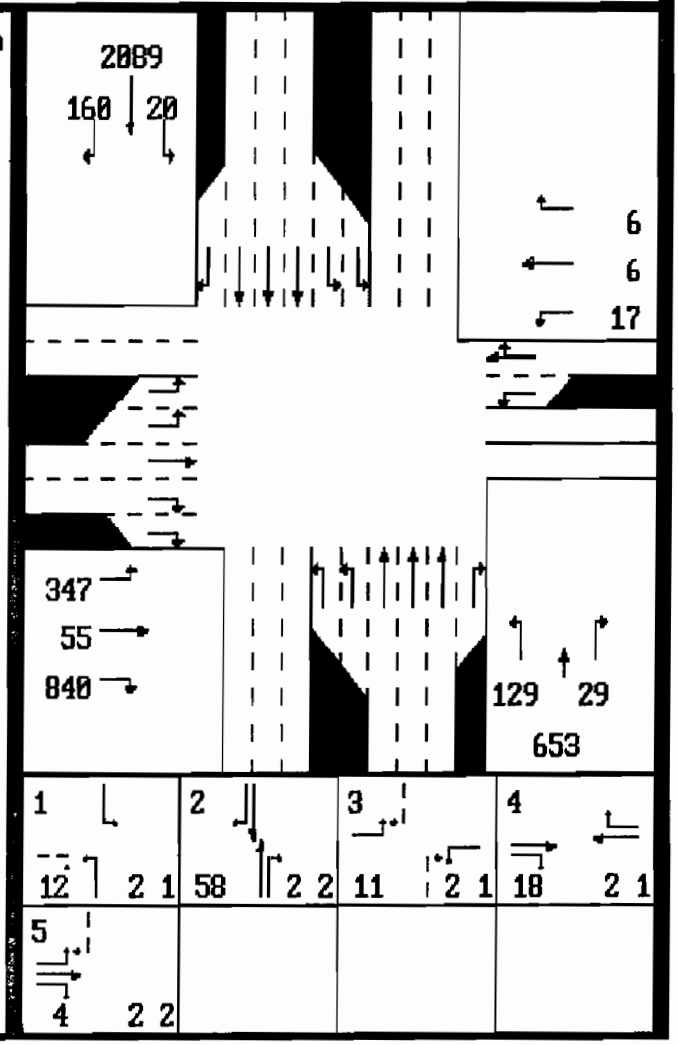
	Median	2	3	4	5	6
EB	12.0	12.0	12.0	12.0	12.0	
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	12.0
SB	12.0	12.0	12.0	12.0	12.0	12.0



NETSIM Summary for Case: KLSPAM1 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	5/ 8	2.5	0.0
	T	1/ 2	23.5	0.0
	R	12/ 32	7.8	0.0
	All		8.4	0.0
WB	L	1/ 1	0.9	0.0
	TR	0/ 1	24.2	0.0
	All		10.2	0.0
NB	L	4/ 5	2.1	0.0
	T	1/ 1	24.0	0.0
	R	0/ 0	21.5	0.0
	All		16.6	0.0
SB	L	1/ 2	1.5	0.0
	T	8/ 11	16.4	0.0
	R	1/ 2	15.5	0.0
	All		16.1	0.0
Intersect.			12.9	



NETSIM Results for Case: KLSPAM1 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	5	8	0.0	0.0	0.0	0:05
	T	1	2	0.0			10:12
	R	12	32	0.0	0.0	0.0	14:19
WB	L	1	1	0.0	0.0	0.0	0:01
	TR	0	1	0.0			2:27
NB	L	4	5	0.0	0.0	0.0	2:19
	T	1	1	0.0			10:22
	R	0	0	0.0	0.0	0.0	0:00
SB	L	1	2	0.0	0.0	0.0	0:23
	T	8	11	0.0			11:23
	R	1	2	0.0	0.0	25.0	2:32

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: KLSPAM1 Keller Sprng/Midway Road
Exist. Traffic w/ CMAQ Improvements AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	6.0	0.0	0.0	10.5	10.6	0.0
WB	0.1	0.0	0.0	15.0	0.0	0.0
NB	3.2	0.5	0.0	11.5	4.9	0.0
SB	9.5	0.1	0.0	12.6	6.0	0.0
All	18.9	0.7	0.0	11.7	5.3	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

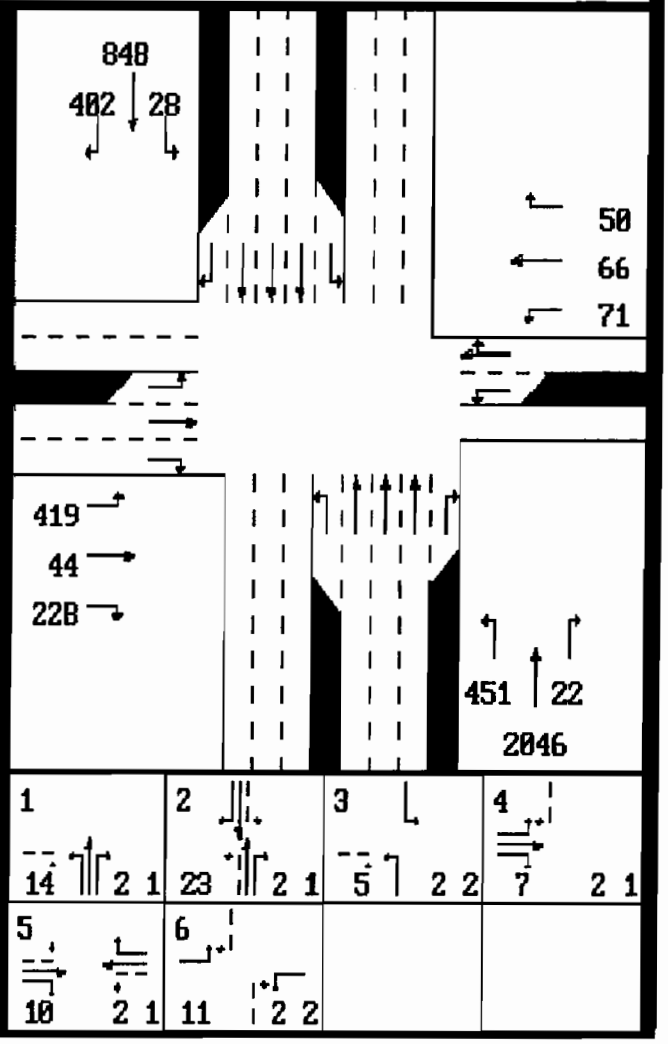
	HC	CO	NOX	RTOR Maneuvers Completed
EB	297.2	5166.8	719.8	31
WB	5.5	63.8	9.0	1
NB	188.3	6627.8	699.9	0
SB	538.5	16432.2	1845.2	8
All	257.4	7072.6	818.5	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: KLSPEXPM Keller Sprng/Midway Road

Existing Conditions PM Peak Version 3.06

	Lane Grp	v/s	X v/c	Delay (sec/veh)	L O S	App Delay (sec/veh)	L O S
EB	Lper	0.00				29.5	D
	Lpro	*0.27	0.91#	37.9	D		
	T	0.03	0.12	21.3	C		
	R	0.12	0.25	10.6	B		
WB	Lper	0.06				30.1	D
	Lpro	0.00	0.21#	20.7	C		
	TR	*0.08	0.69	35.9	D		
NB	Lper	0.00				26.9	D
	Lpro	*0.28	0.92#	31.3	D		
	T	0.44	0.99	26.2	D		
	R	0.01	0.02	6.2	B		
SB	Lper	0.10				21.5	C
	Lpro	0.00	0.16#	27.5	D		
	T	*0.19	0.74	24.5	C		
	R	0.20	0.40	10.9	B		
	Int.	0.81	0.94	25.9	D	#L	TOTAL



Input Data for Case: KLSPEXPM — Keller Sprng/Midway Road

Existing Conditions — PM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	5	5
Outbound Street	1	2	3	3

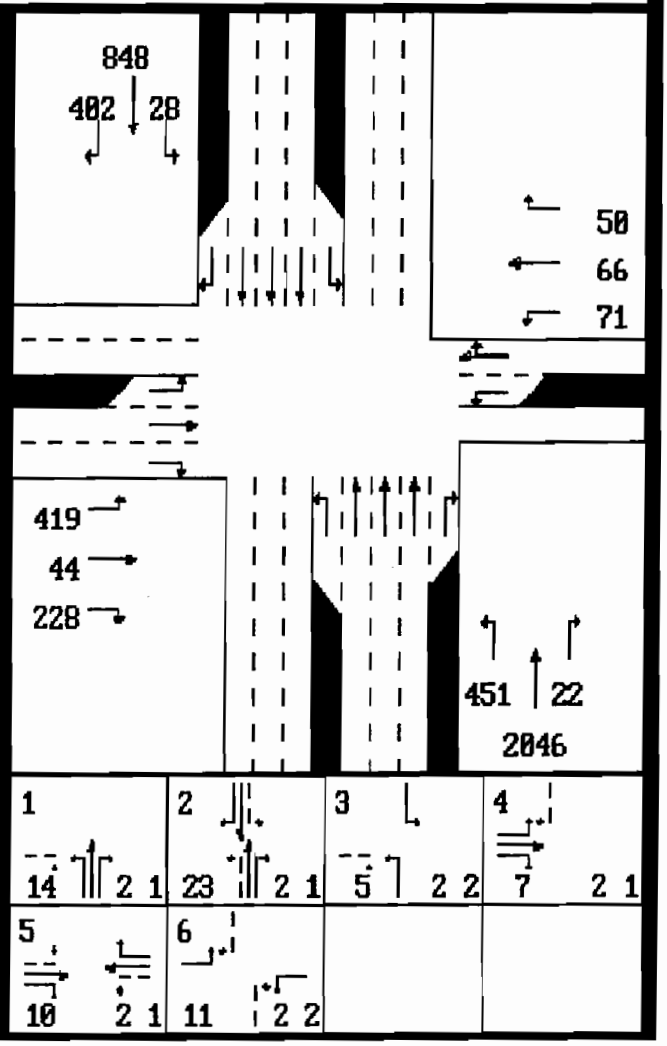
2)

	-Pkt Lanes- Left	Right	--Lane Lengths-- Full L	Pkt	R Pkt
EB	1	0	1000	150	
WB	1	0	1000	50	
NB	1	1	1000	210	50
SB	1	1	1000	150	50

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

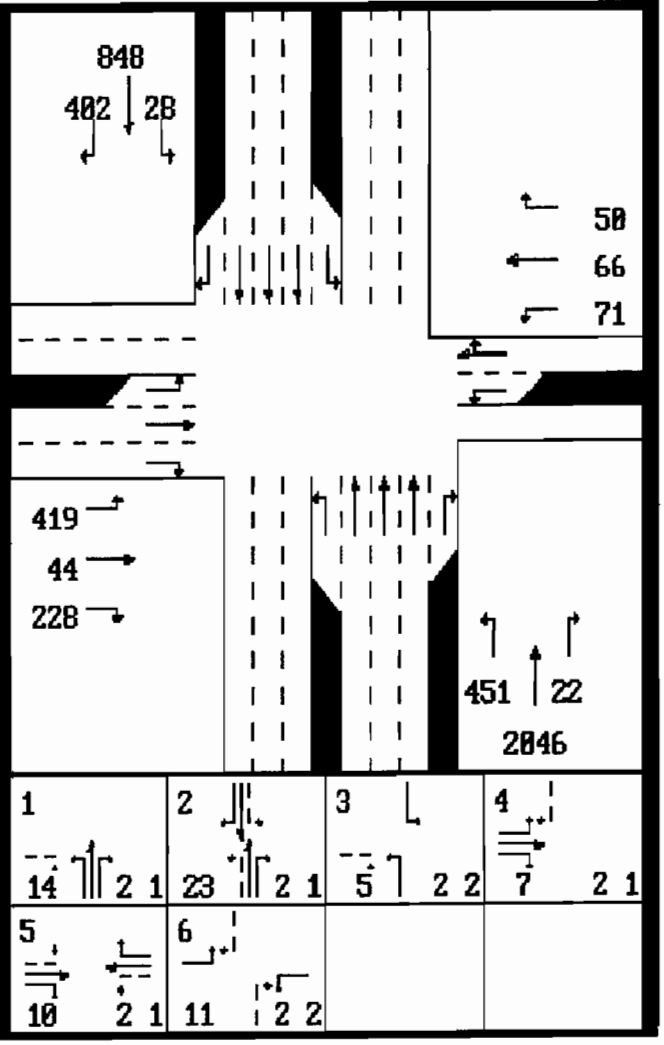
	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	
SB	12.0	12.0	12.0	12.0	12.0	



NETSIM Summary for Case: KLSPEXPM — Keller Sprng/Midway Road

Existing Conditions — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	12/ 22	2.7	30.9
	T	1/ 1	13.4	0.0
	R	2/ 4	21.7	0.0
	All		10.6	30.9
WB	L	1/ 2	2.0	0.0
	TR	4/ 6	10.7	0.0
	All		10.0	0.0
NB	L	21/ 24	1.8	54.8
	T	9/ 12	12.5	0.0
	R	1/ 1	11.0	0.0
	All		10.4	54.8
SB	L	0/ 1	8.3	0.0
	T	5/ 10	11.5	0.0
	R	6/ 8	5.0	0.0
	All		11.2	0.0
Intersect.			10.6	



NETSIM Results for Case: KLSPEXPM Keller Sprng/Midway Road

Existing Conditions PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	12	22	30.9	80.0	0.0	13:21
	T	1	1	0.0			0:34
	R	2	4	0.0			8:39
WB	L	1	2	0.0	0.0	40.0	0:01
	TR	4	6	0.0			7:11
NB	L	21	24	54.8	90.0	0.0	7:09
	T	9	12	0.0			8:04
	R	1	1	0.0	0.0	30.0	1:18
SB	L	0	1	0.8	0.0	0.0	5:53
	T	5	10	0.0			1:39
	R	6	8	0.0	40.0	50.0	13:38

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: KLSPEXPM — Keller Sprng/Midway Road

Existing Conditions — PM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	2.9	0.0	0.0	12.6	13.5	0.0
WB	0.7	0.1	0.0	13.9	6.4	0.0
NB	13.8	0.2	0.0	9.4	4.8	0.0
SB	6.6	0.5	0.0	10.0	4.4	0.0
All	24.0	0.8	0.0	10.1	5.2	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

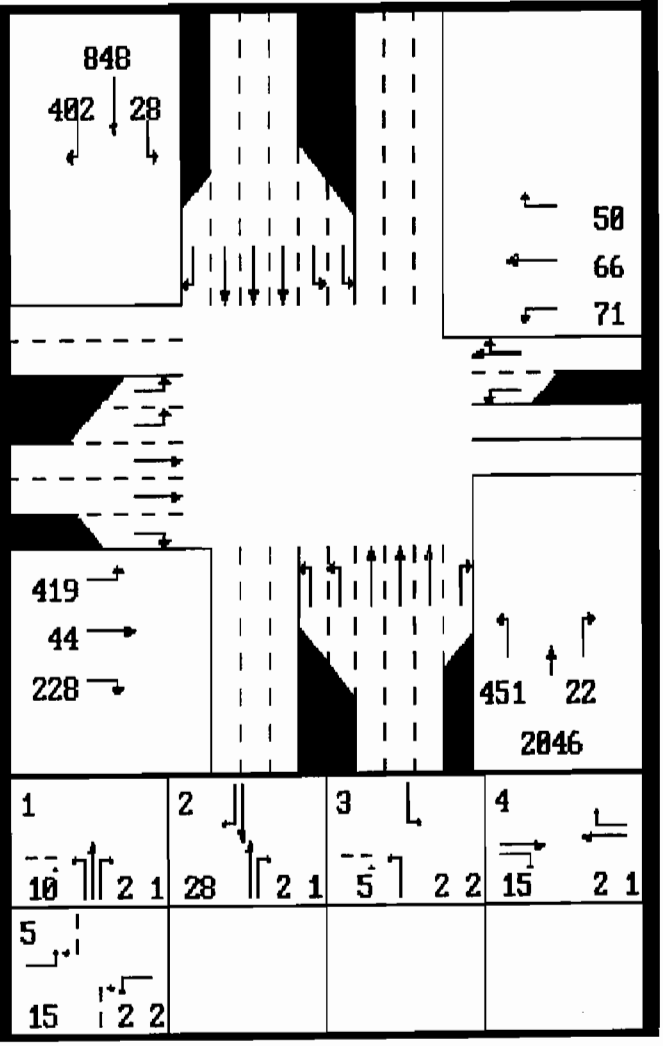
	HC	CO	NOX	RTOR Maneuvers Completed
EB	144.7	2433.2	343.6	22
WB	33.5	435.3	61.4	9
NB	762.2	22061.0	2583.3	2
SB	372.8	11416.0	1250.3	41
All	328.3	9086.4	1059.7	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

NETSIM Summary for Case: KLSPPMQ — Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	6/ 8	3.0	0.0
	T	1/ 1	26.0	0.0
	R	2/ 4	13.4	0.0
	All		13.4	0.0
WB	L	1/ 2	1.4	0.0
	TR	4/ 8	10.7	0.0
	All		9.6	0.0
NB	L	4/ 6	4.8	0.0
	T	9/ 13	16.5	0.0
	R	0/ 1	16.9	0.0
	All		15.1	0.0
SB	L	1/ 1	14.7	0.0
	T	5/ 9	14.9	0.0
	R	5/ 10	7.9	0.0
	All		14.1	0.0
Intersect.			14.2	



NETSIM Results for Case: KLSPPMQ Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	6	8	0.0	0.0	0.0	12:04
	T	1	1	0.0			0:34
	R	2	4	0.0	0.0	0.0	8:39
WB	L	1	2	0.0	0.0	40.0	0:01
	TR	4	8	0.0			13:22
NB	L	4	6	0.0	0.0	10.0	14:42
	T	9	13	0.0			11:06
	R	0	1	0.0	0.0	0.0	1:14
SB	L	1	1	0.8	0.0	0.0	1:14
	T	5	9	0.0			1:37
	R	5	10	0.0	10.0	0.0	11:58

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: KLSPPMQ Keller Sprng/Midway Road
Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	2.6	0.1	0.0	14.5	10.0	0.0
WB	0.7	0.1	0.0	13.6	4.5	0.0
NB	10.7	0.2	0.0	12.2	5.6	0.0
SB	6.2	0.5	0.0	10.7	4.6	0.0
All	20.2	0.8	0.0	12.1	5.2	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

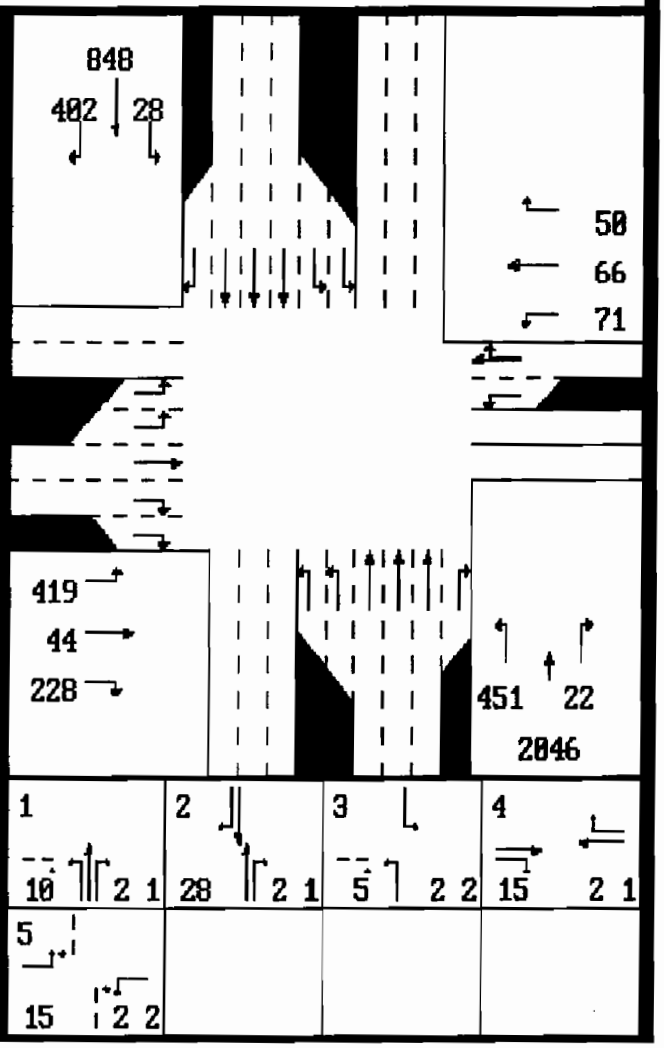
	HC	CO	NOX	RTOR Maneuvers Completed
EB	134.4	3014.5	364.0	26
WB	34.6	481.8	65.5	6
NB	605.0	18512.4	2066.2	2
SB	358.3	12162.9	1291.3	55
All	283.1	8542.9	946.7	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: KLSPPM2 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ + Other Impr PM Peak Version 3.06

	Lane Grp	v/s	X v/c	- Lane Grp - Delay (sec/ veh)	L O S	- App - Delay (sec/ veh)	L O S
EB	L	*0.14	0.78	31.2	D	25.5	D
	T	0.03	0.16	24.4	C		
	R	*0.08	0.19	12.9	B		
WB	L	0.05	0.26	24.4	C	25.7	D
	TR	0.08	0.46	26.6	D		
NB	L	0.14	0.68	25.7	D	23.0	C
	T	*0.44	0.96	22.6	C		
	R	0.01	0.02	4.7	A		
SB	L	*0.01	0.14	30.1	D	18.5	C
	T	0.19	0.61	20.4	C		
	R	0.20	0.41	11.4	B		
	Int.	0.66	0.77	22.3	C		



Input Data for Case: KLSPPM2 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ + Other Impr PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	5	2	6	6
Outbound Street	1	2	3	3

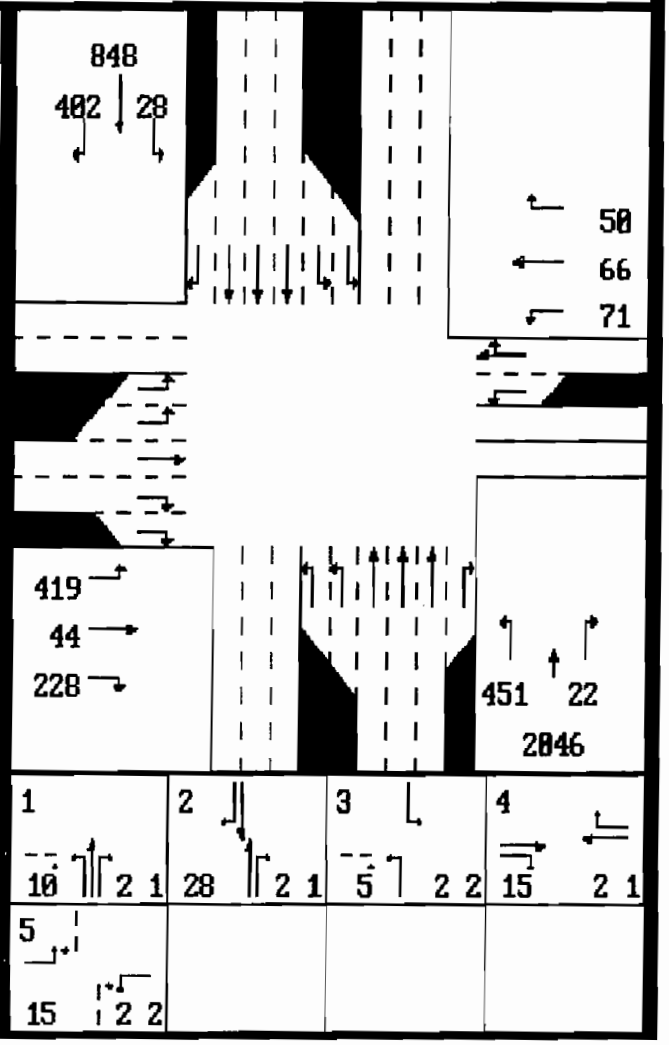
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt R	Pkt
EB	2	1	1000	150	100
WB	1	0	1000	100	
NB	2	1	1000	200	200
SB	2	1	1000	150	250

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

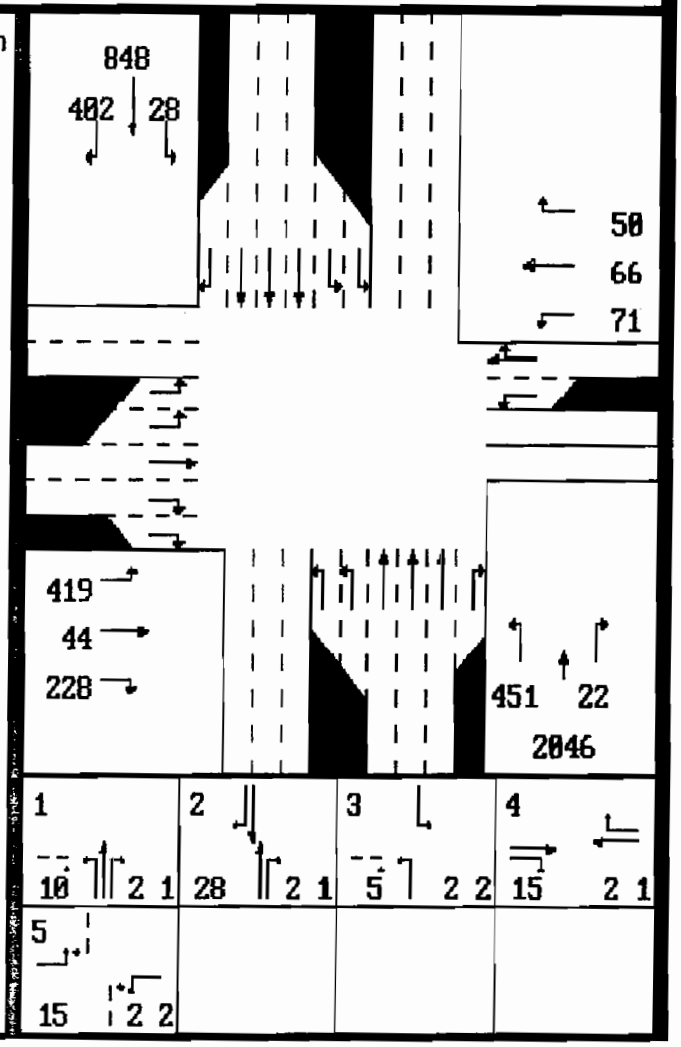
	Median	2	3	4	5	6
EB	12.0	12.0	12.0	12.0	12.0	
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	12.0
SB	12.0	12.0	12.0	12.0	12.0	12.0



NETSIM Summary for Case: KLSPPM2 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ + Other Impr PM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	5/ 8	3.0	0.0
	T	1/ 3	24.8	0.0
	R	1/ 2	22.1	0.0
	All		13.8	0.0
WB	L	1/ 2	2.3	0.0
	TR	3/ 7	12.6	0.0
	All		10.9	0.0
NB	L	4/ 6	4.6	0.0
	T	9/ 13	16.2	0.0
	R	0/ 1	16.8	0.0
	All		14.8	0.0
SB	L	1/ 1	5.6	0.0
	T	4/ 6	15.7	0.1
	R	6/ 11	8.2	0.0
	All		14.4	0.1
Intersect.			14.3	



NETSIM Results for Case: KLSPPM2 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ + Other Impr PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	5	8	0.0	0.0	0.0	11:04
	T	1	3	0.0			14:36
	R	1	2	0.0	0.0	0.0	4:43
WB	L	1	2	0.0	0.0	0.0	3:25
	TR	3	7	0.0			12:23
NB	L	4	6	0.0	0.0	10.0	10:41
	T	9	13	0.0			10:08
	R	0	1	0.0	0.0	0.0	0:14
SB	L	1	1	0.0	0.0	0.0	3:03
	T	4	6	0.1			0:35
	R	6	11	0.0	0.0	0.0	14:03

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: KLSPPM2 Keller Sprng/Midway Road

Exist. Traffic w/ CMAQ + Other Impr PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	2.4	0.0	0.0	15.6	9.3	0.0
WB	0.7	0.1	0.0	14.6	5.5	0.0
NB	10.7	0.2	0.0	12.2	5.7	0.0
SB	6.1	0.5	0.0	10.7	4.3	0.0
All	19.9	0.8	0.0	12.2	5.0	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

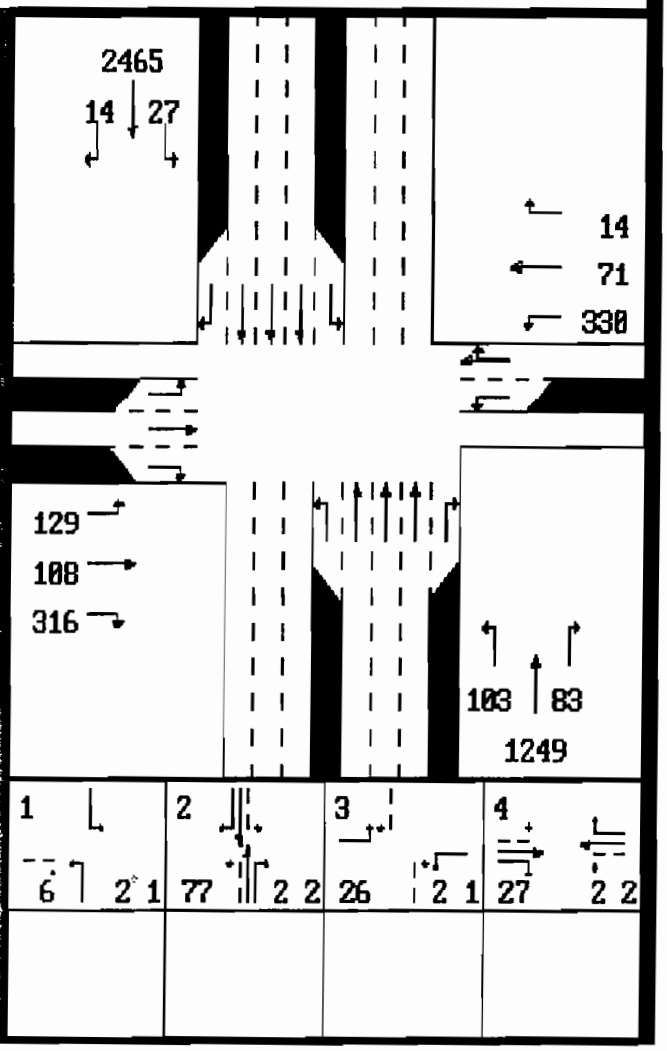
	HC	CO	NOX	RTOR Maneuvers Completed
EB	121.1	2255.0	301.7	29
WB	31.9	472.2	64.5	7
NB	601.0	18166.0	2025.2	2
SB	352.2	12085.5	1280.2	48
All	276.6	8244.7	917.9	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: BELTEXAM Beltway Dr /Midway Road

Existing Conditions AM Peak Version 3.06

			- Lane Grp -		- App -	
			Delay	L	Delay	L
	Lane	X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	Lper	0.00				53.1	E
	Lpro	0.09	0.33#	24.5	C		
	T	0.07	0.39	41.0	E		
	R	*0.24	0.97	69.6	F		
WB	Lper	0.19				53.9	E
	Lpro	*0.17	0.97#	57.3	E		
	TR	0.07	0.35	40.6	E		
NB	Lper	0.46				21.5	C
	Lpro	0.04	0.94#	71.2	F		
	T	0.27	0.52	18.1	C		
	R	0.02	0.02	4.8	A		
SB	Lper	0.00				39.0	D
	Lpro	0.02	0.18#	11.4	B		
	T	*0.53	1.01	39.4	D		
	R	0.01	0.01	4.7	A		
	Int.	0.94	1.00	37.4	D	#L	TOTAL



Input Data for Case: BELTEXAM Beltway Dr /Midway Road

Existing Conditions AM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	5	5
Outbound Street	1	1	3	3

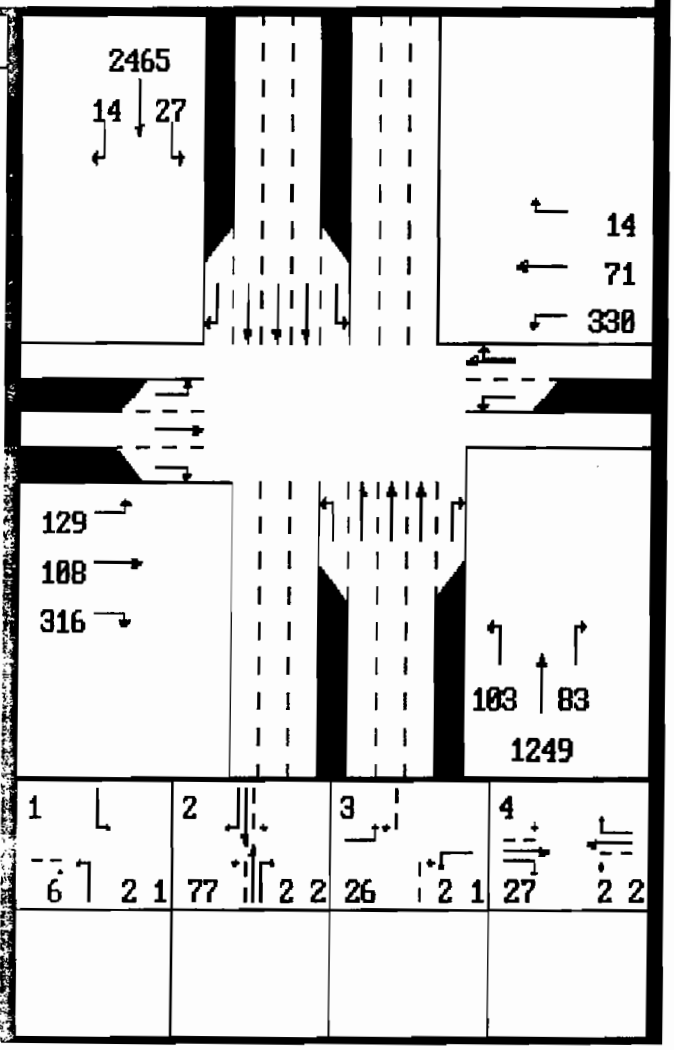
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L Pkt	R Pkt	
EB	1	1	1000	75	75
WB	1	0	1000	125	
NB	1	1	1000	115	75
SB	1	1	1000	100	100

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	
SB	12.0	12.0	12.0	12.0	12.0	

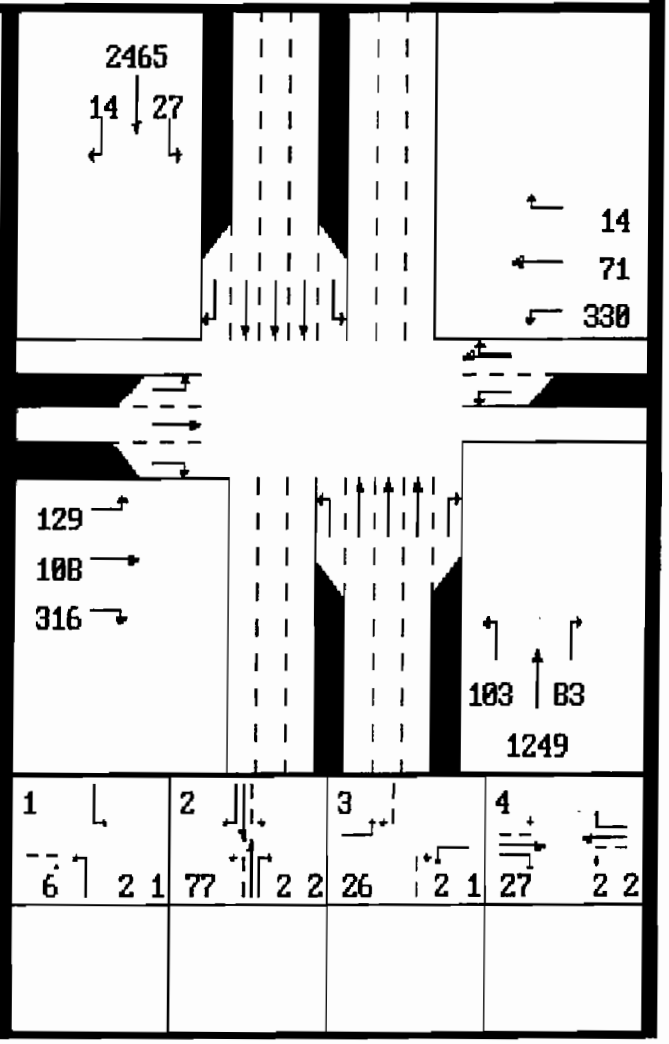


NETSIM Results for Case: BELTEXAM Beltway Dr /Midway Road

Existing Conditions AM Peak Version 3.06

Simulation results indicate that the peak period traffic movements identified by X are oversaturated and cannot be serviced

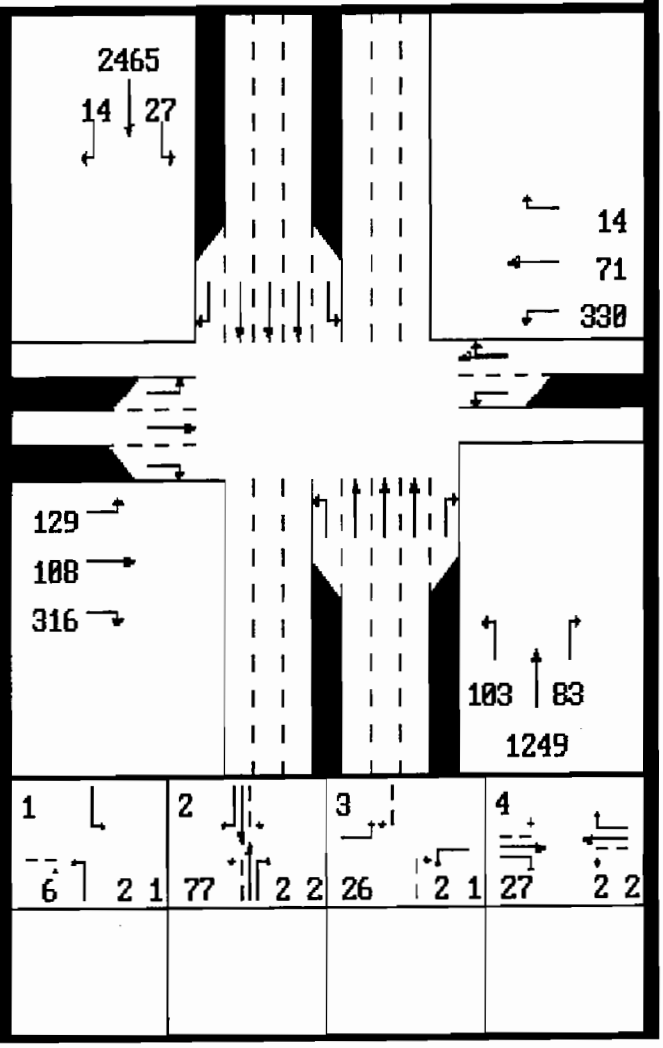
Approach	Left	Thru	Right
WB	X		
NB	X		



NETSIM Summary for Case: BELTEXAM — Beltway Dr /Midway Road

Existing Conditions — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	7/ 12	1.5	33.6
	T	7/ 13	9.1	0.0
	R	9/ 13	2.2	0.0
	All		7.3	33.6
WB	L	24/ 31	1.9	66.3
	TR	4/ 6	5.2	0.0
	All		4.5	66.3
NB	L	19/ 24	0.2	86.7
	T	8/ 14	8.9	0.0
	R	2/ 4	14.5	0.0
	All		7.6	86.7
SB	L	2/ 3	1.7	0.0
	T	12/ 17	14.3	0.0
	R	1/ 3	16.6	0.0
	All		14.1	0.0
Intersect.			9.0	



NETSIM Results for Case: BELTEXAM Beltway Dr /Midway Road

Existing Conditions AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	7	12	33.6	50.0	66.7	11:23
	T	7	13	0.0			14:26
	R	9	13	0.0	50.0	83.3	8:48
WB	L	24	31	66.3	83.3	16.7	13:52
	TR	4	6	0.0			1:55
NB	L	19	24	86.7	83.3	0.0	13:57
	T	8	14	0.0			12:03
	R	2	4	0.0	0.0	50.0	11:54
SB	L	2	3	0.0	0.0	33.3	0:19
	T	12	17	0.0			2:56
	R	1	3	0.0	0.0	50.0	0:15

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: BELTEXAM Beltway Dr /Midway Road

Existing Conditions AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	3.4	0.1	0.0	9.4	7.6	0.0
WB	4.1	0.2	0.0	6.3	4.2	0.0
NB	8.6	0.8	0.0	7.8	4.0	0.0
SB	10.6	0.7	0.0	11.7	5.4	0.0
All	26.8	1.8	0.0	9.3	4.7	0.0

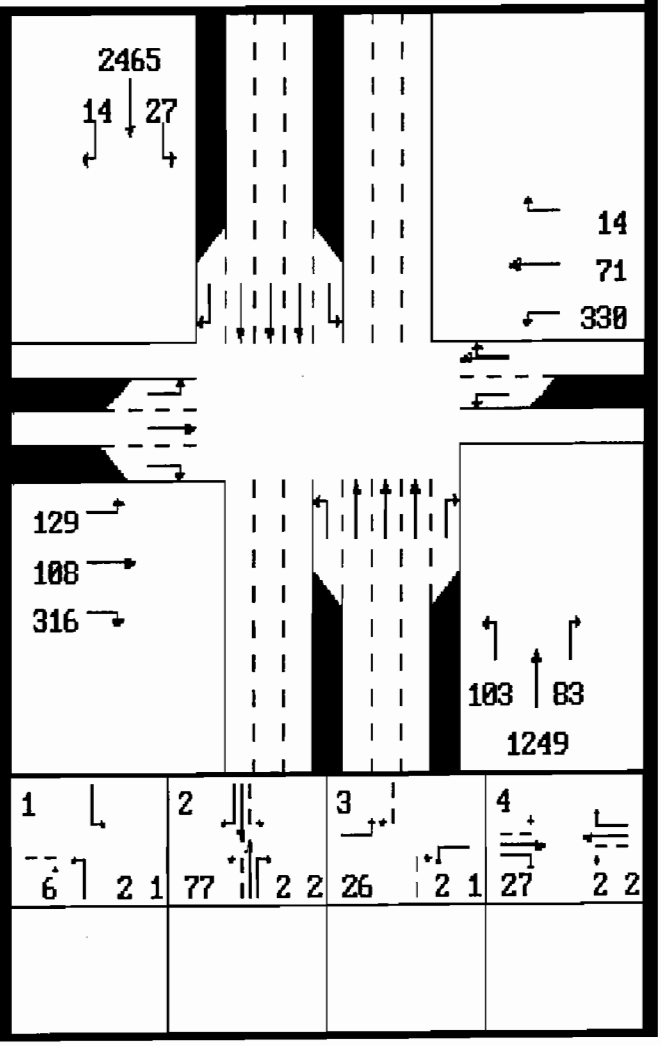
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	170.3	2782.4	406.6	41
WB	201.6	3170.0	476.1	0
NB	485.4	14128.8	1541.8	0
SB	591.8	17401.0	2004.9	0
All	362.3	9370.5	1107.4	

HCM Summary Results for Case: BELTAM2 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ & Other Impr AM Peak Version 3.06

			- Lane Grp -		- App -	
			Delay	L	Delay	L
Lane		X	(sec/	O	(sec/	O
Grp	v/s	v/c	veh)	S	veh)	S
EB Lper	0.00				41.2	E
Lpro	0.09	0.33#	24.5	C		
T	0.07	0.39	41.0	E		
R	*0.20	0.82	49.6	E		
WB Lper	0.19				53.9	E
Lpro	*0.17	0.97#	57.3	E		
TR	0.06	0.35	40.6	E		
NB Lper	0.46				21.5	C
Lpro	0.04	0.94#	71.2	F		
T	0.27	0.52	18.1	C		
R	0.02	0.02	4.8	A		
SB Lper	0.00				39.0	D
Lpro	0.02	0.18#	11.4	B		
T	*0.53	1.01	39.4	D		
R	0.01	0.01	4.7	A		
Int.	0.90	0.96	35.9	D	#L	TOTAL



Input Data for Case: BELTAM2 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ & Other Impr AM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	5	5
Outbound Street	1	1	3	3

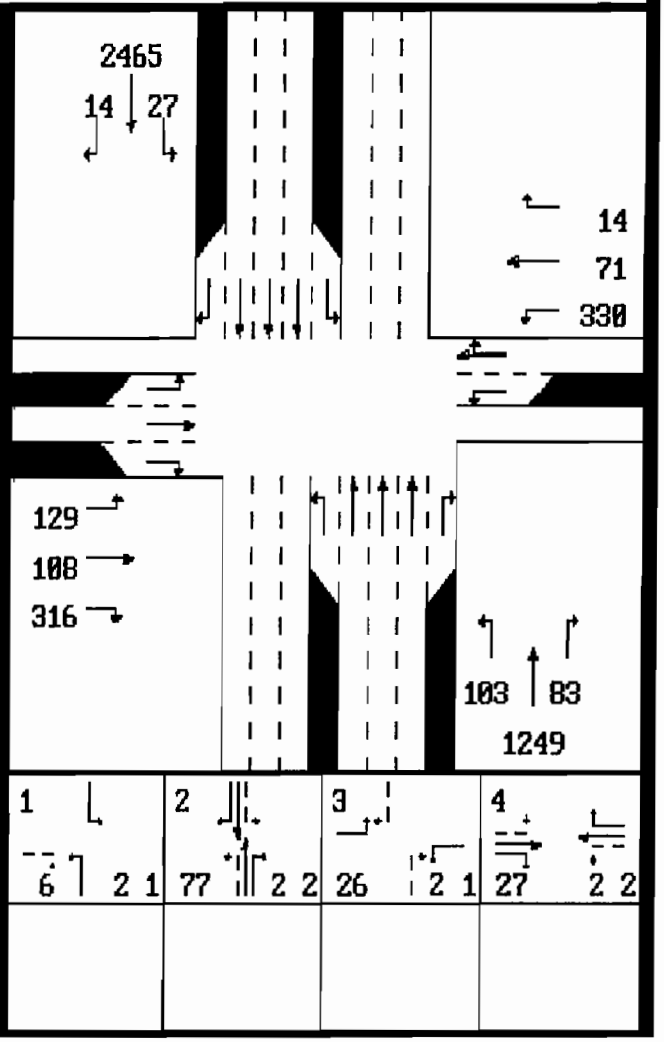
2)

	-Pkt Lanes-		—Lane Lengths—		
	Left	Right	Full L	Pkt R	Pkt
EB	1	1	1000	150	150
WB	1	0	1000	150	
NB	1	1	1000	150	150
SB	1	1	1000	100	100

3)Need to Revise Channelization? N

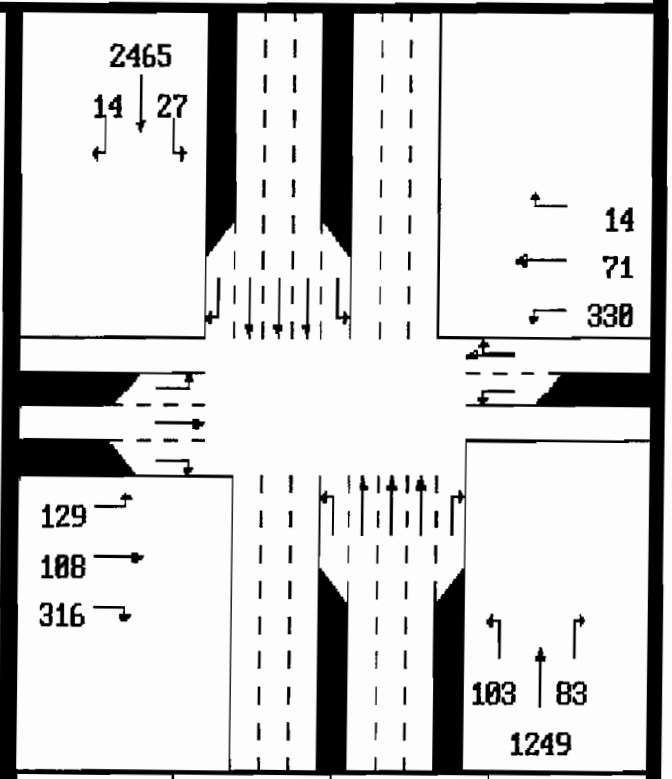
4) Lane Widths (Feet)

	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	
SB	12.0	12.0	12.0	12.0	12.0	



NETSIM Results for Case: BELTAM2 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ & Other Impr AM Peak Version 3.06



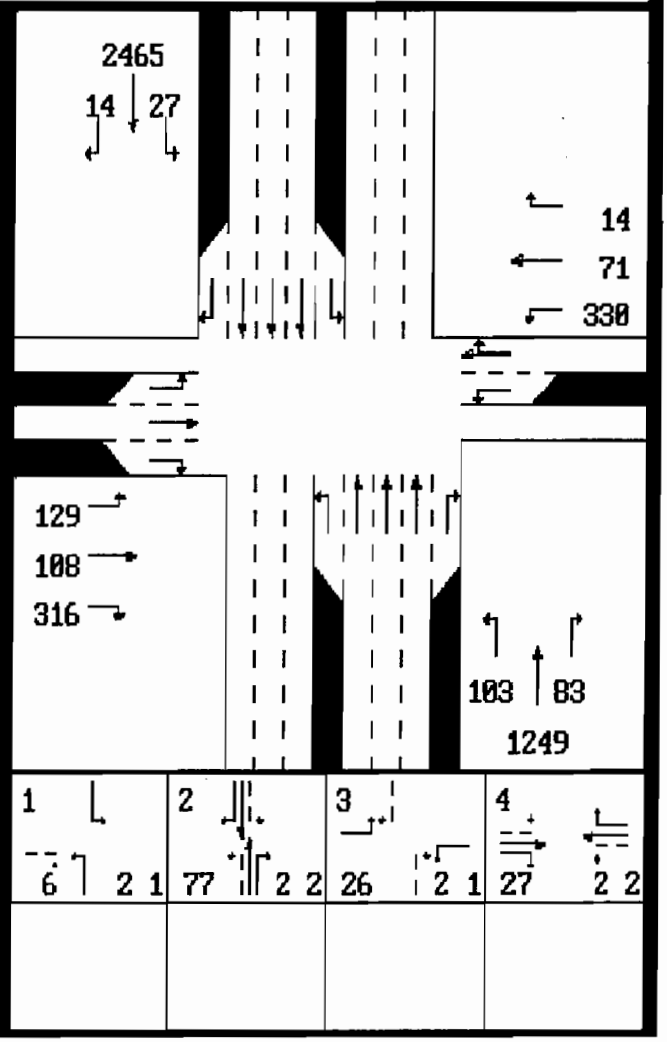
Simulation results indicate that the peak period traffic movements identified by X are oversaturated and cannot be serviced

Approach	Left	Thru	Right
WB	X		
NB	X		

NETSIM Summary for Case: BELTAM2 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ & Other Impr AM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	6/ 10	2.8	7.2
	T	6/ 10	15.7	0.0
	R	8/ 11	3.2	0.0
	All		10.2	7.2
WB	L	23/ 32	1.7	61.1
	TR	3/ 7	6.2	0.0
	All		4.8	61.1
NB	L	20/ 25	0.2	81.3
	T	7/ 9	9.2	0.0
	R	1/ 1	17.5	0.0
	All		7.4	81.3
SB	L	1/ 2	2.2	0.0
	T	13/ 19	14.3	0.0
	R	1/ 3	14.1	0.0
	All		14.2	0.0
Intersect.			9.5	



NETSIM Results for Case: BELTAM2 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ & Other Impr AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	6	10	7.2	16.7	0.0	11:27
	T	6	10	0.0			14:23
	R	8	11	0.0	16.7	33.3	8:39
WB	L	23	32	61.1	83.3	16.7	13:52
	TR	3	7	0.0			1:17
NB	L	20	25	81.3	83.3	0.0	9:14
	T	7	9	0.0			4:29
	R	1	1	0.0	0.0	0.0	4:12
SB	L	1	2	0.0	0.0	16.7	0:16
	T	13	19	0.0			12:49
	R	1	3	0.0	0.0	66.7	0:17

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: BELTAM2 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ & Other Impr AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	2.6	0.1	0.0	12.5	10.0	0.0
WB	3.8	0.2	0.0	6.7	4.2	0.0
NB	8.7	0.9	0.0	7.8	4.0	0.0
SB	10.6	0.7	0.0	11.7	5.0	0.0
All	25.8	1.8	0.0	9.8	4.6	0.0

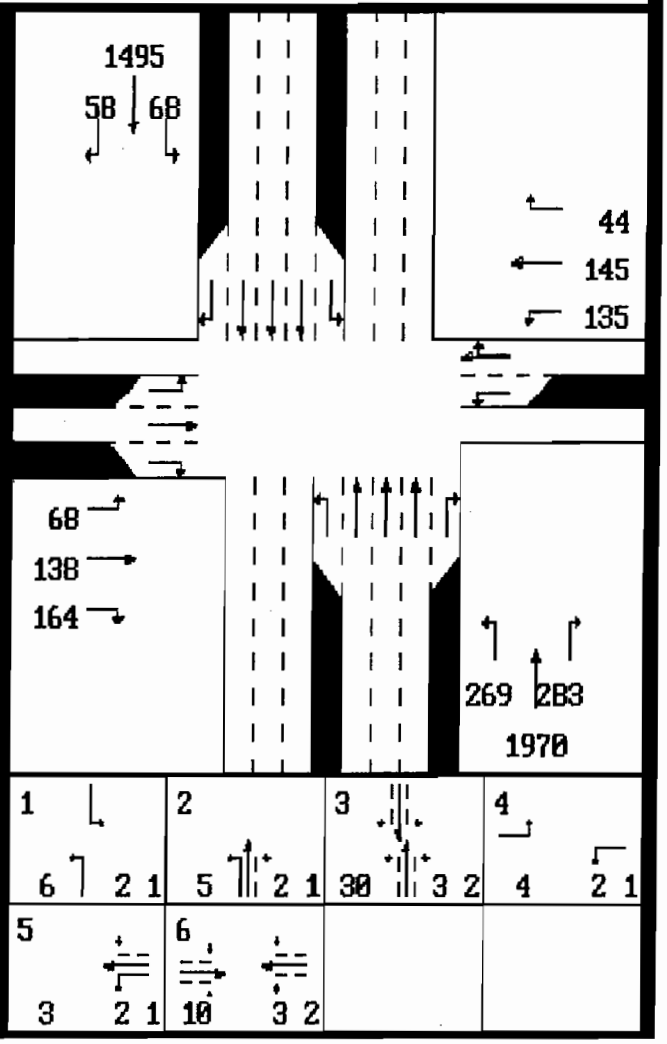
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	134.7	2547.1	321.1	51
WB	188.3	3019.8	443.4	1
NB	480.2	13537.8	1522.3	1
SB	596.5	17927.7	2037.5	0
All	349.9	9258.1	1081.1	

HCM Summary Results for Case: BELTEXPM Beltway Dr /Midway Road

Existing Conditions PM Peak Version 3.06

			- Lane Grp -		- App -	
				Delay	L	Delay	L
	Lane		X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	Lper	0.00				25.3	D
	Lpro	0.05	0.35#	20.8	C		
	T	*0.09	0.61	27.0	D		
	R	0.08	0.55	26.0	D		
WB	Lper	0.00				19.5	C
	Lpro	*0.09	0.46#	16.8	C		
	TR	0.11	0.51	21.5	C		
NB	Lper	0.00				15.0	B
	Lpro	*0.17	0.77#	17.8	C		
	T	0.45	0.89	15.3	C		
	R	0.18	0.37	9.4	B		
SB	Lper	0.00				21.2	C
	Lpro	0.05	0.38#	10.6	B		
	T	*0.37	0.93	21.8	C		
	R	0.02	0.06	11.2	B		
	Int.	0.72	0.85	18.2	C	#L	TOTAL



Input Data for Case: BELTEXPM Beltway Dr /Midway Road

Existing Conditions PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	5	5
Outbound Street	1	1	3	3

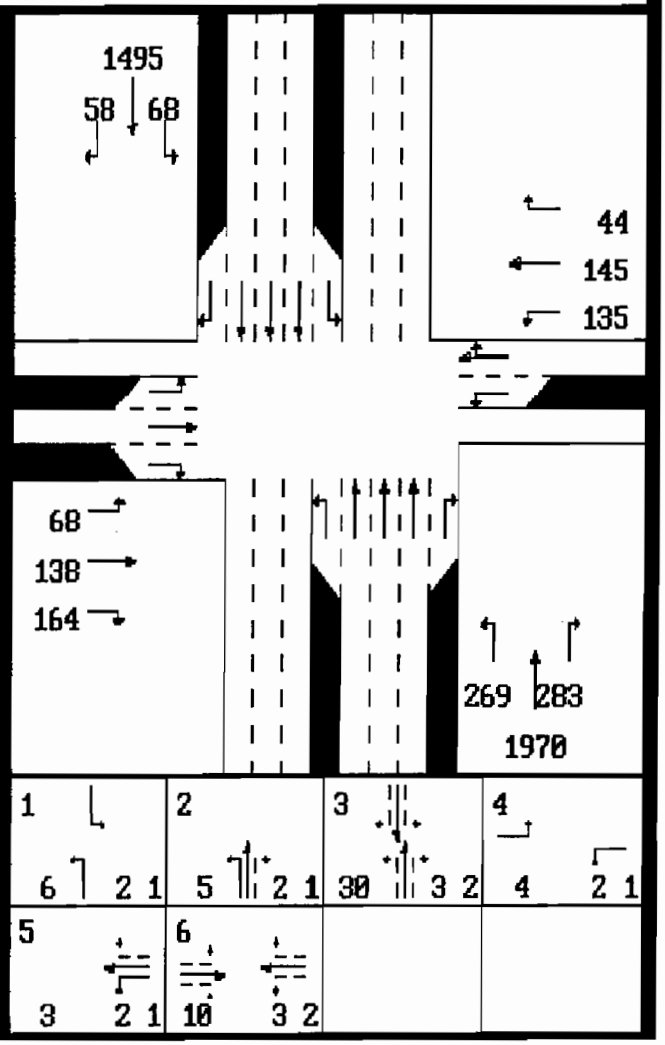
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt	R Pkt
EB	1	1	1000	75	75
WB	1	0	1000	125	
NB	1	1	1000	115	75
SB	1	1	1000	100	100

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

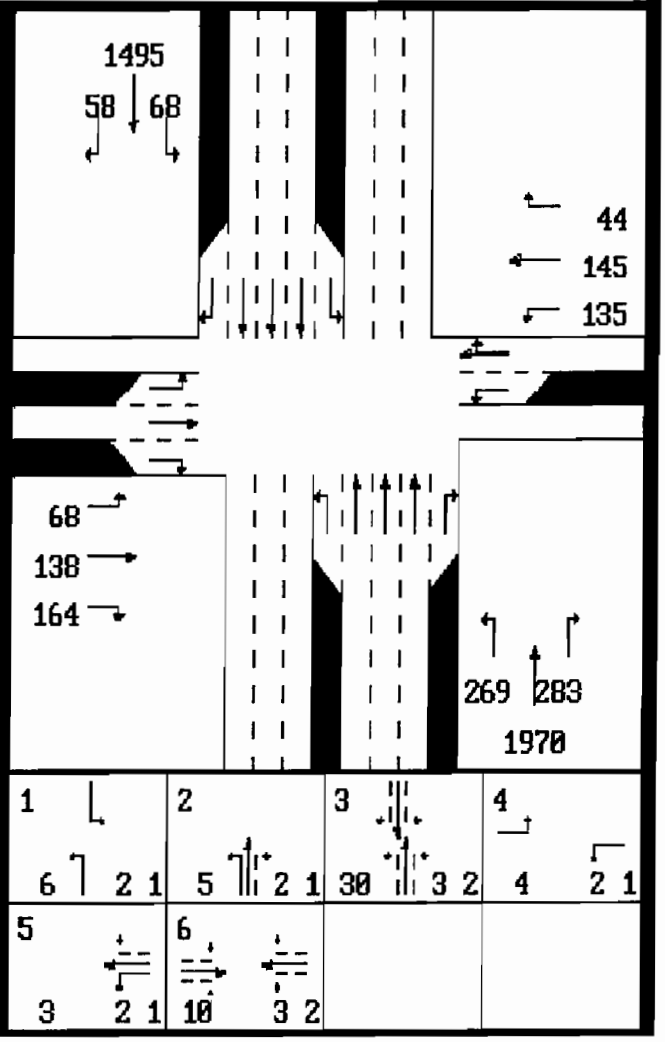
	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	
SB	12.0	12.0	12.0	12.0	12.0	



NETSIM Summary for Case: BELTEXPM Beltway Dr /Midway Road

Existing Conditions PM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	2/ 3	2.4	0.0
	T	3/ 6	18.6	0.0
	R	2/ 4	4.9	0.0
	All		14.9	0.0
WB	L	2/ 4	3.6	0.0
	TR	4/ 6	16.3	0.0
	All		13.8	0.0
NB	L	10/ 14	1.5	35.6
	T	10/ 17	13.7	0.0
	R	4/ 7	5.5	0.0
	All		12.3	35.6
SB	L	4/ 7	1.7	4.3
	T	10/ 12	12.7	0.0
	R	1/ 2	13.3	0.0
	All		12.1	4.3
Intersect.			12.5	



NETSIM Results for Case: BELTEXPM Beltway Dr /Midway Road

Existing Conditions PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	2	3	0.0	0.0	18.2	3:22
	T	3	6	0.0			14:21
	R	2	4	0.0	0.0	18.2	10:08
WB	L	2	4	0.0	0.0	0.0	1:49
	TR	4	6	0.0			4:57
NB	L	10	14	35.6	90.9	36.4	3:56
	T	10	17	0.0			5:25
	R	4	7	0.0	18.2	72.7	5:17
SB	L	4	7	4.3	9.1	36.4	10:10
	T	10	12	0.0			5:20
	R	1	2	0.0	0.0	36.4	0:01

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: BELTEXPM Beltway Dr /Midway Road

Existing Conditions PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.3	0.0	0.0	17.4	0.0	0.0
WB	1.0	0.0	0.0	16.6	0.0	0.0
NB	12.6	0.4	0.0	10.7	4.9	0.0
SB	8.4	0.8	0.0	10.9	4.1	0.0
All	23.4	1.2	0.0	11.4	4.4	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

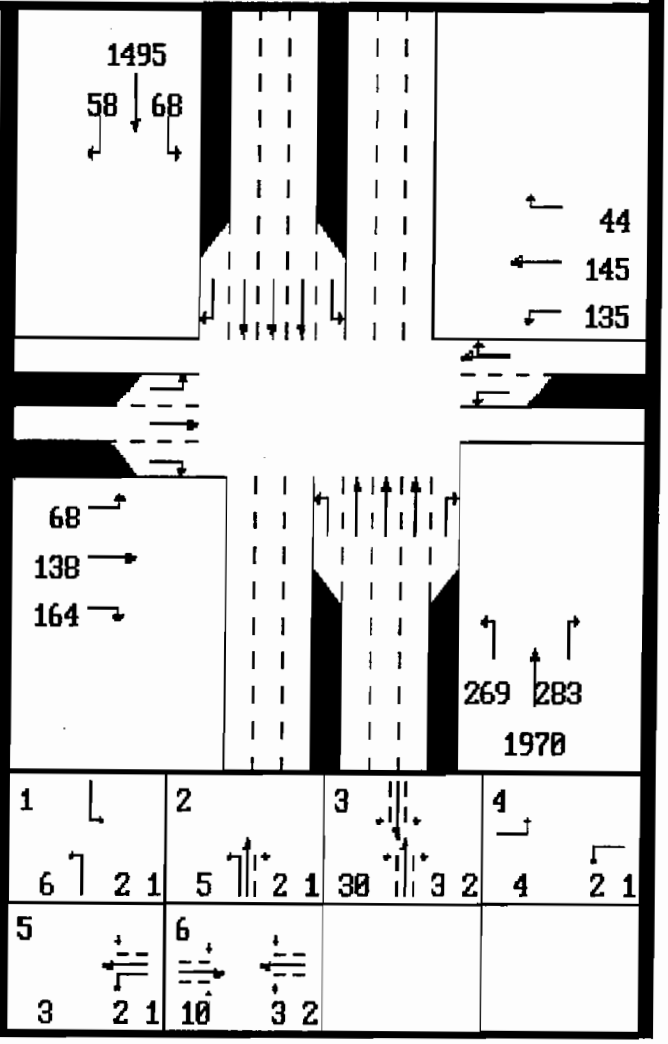
	HC	CO	NOX	RTOR Maneuvers Completed
EB	61.7	940.3	136.9	40
WB	50.3	788.0	105.4	1
NB	696.1	19378.8	2334.6	29
SB	474.8	14135.0	1545.5	5
All	320.7	8810.5	1030.6	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: BELTPM1 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

			- Lane Grp -		- App -	
				Delay	L	Delay	L
	Lane		X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	Lper	0.00				25.3	D
	Lpro	0.05	0.35#	20.8	C		
	T	*0.09	0.61	27.0	D		
	R	0.08	0.55	26.0	D		
WB	Lper	0.00				19.5	C
	Lpro	*0.09	0.46#	16.8	C		
	TR	0.11	0.51	21.5	C		
NB	Lper	0.00				15.0	B
	Lpro	*0.17	0.77#	17.8	C		
	T	0.45	0.89	15.3	C		
	R	0.18	0.37	9.4	B		
SB	Lper	0.00				21.2	C
	Lpro	0.05	0.38#	10.6	B		
	T	*0.37	0.93	21.8	C		
	R	0.02	0.06	11.2	B		
	Int.	0.72	0.85	18.2	C	#L	TOTAL



Input Data for Case: BELTPM1 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	5	5
Outbound Street	1	1	3	3

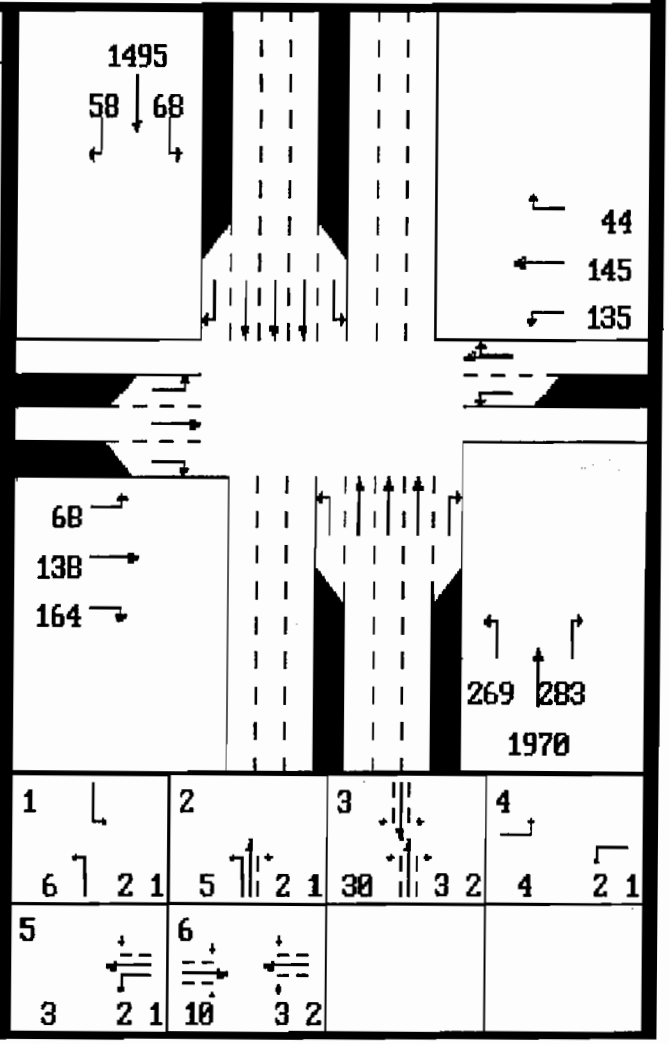
2)

	-Pkt Lanes- Left	Right	--Lane Lengths-- Full L	Pkt	R Pkt
EB	1	1	1000	150	150
WB	1	0	1000	150	
NB	1	1	1000	150	150
SB	1	1	1000	100	100

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

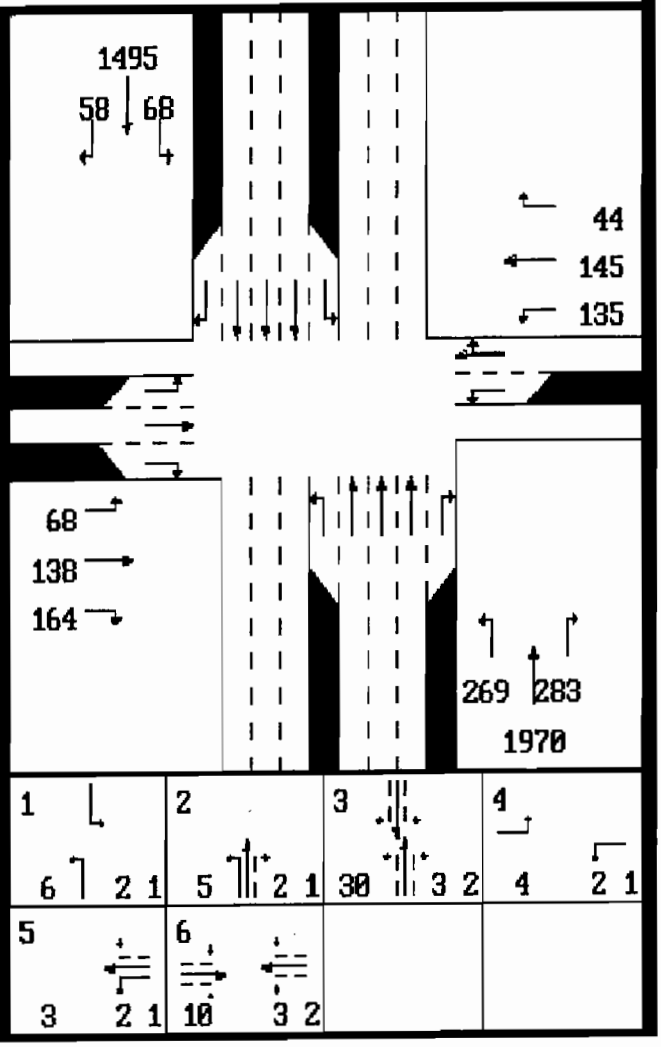
	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0	12.0	
SB	12.0	12.0	12.0	12.0	12.0	



NETSIM Summary for Case: BELTPM1 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	2/ 4	4.5	0.0
	T	3/ 6	18.6	0.0
	R	2/ 4	7.4	0.0
	All		15.2	0.0
WB	L	2/ 4	4.3	0.0
	TR	4/ 6	17.0	0.0
	All		14.3	0.0
NB	L	9/ 13	1.8	13.2
	T	9/ 15	16.2	0.0
	R	3/ 8	7.6	0.0
	All		14.0	13.2
SB	L	5/ 6	1.6	0.0
	T	9/ 12	12.7	0.0
	R	1/ 2	14.1	0.0
	All		12.1	0.0
Intersect.			13.4	



NETSIM Results for Case: BELTPM1 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	2	4	0.0	0.0	0.0	7:24
	T	3	6	0.0			14:21
	R	2	4	0.0	0.0	0.0	10:07
WB	L	2	4	0.0	0.0	0.0	1:47
	TR	4	6	0.0			4:57
NB	L	9	13	13.2	36.4	27.3	3:56
	T	9	15	0.0			12:08
	R	3	8	0.0	0.0	18.2	4:58
SB	L	5	6	0.0	0.0	54.5	8:01
	T	9	12	0.0			5:23
	R	1	2	0.0	0.0	27.3	0:01

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: BELTPM1 Beltway Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.3	0.0	0.0	17.0	0.0	0.0
WB	1.0	0.0	0.0	16.9	0.0	0.0
NB	11.2	0.4	0.0	12.1	4.8	0.0
SB	8.7	0.8	0.0	10.6	4.2	0.0
All	22.2	1.2	0.0	12.0	4.4	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

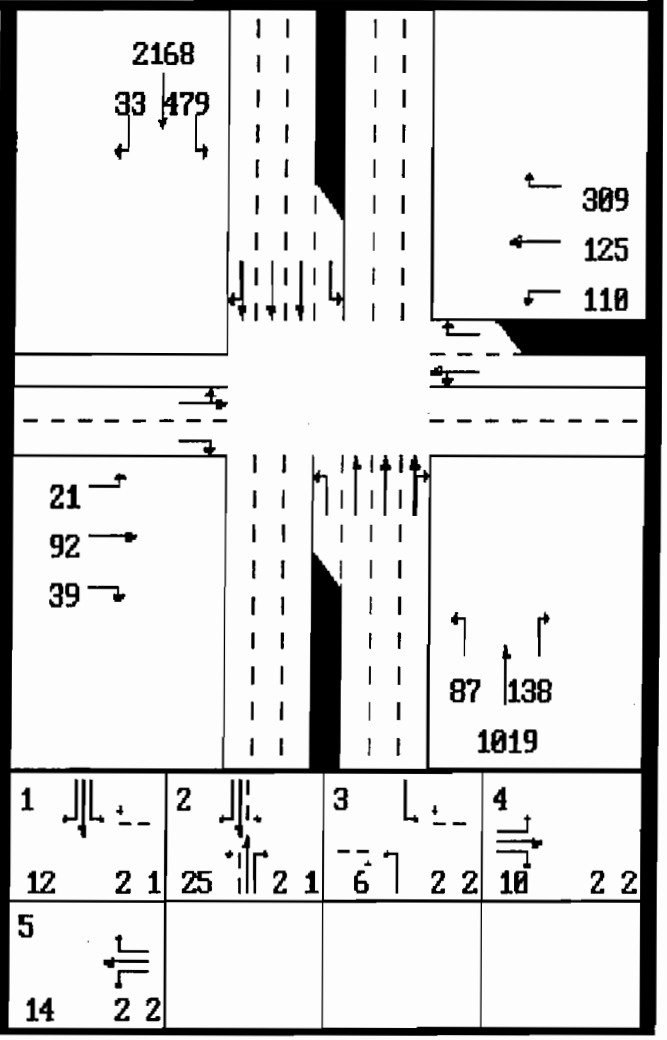
	HC	CO	NOX	RTOR Maneuvers Completed
EB	65.3	1296.1	157.8	41
WB	50.0	852.8	107.2	2
NB	618.3	17518.4	2015.6	28
SB	491.7	15139.0	1630.4	6
All	306.3	8701.6	977.8	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: LINDEXAM Lindberg Dr /Midway Road

Existing Conditions AM Peak Version 3.06

			- Lane Grp -		- App -	
			Delay	L	Delay	L
Lane		X	(sec/	O	(sec/	O
Grp	v/s	v/c	veh)	S	veh)	S
EB LT	*0.09	0.74	35.2	D	31.2	D
R	0.04	0.14	19.0	C		
WB LT	*0.15	0.86	39.8	D	26.0	D
R	0.18	0.42	12.9	B		
NB Lper	*0.29				27.1	D
Lpro	0.01	0.44#	26.6	D		
TR	0.27	0.92	27.1	D		
SB Lper	0.00				26.4	D
Lpro	*0.29	0.94#	33.0	D		
TR	0.47	0.99	25.1	D		
Int.	0.83	0.93	26.7	D	#L	TOTAL



Input Data for Case: LINDEXAM — Lindberg Dr /Midway Road

Existing Conditions — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	2	1	3	3

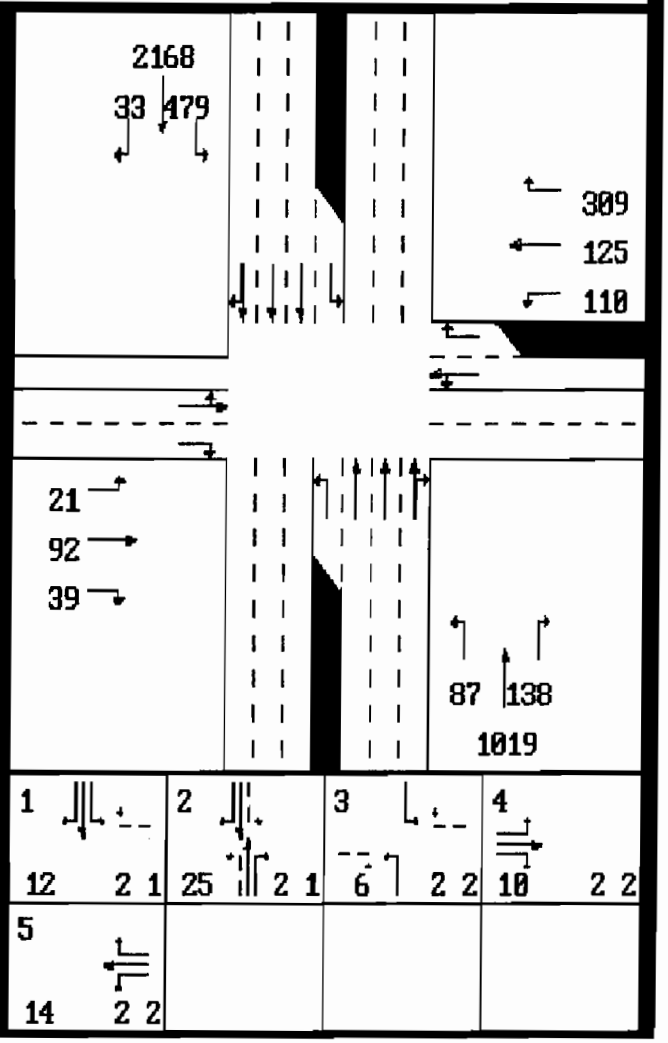
2)

	-Pkt Lanes- Left	Right	—Lane Lengths— Full L	Pkt	R Pkt
EB	0	0	1000		
WB	0	1	1000		125
NB	1	0	1000	160	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

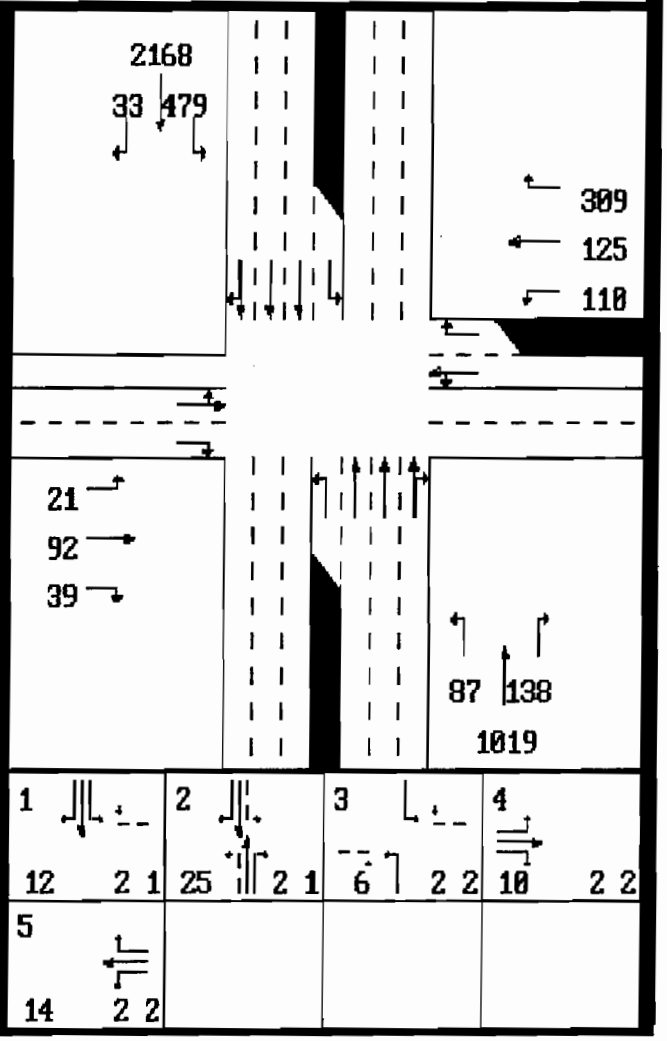
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: LINDEXAM — Lindberg Dr /Midway Road

Existing Conditions — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	6/ 7	5.6	0.0
	R	1/ 1	19.9	0.0
	All		6.9	0.0
WB	LT	5/ 7	16.8	0.0
	R	3/ 4	8.6	0.0
	All		15.5	0.0
NB	L	3/ 4	3.2	0.0
	TR	7/ 10	11.5	0.0
	All		11.1	0.0
SB	L	18/ 24	1.8	49.9
	TR	12/ 25	10.5	0.0
	All		9.2	49.9
Intersect.			10.0	



NETSIM Results for Case: LINDEXAM — Lindberg Dr /Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	6	7	0.0			6:47
	R	1	1	0.0			0:04
WB	LT	5	7	0.0			5:19
	R	3	4	0.0	0.0	18.2	6:15
NB	L	3	4	0.0	0.0	0.0	4:20
	TR	7	10	0.0			12:41
SB	L	18	24	49.9	90.9	0.0	14:23
	TR	12	25	0.0			14:28

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: LINDEXAM Lindberg Dr /Midway Road

Existing Conditions AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.8	0.3	0.0	10.5	5.1	0.0
WB	1.7	0.2	0.0	16.6	9.8	0.0
NB	6.5	0.6	0.0	10.1	4.8	0.0
SB	15.3	0.6	0.0	8.8	4.0	0.0
All	24.3	1.6	0.0	9.7	5.0	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

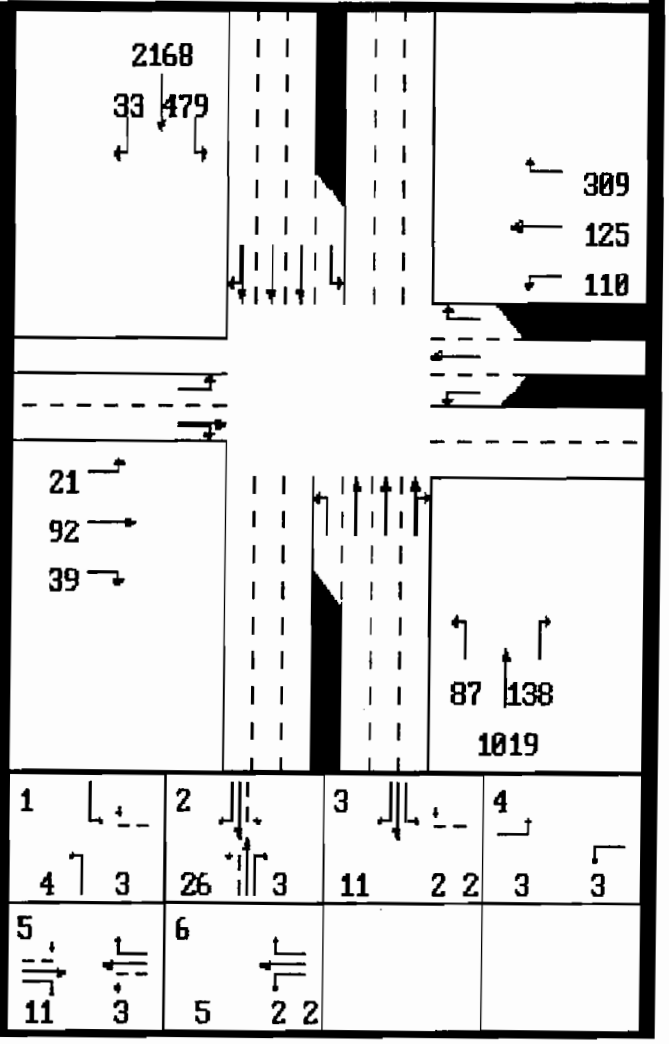
	HC	CO	NOX	RTOR Maneuvers Completed
EB	39.1	539.9	66.9	6
WB	85.5	1559.4	208.8	41
NB	365.3	11036.6	1213.0	20
SB	833.7	22657.2	2760.0	0
All	330.9	8948.3	1062.2	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: LINDCMAM Lindberg Dr /Midway Road

Existing Traffic w/CMAQ Improv. AM Peak Version 3.06

			- Lane Grp -		- App -	
				Delay	L	Delay	L
	Lane		X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	Lper	0.00				36.4	D
	Lpro	0.02	0.14#	21.1	C		
	TR	*0.11	0.81	38.9	D		
WB	Lper	0.00				14.6	B
	Lpro	*0.07	0.36#	20.6	C		
	T	0.08	0.32	18.7	C		
	R	0.18	0.38	9.9	B		
NB	Lper	0.05				20.6	C
	Lpro	0.05	0.56#	15.9	C		
	TR	*0.27	0.83	20.9	C		
SB	Lper	0.00				20.1	C
	Lpro	*0.29	1.00#	43.7	E		
	TR	0.47	0.91	15.5	C		
	Int.	0.75	0.88	20.3	C	#L	TOTAL



Input Data for Case: LINDCMAM — Lindberg Dr /Midway Road

Existing Traffic w/CMAQ Improv. — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	3	4	4
Outbound Street	2	1	3	3

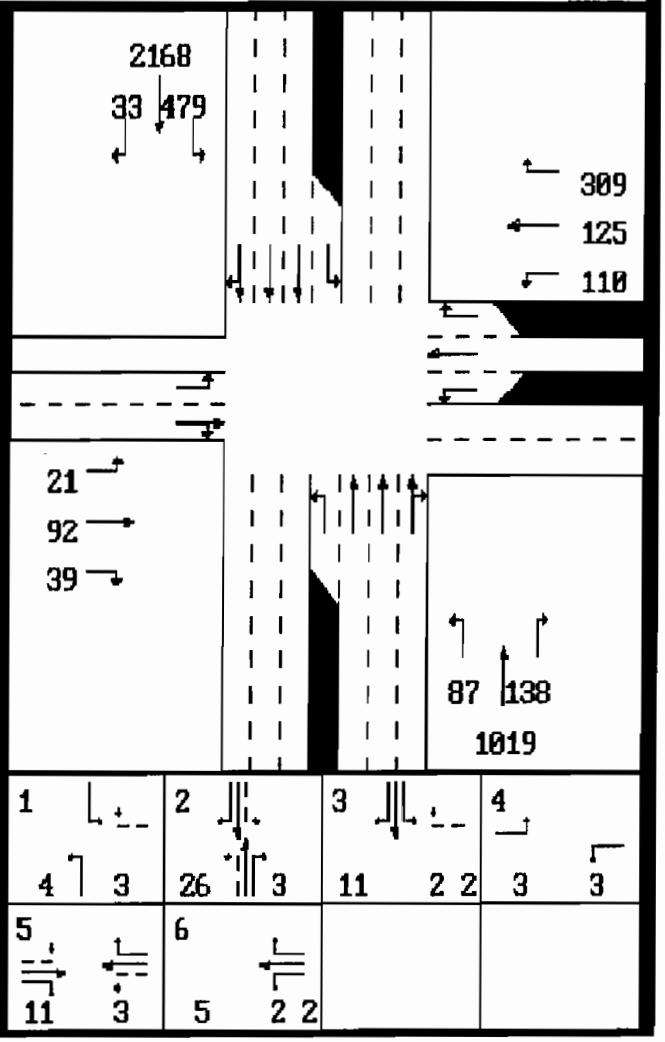
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt	R Pkt
EB	0	0	1000		
WB	1	1	1000	125	125
NB	1	0	1000	160	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

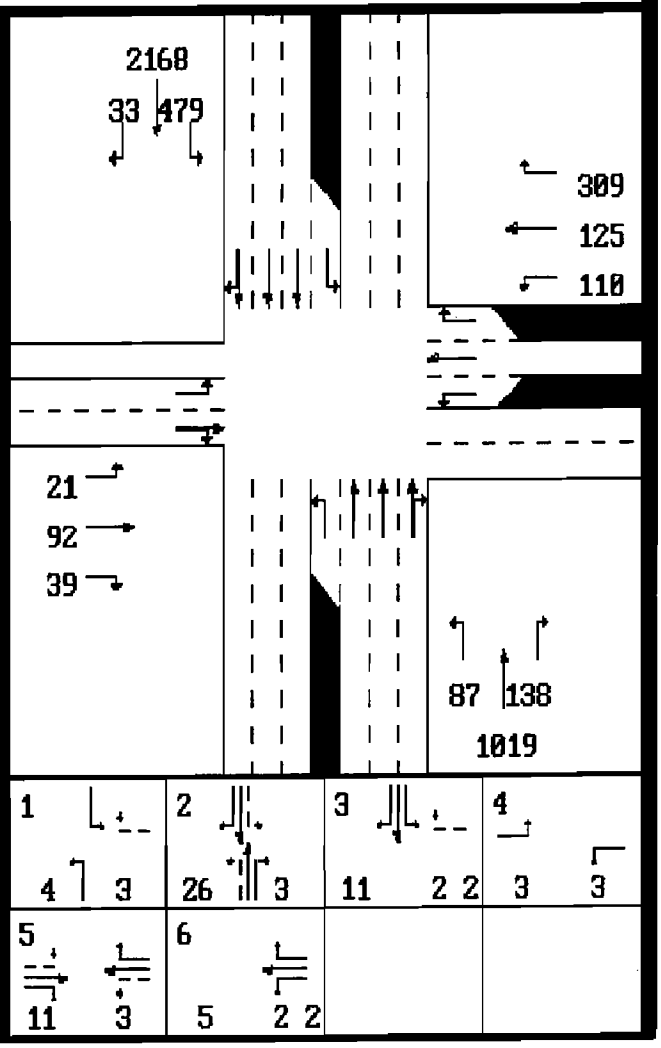
	Median	2	3	4	5	6
EB		12.0	12.0			
WB		12.0	12.0	12.0		
NB		12.0	12.0	12.0	12.0	
SB		12.0	12.0	12.0	12.0	



NETSIM Summary for Case: LINDCMAM — Lindberg Dr /Midway Road

Existing Traffic w/CMAQ Improv. — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	1/ 2	14.9	0.0
	TR	3/ 4	12.4	0.0
	All		12.9	0.0
WB	L	1/ 3	3.7	0.0
	T	2/ 5	22.5	0.0
	R	3/ 4	7.9	0.0
	All		17.6	0.0
NB	L	3/ 5	2.5	0.0
	TR	7/ 9	12.5	0.0
	All		11.8	0.0
SB	L	19/ 30	1.9	45.0
	TR	10/ 14	12.2	0.0
	All		10.5	45.0
Intersect.			11.5	



NETSIM Results for Case: LINDCMAM — Lindberg Dr /Midway Road

Existing Traffic w/CMAQ Improv. — AM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	1	2	0.0			0:35
	TR	3	4	0.0			11:31
WB	L	1	3	0.0	0.0	0.0	4:49
	T	2	5	0.0			8:48
	R	3	4	0.0	0.0	0.0	1:51
NB	L	3	5	0.0	0.0	0.0	11:31
	TR	7	9	0.0			11:32
SB	L	19	30	45.0	90.9	0.0	13:55
	TR	10	14	0.0			9:26

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: LINDCMAM Lindberg Dr /Midway Road

Existing Traffic w/CMAQ Improv. AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.5	0.2	0.0	16.7	7.3	0.0
WB	1.6	0.2	0.0	18.1	8.8	0.0
NB	6.4	0.7	0.0	10.4	4.1	0.0
SB	14.3	0.5	0.0	9.4	4.1	0.0
All	22.8	1.6	0.0	10.4	5.1	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

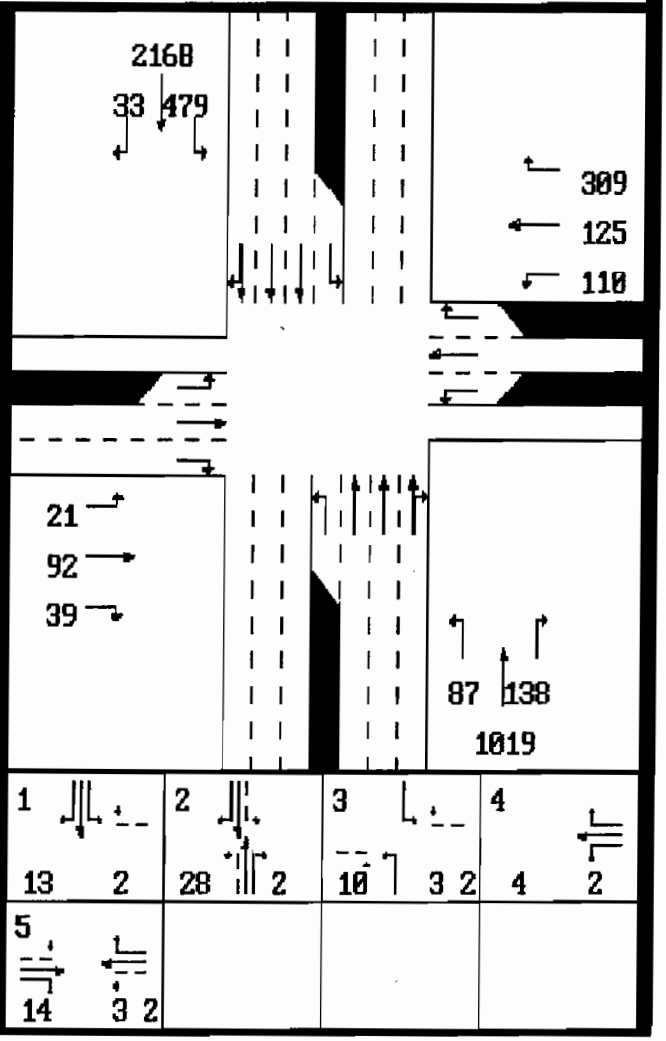
	HC	CO	NOX	RTOR Maneuvers Completed
EB	24.0	339.7	42.4	6
WB	79.7	1607.7	203.4	36
NB	359.4	11025.0	1197.3	12
SB	805.4	23967.4	2757.1	0
All	317.1	9235.0	1050.1	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: LNDAMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements AM Peak Version 3.06

	Lane Grp	v/s	X v/c	Lane Grp Delay (sec/veh)	L O S	App Delay (sec/veh)	App L O S
EB	L	0.03	0.15	21.9	C	21.3	C
	T	0.08	0.41	23.5	C		
	R	0.03	0.10	15.8	C		
WB	Lper	*0.08				13.5	B
	Lpro	*0.04	0.50#	22.1	C		
	T	0.08	0.30	19.4	C		
	R	0.20	0.35	7.3	B		
NB	Lper	*0.32				22.5	C
	Lpro	0.01	0.30#	21.3	C		
	TR	0.27	0.84	22.6	C		
SB	Lper	0.00				19.0	C
	Lpro	*0.29	0.79#	20.3	C		
	TR	0.47	0.94	18.7	C		
	Int.	0.72	0.77	19.5	C	#L TOTAL	



Input Data for Case: LNDAMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements AM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	3	4	4
Outbound Street	1	1	3	3

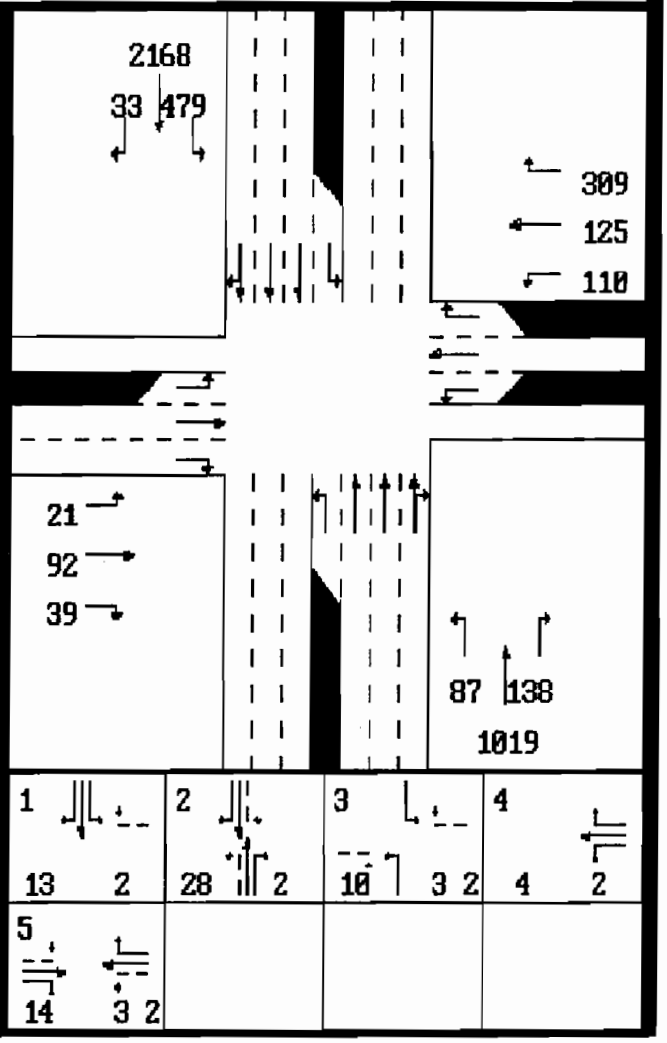
2)

	-Pkt Lanes- Left	Right	—Lane Lengths— Full L	Pkt L	Pkt R
EB	1	0	1000	100	
WB	1	1	1000	100	150
NB	1	0	1000	160	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

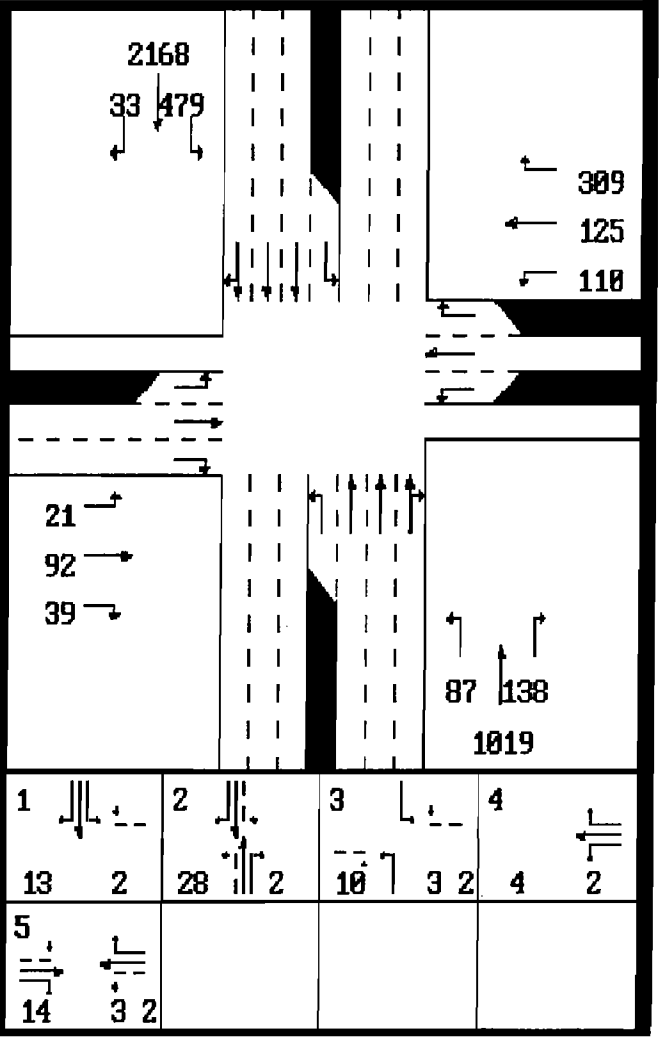
	Median	2	3	4	5	6
EB		12.0	12.0	12.0		
WB		12.0	12.0	12.0		
NB		12.0	12.0	12.0	12.0	
SB		12.0	12.0	12.0	12.0	



NETSIM Summary for Case: LNDAMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements AM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	1/ 2	3.2	0.0
	T	2/ 4	15.5	0.0
	R	1/ 2	19.6	0.0
	All		14.5	0.0
WB	L	2/ 4	2.8	0.0
	T	2/ 4	21.8	0.0
	R	3/ 5	9.0	0.0
	All		16.8	0.0
NB	L	2/ 4	5.0	0.0
	TR	6/ 10	12.3	0.0
	All		12.1	0.0
SB	L	8/ 14	3.3	7.9
	TR	8/ 11	16.9	0.0
	All		14.8	7.9
Intersect.			14.1	



NETSIM Results for Case: LNDAMREC Lindberg Dr /Midway Road
Exist. Traffic w/Other Improvements AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	1	2	0.0	0.0	0.0	0:57
	T	2	4	0.0			5:30
	R	1	2	0.0			3:52
WB	L	2	4	0.0	0.0	0.0	5:19
	T	2	4	0.0			8:15
	R	3	5	0.0	0.0	0.0	2:17
NB	L	2	4	0.0	0.0	0.0	4:15
	TR	6	10	0.0			14:02
SB	L	8	14	7.9	27.3	9.1	5:15
	TR	8	11	0.0			14:31

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: LNDAMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.5	0.2	0.0	18.6	7.6	0.0
WB	1.6	0.2	0.0	17.4	9.3	0.0
NB	6.2	0.6	0.0	10.5	4.4	0.0
SB	11.2	0.4	0.0	12.2	5.5	0.0
All	19.5	1.4	0.0	12.3	5.8	0.0

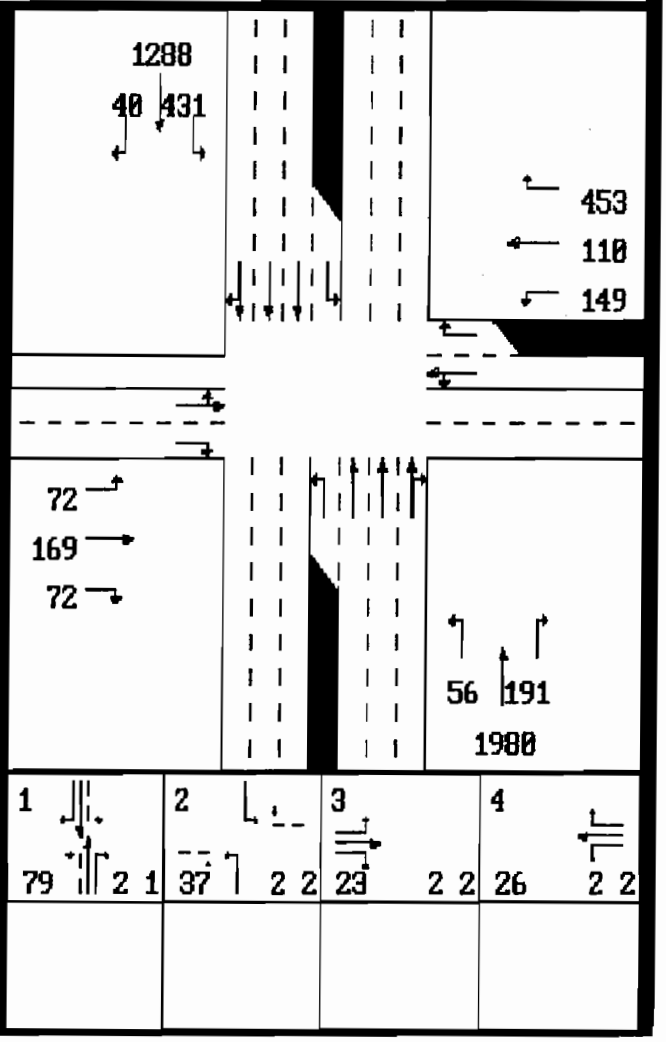
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	21.7	323.2	40.5	3
WB	82.7	1722.4	210.7	22
NB	349.1	10605.7	1168.6	19
SB	625.3	17997.0	2110.7	0
All	269.7	7662.1	882.6	

HCM Summary Results for Case: LINDEXPM Lindberg Dr /Midway Road

Existing Conditions PM Peak Version 3.06

			- Lane Grp -		- App -	
			Delay	L	Delay	L
	Lane	X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	LT	*0.15	1.13	154.8	F	148.7	F
	R	0.01	0.02	28.2	D		
WB	LT	*0.17	1.16	167.7	F	95.2	F
	R	0.30	0.84	47.4	E		
NB	Lper	0.44				73.8	F
	Lpro	0.00	0.13#	24.8	C		
	TR	*0.47	1.08	74.9	F		
SB	Lper	0.44				45.2	E
	Lpro	*0.24	1.05#	95.2	F		
	TR	0.28	0.65	30.4	D		
	Int.	1.04	1.12	70.4	F	#L	TOTAL



Input Data for Case: LINDEXPM — Lindberg Dr /Midway Road

Existing Conditions — PM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	2	1	3	3

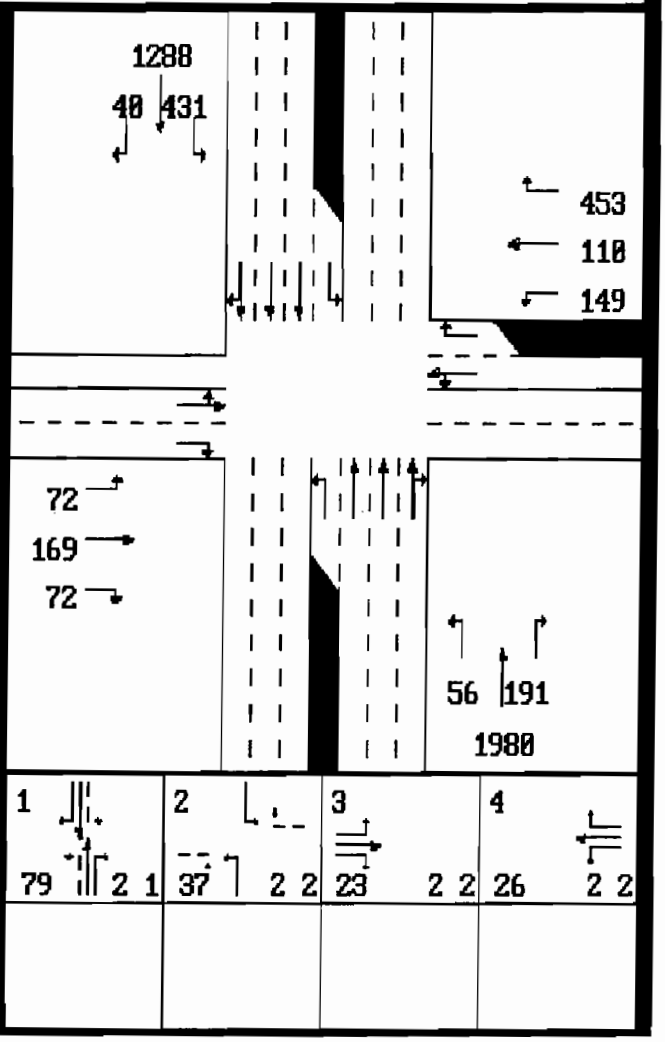
2)

	-Pkt Lanes-		—Lane Lengths—		
	Left	Right	Full L	Pkt	R Pkt
EB	0	0	1000		
WB	0	1	1000		125
NB	1	0	1000	160	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

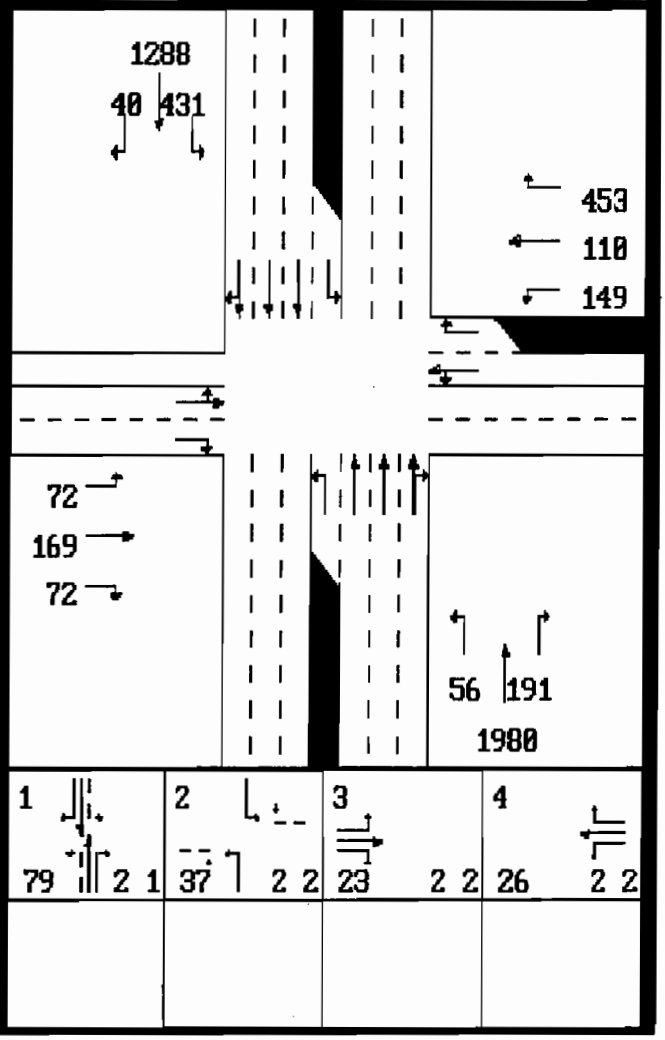
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: LINDEXPM — Lindberg Dr /Midway Road

Existing Conditions — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	23/ 33	2.2	0.0
	R	1/ 2	23.3	0.0
	All		2.8	0.0
WB	LT	15/ 27	3.5	18.0
	R	26/ 35	3.0	24.6
	All		3.5	24.6
NB	L	2/ 3	6.4	0.0
	TR	19/ 32	7.3	0.0
	All		7.3	0.0
SB	L	24/ 34	1.5	48.4
	TR	12/ 17	8.4	0.0
	All		7.2	48.4
Intersect.			5.8	



NETSIM Results for Case: LINDEXPM — Lindberg Dr /Midway Road

Existing Conditions — PM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	23	33	0.0			14:37
	R	1	2	0.0			2:08
WB	LT	15	27	18.0			14:39
	R	26	35	24.6	100.0	100.0	11:11
NB	L	2	3	0.0	0.0	80.0	5:20
	TR	19	32	0.0			10:08
SB	L	24	34	48.4	100.0	20.0	14:13
	TR	12	17	0.0			12:18

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: LINDEXPM — Lindberg Dr /Midway Road

Existing Conditions — PM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	3.0	0.1	0.0	5.0	3.3	0.0
WB	7.1	0.3	0.0	4.6	2.8	0.0
NB	14.6	0.4	0.0	7.7	3.7	0.0
SB	11.4	0.8	0.0	7.5	3.7	0.0
All	36.2	1.6	0.0	6.8	3.5	0.0

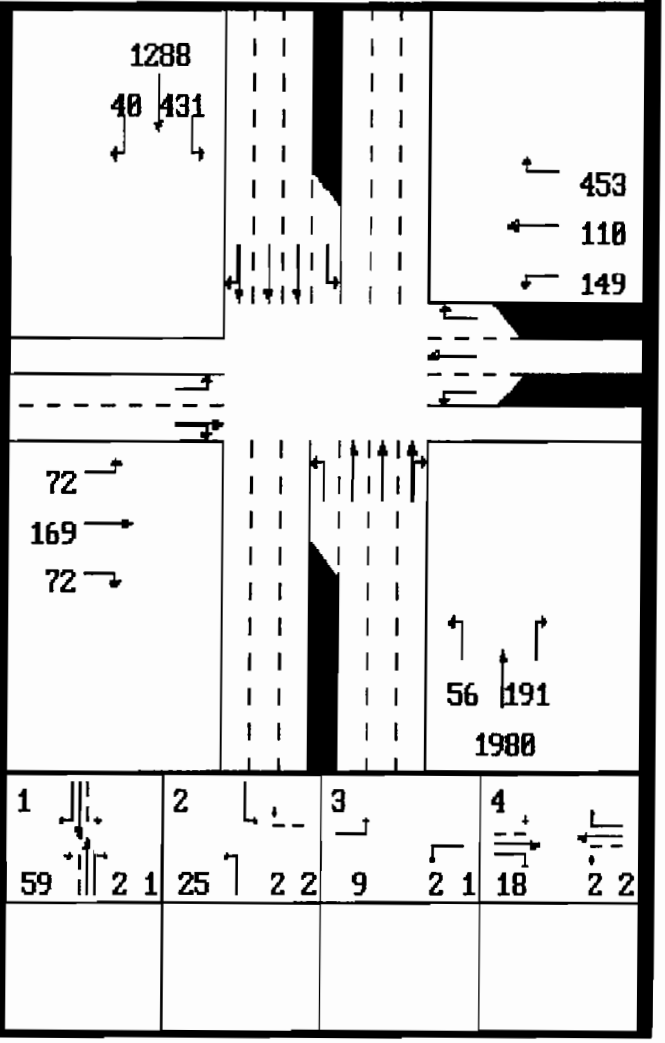
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	146.3	1780.9	222.3	10
WB	339.3	5778.5	866.7	58
NB	766.7	18595.0	2376.4	2
SB	632.6	17947.1	2035.1	1
All	471.2	11025.4	1375.1	

HCM Summary Results for Case: LINDPM1 Lindberg Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

			- Lane Grp - Delay	L	- App - Delay	L
Lane Grp	v/s	X v/c	(sec/ veh)	O S	(sec/ veh)	O S
EB Lper	0.00				60.9	F
Lpro	0.05	0.32#	28.7	D		
TR	0.15	0.96	71.1	F		
WB Lper	0.16				45.1	E
Lpro	*0.07	0.97#	76.0	F		
T	0.07	0.47	37.8	D		
R	*0.30	0.84	35.5	D		
NB Lper	0.40				35.2	D
Lpro	0.00	0.13#	13.1	B		
TR	*0.47	1.00	35.7	D		
SB Lper	0.47				28.4	D
Lpro	0.23	0.99#	61.1	F		
TR	0.28	0.60	18.7	C		
Int.	0.85	0.91	35.7	D	#L TOTAL	



Input Data for Case: LINDPM1 Lindberg Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	3	4	4
Outbound Street	1	1	3	3

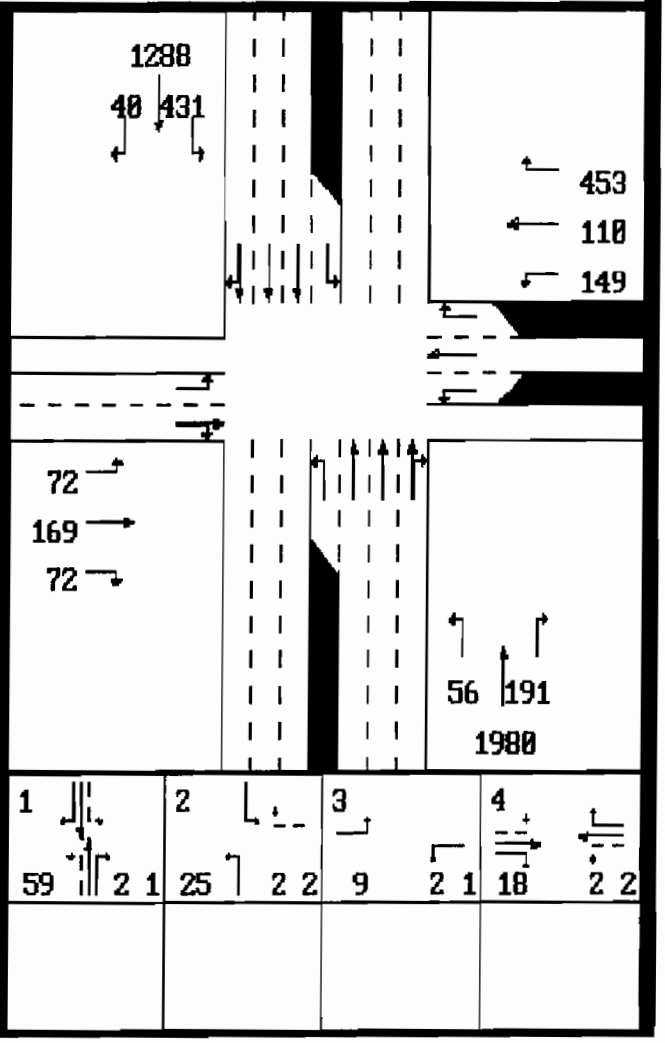
2)

	-Pkt Lanes-		—Lane Lengths—		
	Left	Right	Full L	Pkt	R Pkt
EB	0	0	1000		
WB	1	1	1000	125	125
NB	1	0	1000	160	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

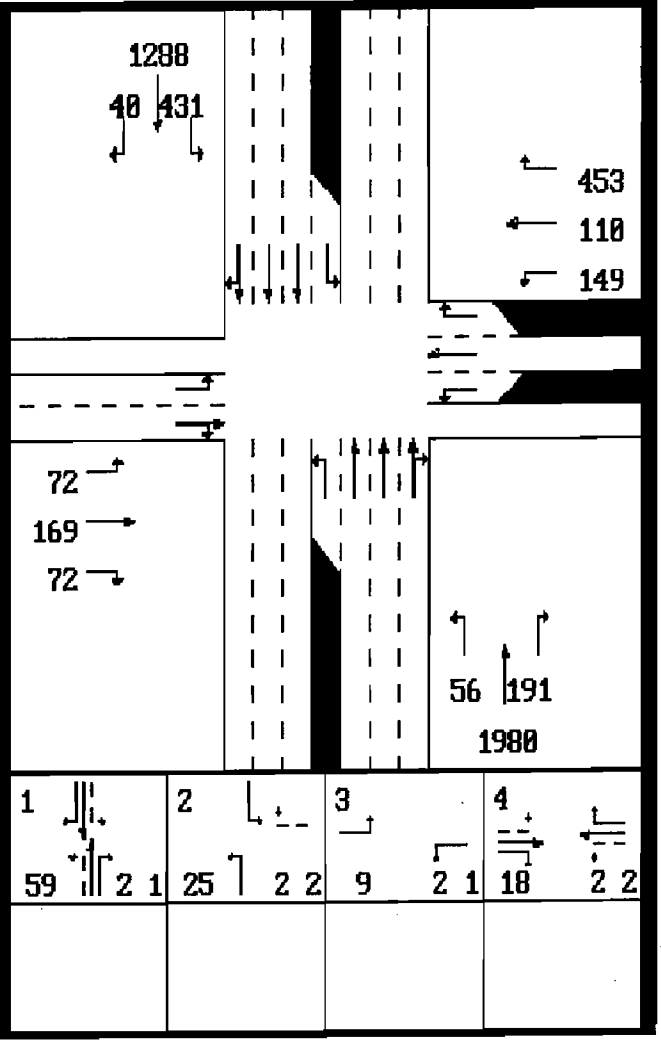
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0	12.0			
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: LINDPM1 Lindberg Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	2/ 4	10.4	0.0
	TR	12/ 16	4.8	0.0
	All		5.6	0.0
WB	L	4/ 6	2.1	5.6
	T	3/ 7	18.5	0.0
	R	7/ 11	4.4	0.0
	All		12.2	5.6
NB	L	1/ 2	11.5	0.0
	TR	12/ 24	11.5	0.0
	All		11.5	0.0
SB	L	21/ 29	1.6	51.1
	TR	8/ 13	10.7	0.0
	All		8.8	51.1
Intersect.			9.9	



NETSIM Results for Case: LINDPM1 Lindberg Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	2	4	0.0			10:46
	TR	12	16	0.0			13:12
WB	L	4	6	5.6	14.3	42.9	2:14
	T	3	7	0.0			13:08
	R	7	11	0.0	57.1	28.6	14:47
NB	L	1	2	0.0	0.0	28.6	4:21
	TR	12	24	0.0			10:07
SB	L	21	29	51.1	100.0	0.0	6:26
	TR	8	13	0.0			11:23

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: LINDPM1 Lindberg Dr /Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.9	0.0	0.0	8.7	19.2	0.0
WB	2.9	0.1	0.0	13.9	13.6	0.0
NB	10.8	0.4	0.0	10.6	4.4	0.0
SB	10.2	0.7	0.0	8.4	3.9	0.0
All	25.9	1.2	0.0	10.0	4.9	0.0

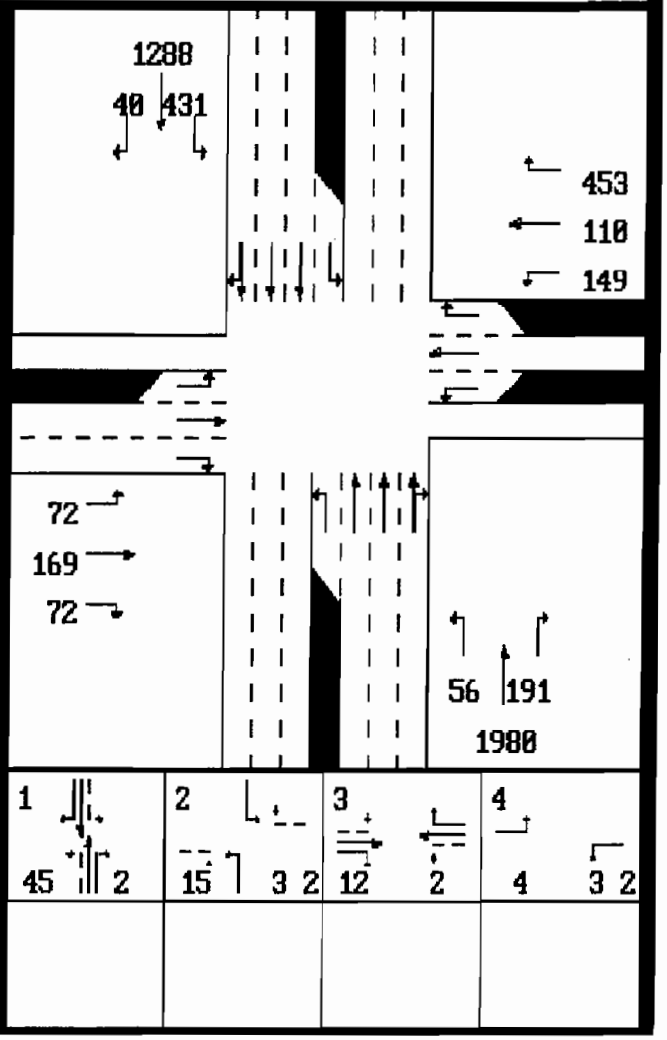
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	91.3	1208.7	159.1	0
WB	150.0	2783.0	370.1	70
NB	587.3	15608.7	1886.1	7
SB	572.4	17229.4	1895.1	1
All	350.2	9207.4	1077.6	

HCM Summary Results for Case: LNDPMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements PM Peak Version 3.06

				- Lane Grp - Delay	L	- App - Delay	L
	Lane Grp	v/s	X v/c	(sec/ veh)	O S	(sec/ veh)	O S
EB	Lper	0.10				34.9	D
	Lpro	0.00	0.30#	24.6	C		
	T	0.10	0.85	46.6	E		
	R	0.05	0.13	15.4	C		
WB	Lper	0.12				30.4	D
	Lpro	*0.06	0.70#	33.2	D		
	T	0.07	0.59	31.2	D		
	R	*0.29	0.85	29.1	D		
NB	Lper	0.37				22.1	C
	Lpro	0.00	0.13#	8.3	B		
	TR	0.48	0.97	22.5	C		
SB	Lper	*0.49				20.7	C
	Lpro	0.22	0.98#	48.1	E		
	TR	0.28	0.58	12.7	B		
	Int.	0.84	0.98	23.5	C	#L TOTAL	



Input Data for Case: LNDPMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	3	4	4
Outbound Street	1	1	3	3

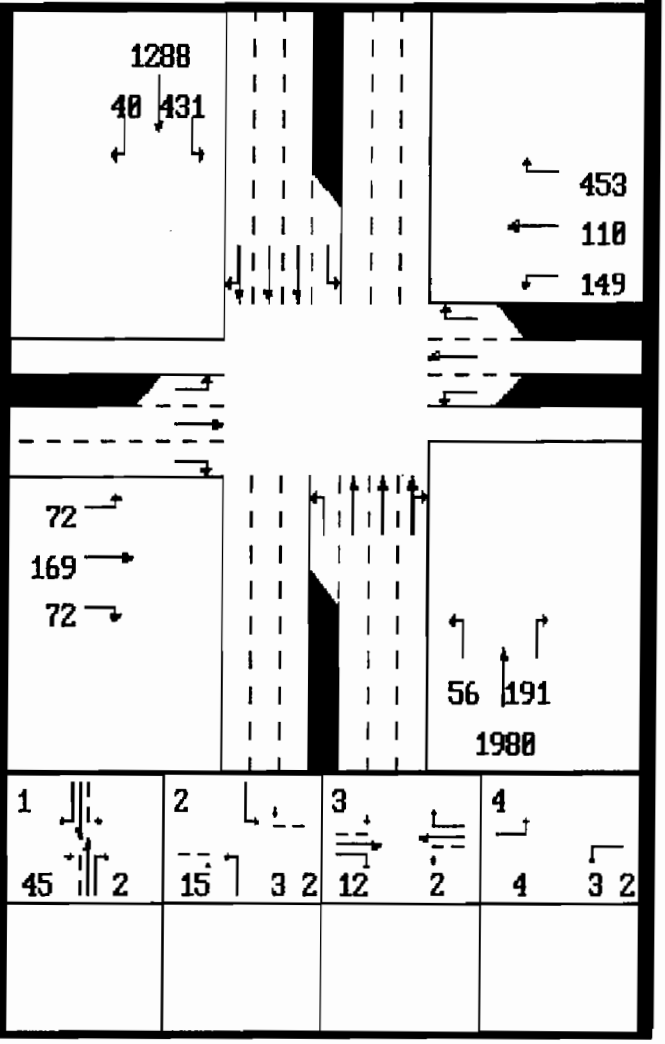
2)

	-Pkt Lanes- Left	Right	—Lane Lengths— Full L	Pkt	R Pkt
EB	1	0	1000	100	
WB	1	1	1000	100	150
NB	1	0	1000	160	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

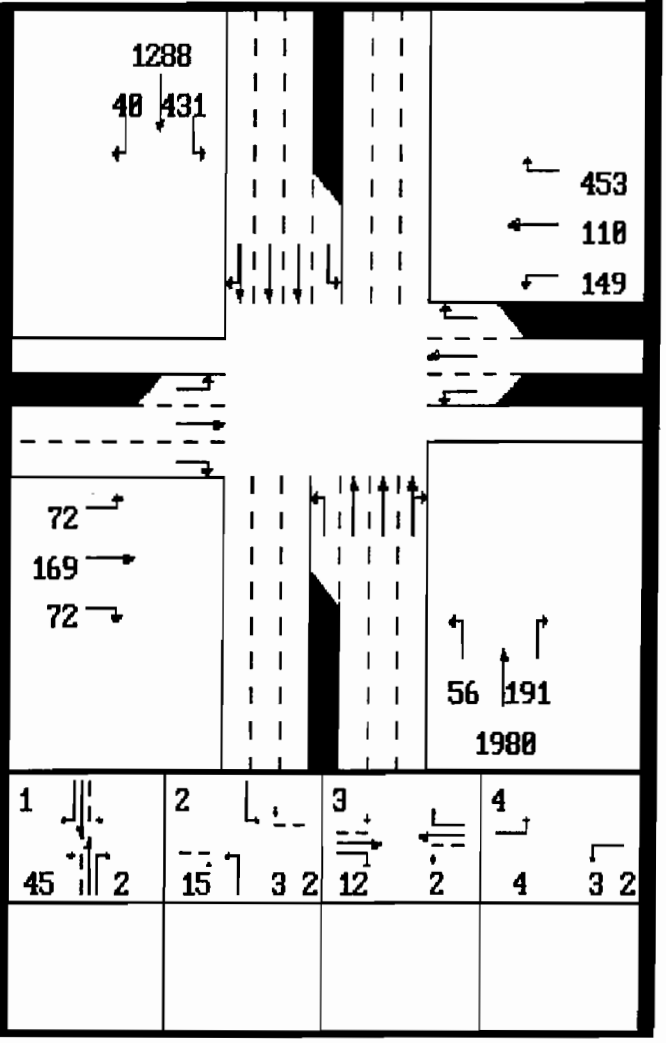
	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0	12.0			
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: LNDPMREC — Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	L	2/ 4	2.6	0.0
	T	6/ 8	9.2	0.0
	R	1/ 2	21.1	0.0
	All		9.6	0.0
WB	L	5/ 10	1.0	16.2
	T	3/ 6	19.2	0.0
	R	6/ 10	5.0	0.0
	All		11.4	16.2
NB	L	0/ 3	10.9	0.0
	TR	6/ 12	17.2	0.0
	All		17.2	0.0
SB	L	24/ 35	1.4	57.9
	TR	7/ 13	10.2	0.0
	All		8.4	57.9
Intersect.			11.6	



NETSIM Results for Case: LNDPMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	L	2	4	0.0	0.0	40.0	3:34
	T	6	8	0.0			2:10
	R	1	2	0.0			0:01
WB	L	5	10	16.2	50.0	0.0	14:08
	T	3	6	0.0			13:42
	R	6	10	0.0	0.0	10.0	14:51
NB	L	0	3	0.0	0.0	0.0	4:45
	TR	6	12	0.0			10:12
SB	L	24	35	57.9	90.0	0.0	9:16
	TR	7	13	0.0			9:38

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: LNDPMREC Lindberg Dr /Midway Road

Exist. Traffic w/Other Improvements PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.3	0.0	0.0	13.1	9.3	0.0
WB	3.1	0.1	0.0	13.1	13.9	0.0
NB	8.6	0.3	0.0	13.4	4.8	0.0
SB	10.3	0.8	0.0	8.3	3.3	0.0
All	23.2	1.3	0.0	11.1	4.5	0.0

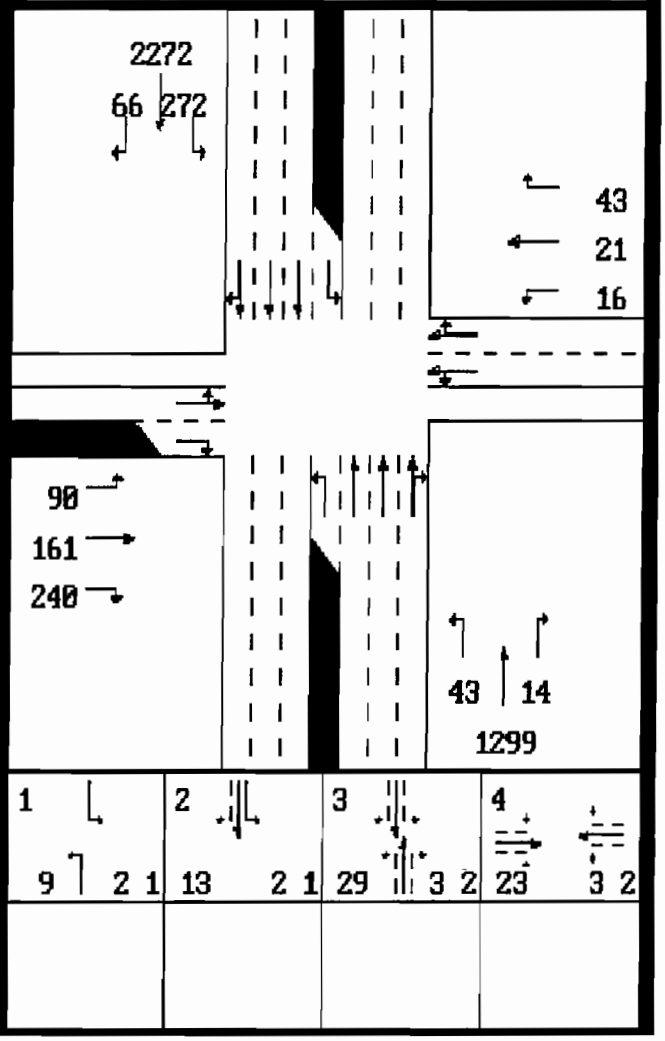
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	62.2	940.9	119.2	11
WB	160.0	3102.3	401.0	68
NB	468.7	13302.2	1572.5	5
SB	568.9	16565.6	1848.8	2
All	314.9	8477.8	985.4	

HCM Summary Results for Case: PROTEXAM Proton Drive/Midway Road

Existing Conditions AM Peak Version 3.06

			- Lane Grp - Delay	L	- App - Delay	L
Lane Grp	v/s	X v/c	(sec/ veh)	O S	(sec/ veh)	O S
EB LT	*0.18	0.64	23.9	C	23.5	C
R	0.17	0.60	23.1	C		
WB LTR	0.04	0.15	18.6	C	18.6	C
NB Lper	0.00				22.1	C
Lpro	*0.03	0.18#	12.5	B		
TR	0.29	0.83	22.4	C		
SB Lper	0.00				17.6	C
Lpro	0.16	0.50#	11.5	B		
TR	*0.49	0.94	18.3	C		
Int.	0.70	0.77	19.6	C	#L TOTAL	



Input Data for Case: PROTEXAM — Proton Drive/Midway Road

Existing Conditions — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	1	1	3	3

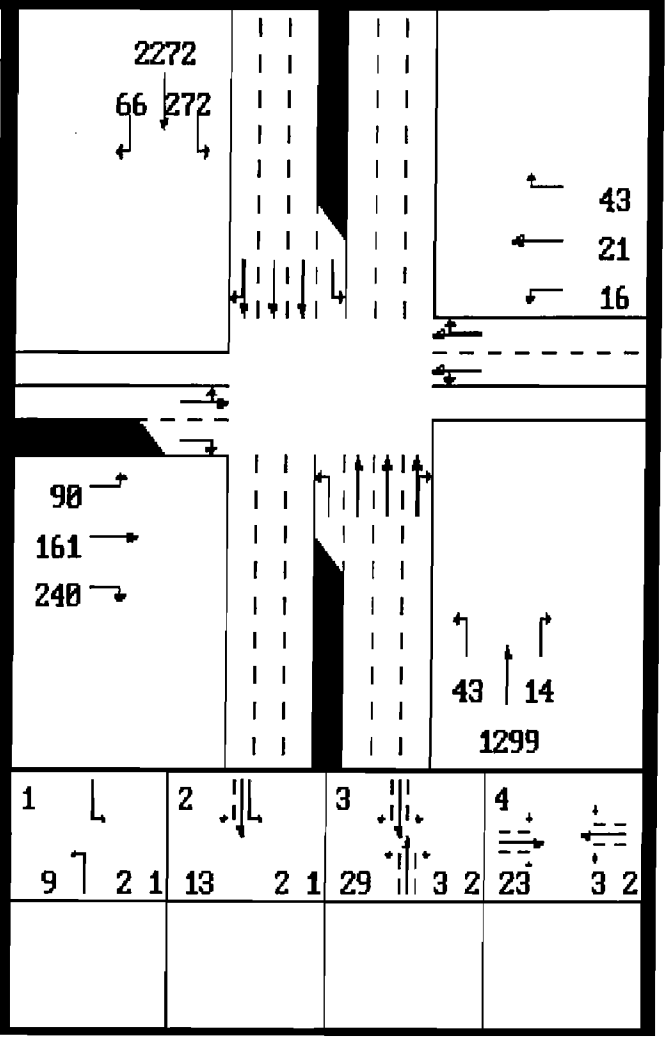
2)

	-Pkt Lanes- Left	Right	—Lane Lengths— Full L	Pkt	R Pkt
EB	0	1	600		80
WB	0	0	600		
NB	1	0	1000	85	
SB	1	0	1000	100	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

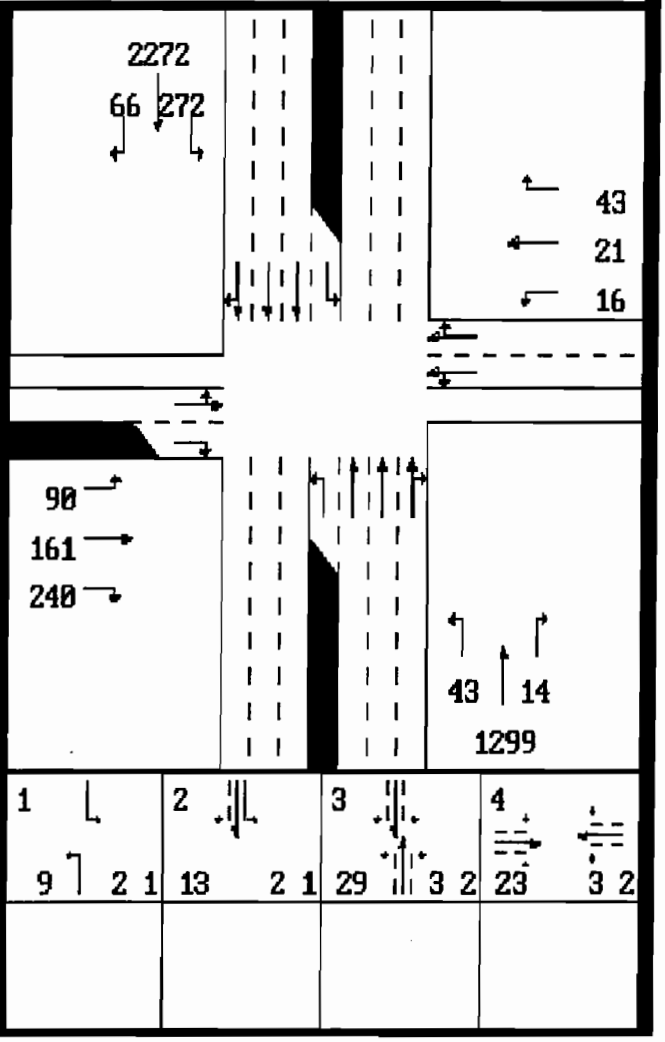
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: PROTEXAM — Proton Drive/Midway Road

Existing Conditions — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	6/ 8	10.3	0.0
	R	5/ 7	1.8	13.9
	All		7.8	13.9
WB	LTR	1/ 2	10.4	0.0
	All		10.4	0.0
NB	L	1/ 2	5.1	0.0
	TR	8/ 9	11.9	0.0
	All		11.8	0.0
SB	L	9/ 11	2.4	22.2
	TR	8/ 12	15.7	0.0
	All		14.7	22.2
Intersect.			12.8	



NETSIM Results for Case: PROTEXAM — Proton Drive/Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	6	8	0.0			9:34
	R	5	7	13.9	30.0	60.0	12:25
WB	LTR	1	2	0.0			0:30
NB	L	1	2	0.0	0.0	0.0	9:45
	TR	8	9	0.0			8:23
SB	L	9	11	22.2	70.0	30.0	3:56
	TR	8	12	0.0			7:14

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: PROTEXAM — Proton Drive/Midway Road

Existing Conditions — AM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.5	0.0	0.0	10.3	7.4	0.0
WB	0.2	0.0	0.0	15.2	0.0	0.0
NB	6.4	0.5	0.0	10.7	4.2	0.0
SB	11.0	0.5	0.0	11.8	4.3	0.0
All	19.1	1.0	0.0	11.3	4.4	0.0

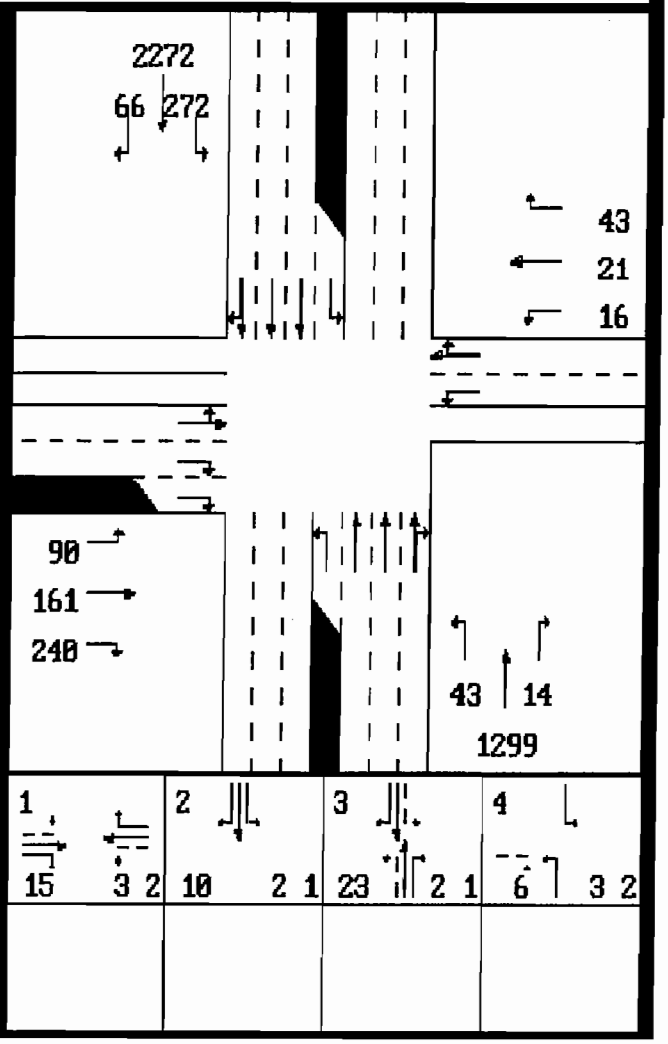
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	126.8	2105.8	301.1	0
WB	17.5	238.0	29.1	0
NB	364.4	11043.4	1107.8	0
SB	614.2	18249.3	2107.9	0
All	332.9	9593.4	1091.8	

HCM Summary Results for Case: PROTAMQ Proton Drive/Midway Road

Exist. Traffic w/CMAQ Improvements AM Peak Version 3.06

	Lane Grp	v/s	X v/c	Lane Grp Delay (sec/veh)	L O S	App Delay (sec/veh)	App L O S
EB	LT	*0.18	0.72	23.0	C	16.7	C
	R	0.10	0.26	10.7	B		
WB	L	0.05	0.19	16.1	C	16.1	C
	TR	0.05	0.21	16.1	C		
NB	Lper	0.15				19.6	C
	Lpro	*0.00	0.15#	18.5	C		
	TR	0.29	0.87	19.6	C		
SB	Lper	0.00				15.8	C
	Lpro	0.16	0.45#	12.8	B		
	TR	*0.49	0.96	16.1	C		
	Int.	0.67	0.77	17.1	C	#L	TOTAL



Input Data for Case: PROTAMQ — Proton Drive/Midway Road

Exist. Traffic w/CMAQ Improvements — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	4	4
Outbound Street	1	1	3	3

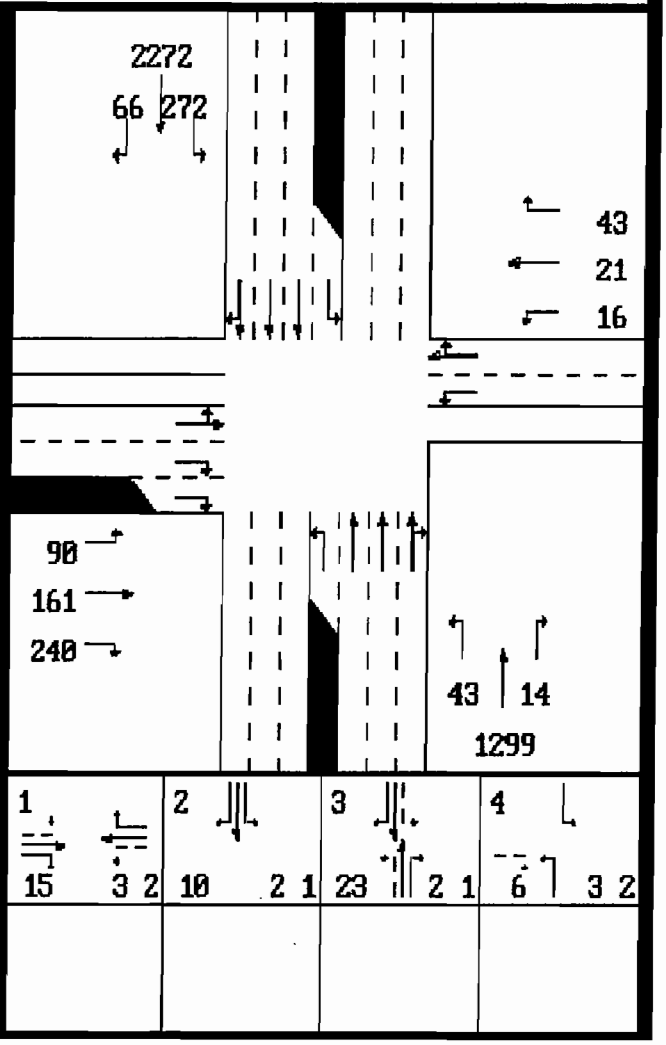
2)

	-Pkt Lanes- Left	Right	--Lane Lengths-- Full L	Pkt	R Pkt
EB	0	1	1000		100
WB	0	0	1000		
NB	1	0	1000	150	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

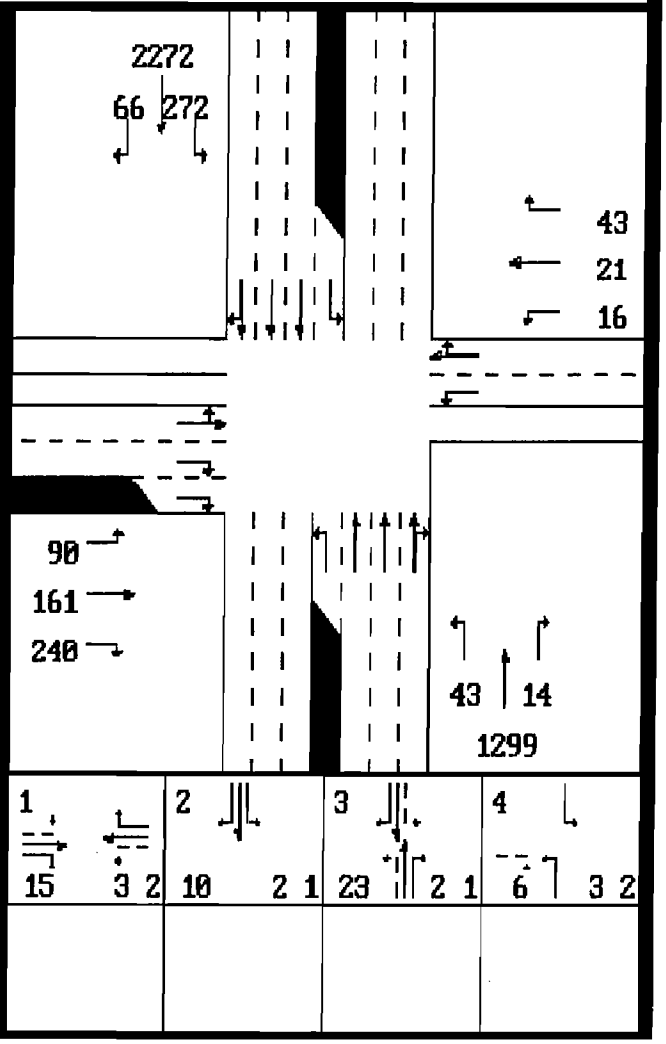
	Median	2	3	4	5	6
EB		12.0	12.0	12.0		
WB		12.0	12.0			
NB		12.0	12.0	12.0	12.0	
SB		12.0	12.0	12.0	12.0	



NETSIM Summary for Case: PROTAMQ — Proton Drive/Midway Road

Exist. Traffic w/CMAQ Improvements — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	7/ 8	10.2	0.0
	R	1/ 2	19.3	0.0
	All		12.8	0.0
WB	L	1/ 2	11.4	0.0
	TR	1/ 2	20.6	0.0
	All		17.5	0.0
NB	L	0/ 1	9.7	0.0
	TR	7/ 9	12.5	0.0
	All		12.5	0.0
SB	L	6/ 9	3.7	0.0
	TR	7/ 14	16.4	0.0
	All		15.1	0.0
Intersect.			14.0	



NETSIM Results for Case: PROTAMQ — Proton Drive/Midway Road

Exist. Traffic w/CMAQ Improvements — AM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	7	8	0.0			1:53
	R	1	2	0.0	0.0	0.0	14:13
WB	L	1	2	0.0			0:39
	TR	1	2	0.0			13:29
NB	L	0	1	0.0	0.0	0.0	4:10
	TR	7	9	0.0			6:36
SB	L	6	9	0.0	0.0	0.0	3:57
	TR	7	14	0.0			1:13

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: PROTAMQ Proton Drive/Midway Road

Exist. Traffic w/CMAQ Improvements AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.6	0.0	0.0	16.0	12.3	0.0
WB	0.2	0.0	0.0	21.2	0.0	0.0
NB	6.3	0.4	0.0	10.9	4.5	0.0
SB	10.5	0.4	0.0	12.4	5.7	0.0
All	18.7	0.8	0.0	12.3	5.4	0.0

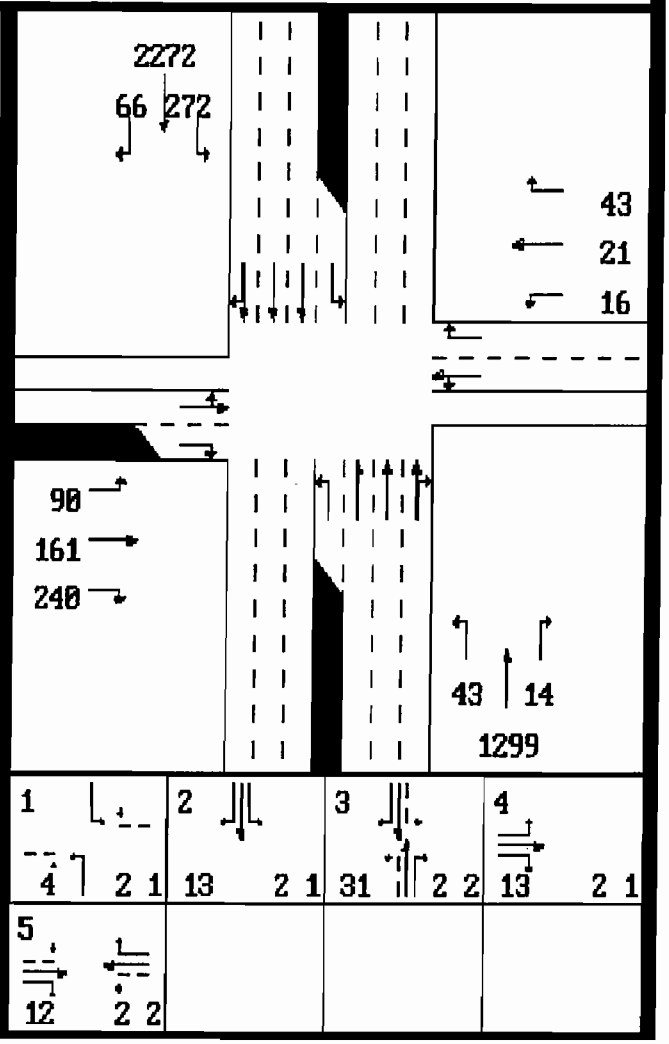
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	76.9	1106.7	158.7	13
WB	11.5	138.5	20.5	10
NB	358.3	10918.7	1173.9	0
SB	586.6	16806.7	1960.6	0
All	258.3	7242.7	828.4	

HCM Summary Results for Case: PROTAM1 Proton Drive/Midway Road

Existing Traffic w/ new phasing AM Peak Version 3.06

	Lane Grp	v/s	X v/c	Lane Grp Delay (sec/veh)	Lane Grp LOS	App Delay (sec/veh)	App LOS
EB	LT	*0.16	0.49	19.3	C	17.2	C
	R	0.17	0.42	15.0	C		
WB	LT	0.04	0.28	26.3	D	23.7	C
	R	0.04	0.16	21.5	C		
NB	Lper	0.00				21.1	C
	Lpro	*0.03	0.29#	13.8	B		
	TR	0.29	0.81	21.3	C		
SB	Lper	0.00				16.6	C
	Lpro	0.16	0.61#	14.2	B		
	TR	*0.49	0.92	16.8	C		
	Int.	0.68	0.75	18.2	C	#L	TOTAL



Input Data for Case: PROTAM1 — Proton Drive/Midway Road

Existing Traffic w/ new phasing — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	1	1	3	3

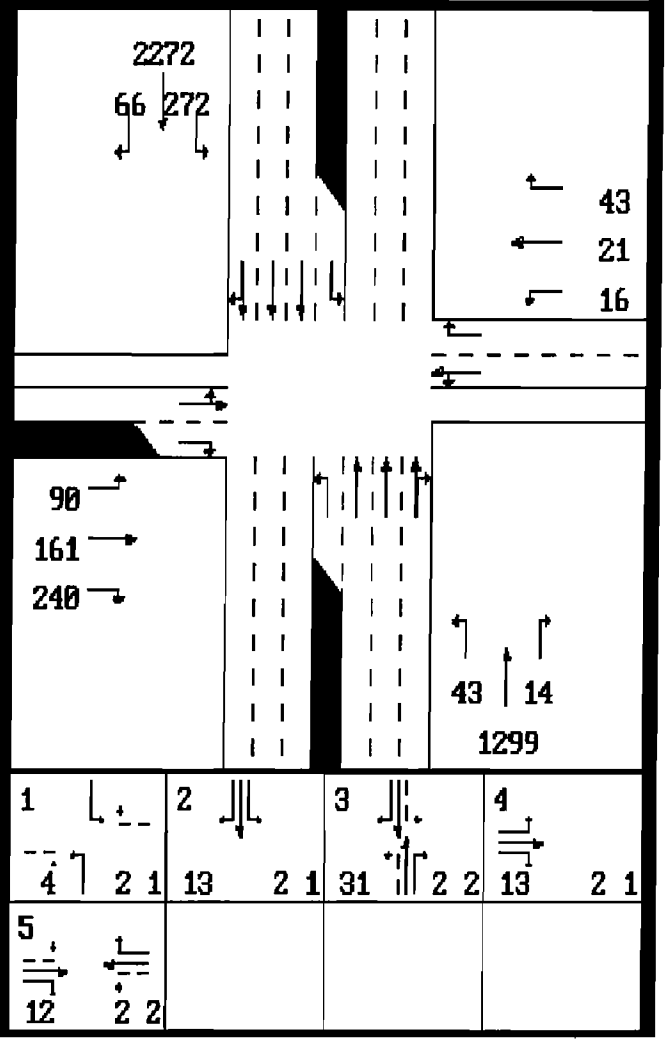
2)

	-Pkt Lanes- Left	Right	—Lane Lengths— Full L Pkt	R Pkt
EB	0	1	600	100
WB	0	0	600	
NB	1	0	1000	175
SB	1	0	1000	250

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

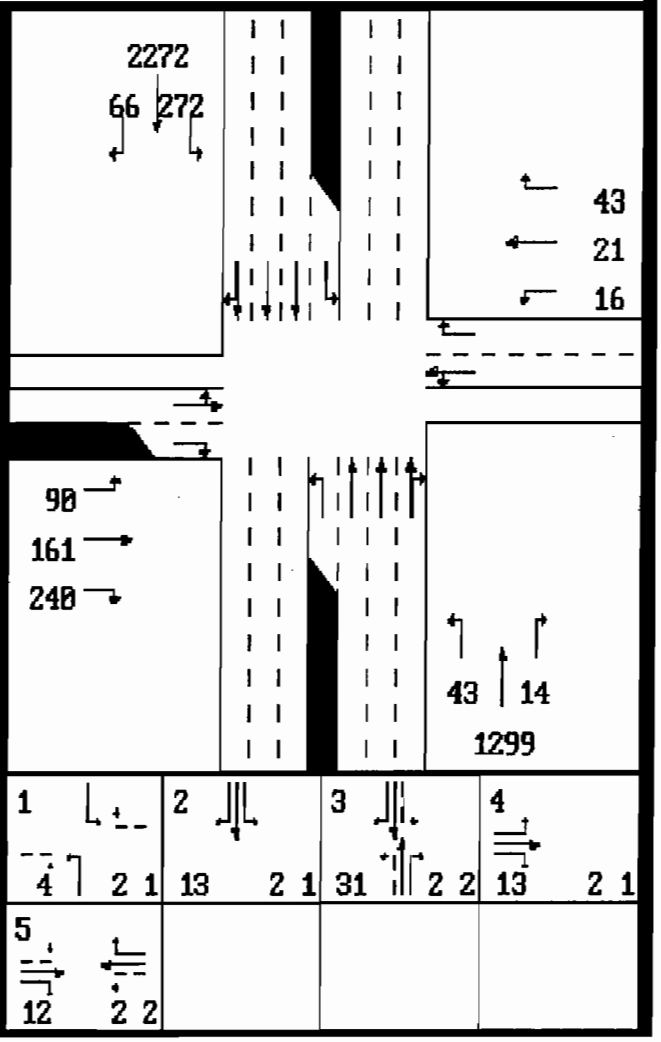
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: PROTAM1 — Proton Drive/Midway Road

Existing Traffic w/ new phasing — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	6/ 8	12.2	0.0
	R	3/ 6	3.6	1.2
	All		10.2	1.2
WB	LT	1/ 3	8.6	0.0
	R	1/ 2	9.8	0.0
	All		9.2	0.0
NB	L	1/ 2	6.9	0.0
	TR	7/ 9	12.6	0.0
	All		12.6	0.0
SB	L	8/ 11	4.0	0.0
	TR	6/ 10	18.6	0.0
	All		16.6	0.0
Intersect.			14.3	



NETSIM Results for Case: PROTAM1 Proton Drive/Midway Road

Existing Traffic w/ new phasing AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	6	8	0.0			14:03
	R	3	6	1.2	10.0	30.0	2:01
WB	LT	1	3	0.0			12:42
	R	1	2	0.0			0:30
NB	L	1	2	0.0	0.0	0.0	9:46
	TR	7	9	0.0			5:17
SB	L	8	11	0.0	0.0	0.0	3:52
	TR	6	10	0.0			7:15

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: PROTAM1 Proton Drive/Midway Road

Existing Traffic w/ new phasing AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	1.2	0.0	0.0	12.5	12.7	0.0
WB	0.2	0.0	0.0	14.1	0.0	0.0
NB	6.4	0.4	0.0	10.7	4.4	0.0
SB	9.8	0.4	0.0	13.1	5.9	0.0
All	17.7	0.9	0.0	12.2	5.4	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

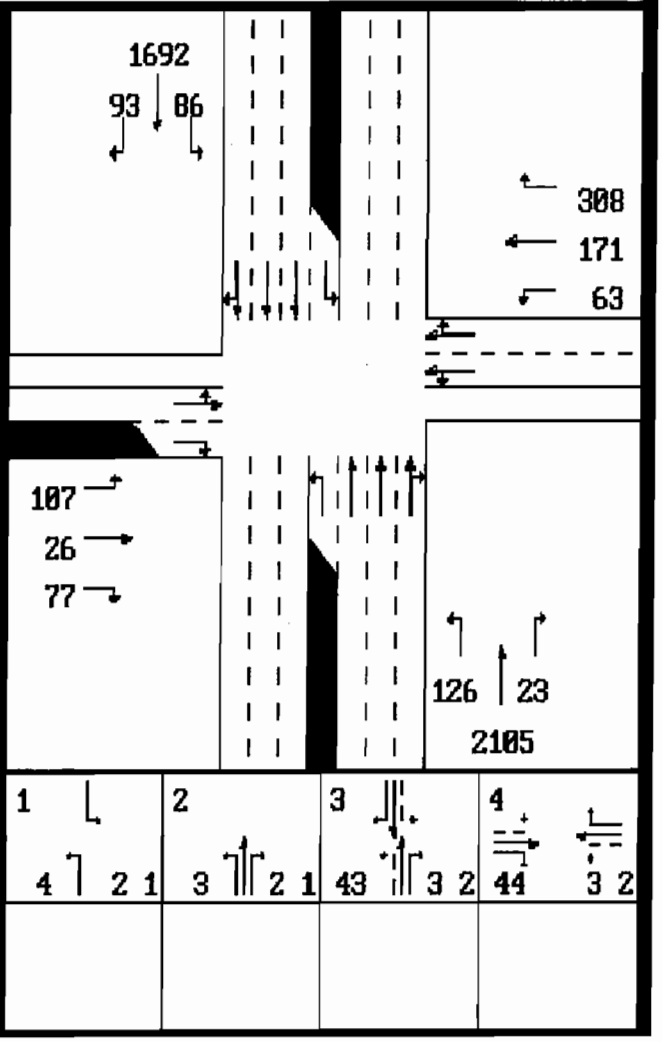
	HC	CO	NOX	RTOR Maneuvers Completed
EB	105.0	1804.5	257.5	0
WB	18.5	283.9	27.1	0
NB	363.0	11191.9	1222.0	0
SB	551.4	16480.3	1858.8	0
All	308.9	9024.1	1016.1	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: PROTEXPM Proton Drive/Midway Road

Existing Conditions PM Peak Version 3.06

			- Lane Grp -		- App -	
			Delay	L	Delay	L
Lane		X	(sec/	O	(sec/	O
Grp	v/s	v/c	veh)	S	veh)	S
EB LT	*0.44	1.04	93.2	F	66.9	F
R	0.05	0.13	15.0	B		
WB LTR	0.22	0.52	18.5	C	18.5	C
NB Lper	0.00				28.6	D
Lpro	0.08	0.60#	18.9	C		
TR	*0.46	0.98	29.1	D		
SB Lper	0.21				35.4	D
Lpro	*0.04	0.75#	30.6	D		
TR	0.41	0.99	35.6	D		
Int.	0.93	1.01	31.8	D	#L	TOTAL



Input Data for Case: PROTEXPM — Proton Drive/Midway Road

Existing Conditions — PM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	1	1	3	3

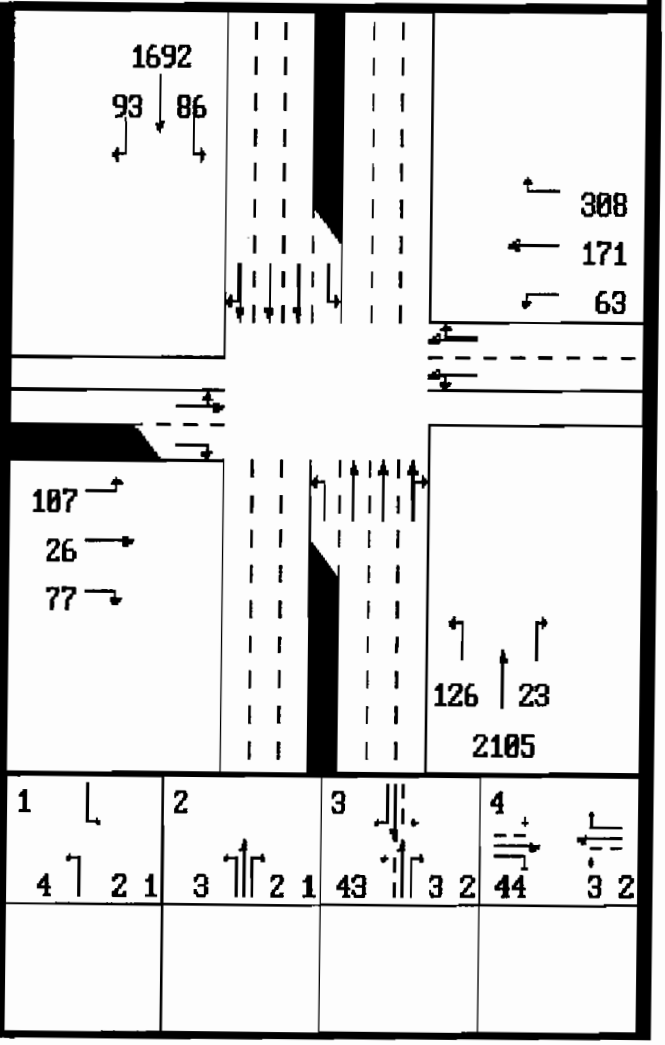
2)

	-Pkt Lanes- Left	Right	—Lane Lengths— Full L	Pkt L	R Pkt
EB	0	1	600		80
WB	0	0	600		
NB	1	0	1000	85	
SB	1	0	1000	100	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		

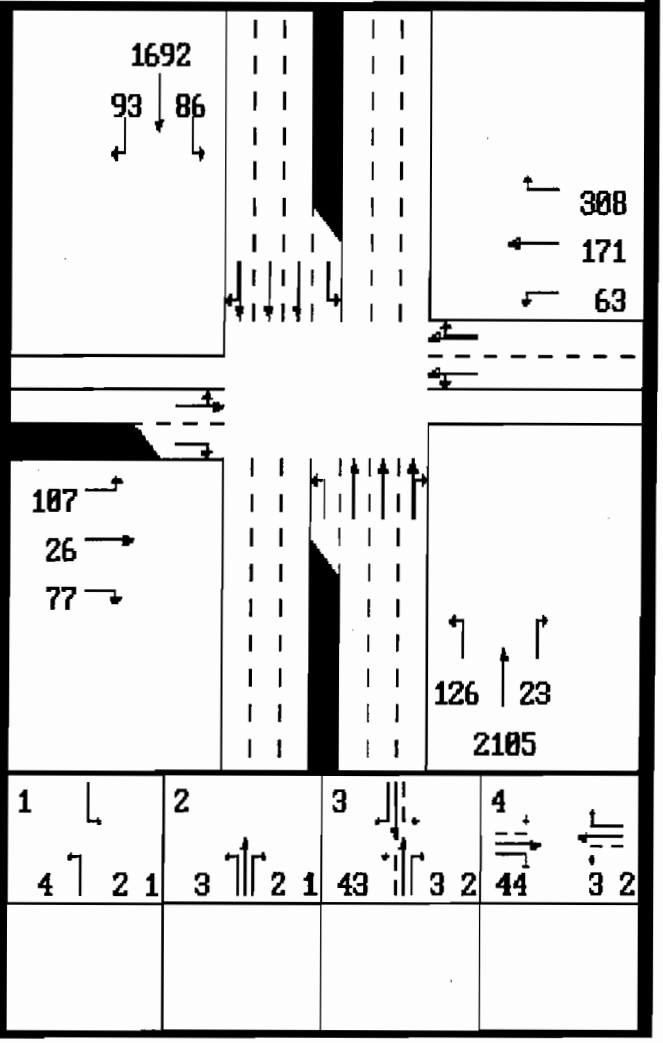


NETSIM Results for Case: PROTEXPM Proton Drive/Midway Road

Existing Conditions PM Peak Version 3.06

Simulation results indicate that the peak period traffic movements identified by X are oversaturated and cannot be serviced

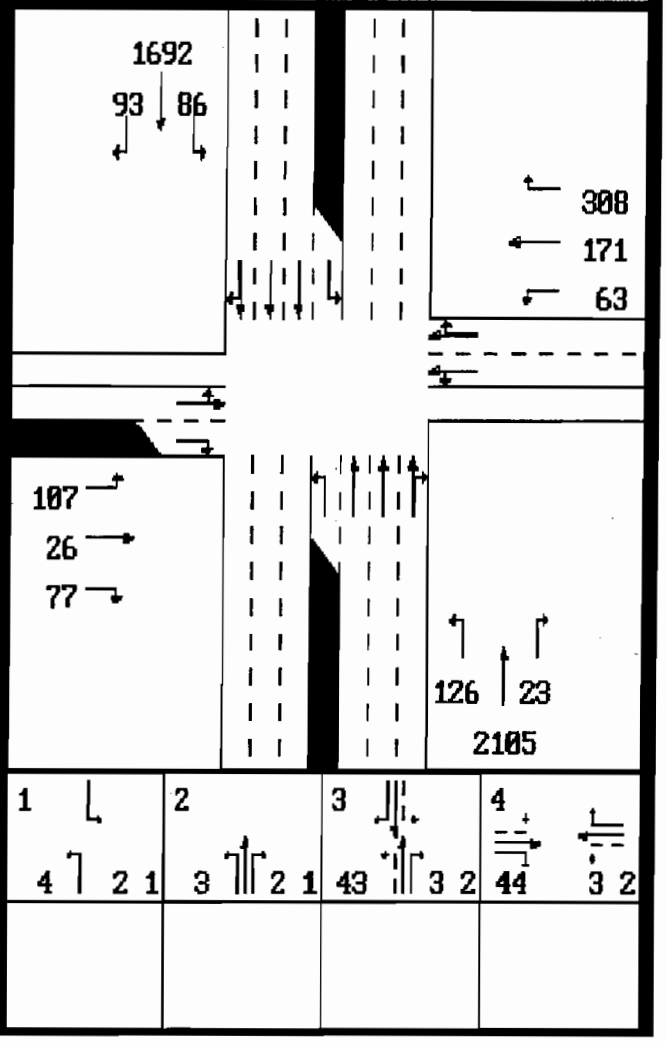
Approach	Left	Thru	Right
SB	X		



NETSIM Summary for Case: PROTEXPM — Proton Drive/Midway Road

Existing Conditions — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	4/ 5	10.8	0.0
	R	1/ 3	7.7	0.0
	All		10.5	0.0
WB	LTR	5/ 10	11.5	0.0
	All		11.5	0.0
NB	L	9/ 12	0.8	48.7
	TR	16/ 29	8.0	0.0
	All		7.6	48.7
SB	L	14/ 20	0.5	72.9
	TR	20/ 43	5.3	0.0
	All		5.0	72.9
Intersect.			6.5	



NETSIM Results for Case: PROTEXPM — Proton Drive/Midway Road

Existing Conditions — PM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	4	5	0.0			5:14
	R	1	3	0.0	0.0	0.0	10:36
WB	LTR	5	10	0.0			1:31
NB	L	9	12	48.7	75.0	25.0	3:38
	TR	16	29	0.0			9:47
SB	L	14	20	72.9	100.0	37.5	11:02
	TR	20	43	0.0			14:56

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: PROTEXPM — Proton Drive/Midway Road

Existing Conditions — PM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.5	0.0	0.0	14.2	8.3	0.0
WB	1.3	0.0	0.0	14.0	9.5	0.0
NB	14.7	0.4	0.0	7.6	3.4	0.0
SB	15.0	0.5	0.0	6.0	3.0	0.0
All	31.5	1.0	0.0	7.2	3.6	0.0

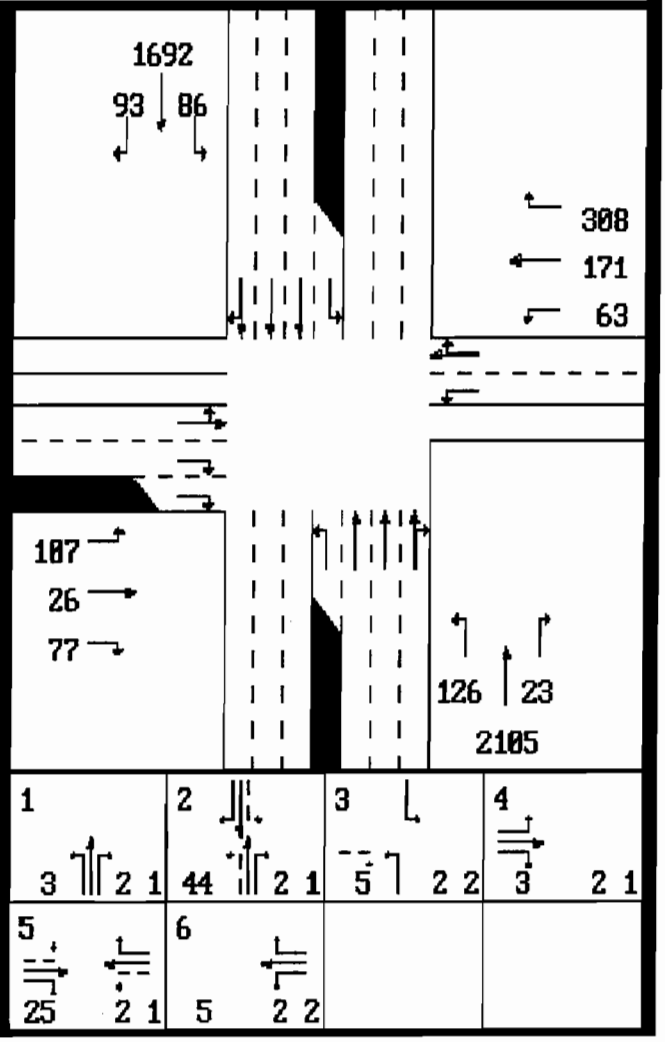
Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	43.9	625.0	89.7	9
WB	107.0	1832.9	238.3	11
NB	787.8	20743.9	2560.1	0
SB	781.2	18290.3	2243.0	4
All	518.6	12659.1	1562.4	

HCM Summary Results for Case: PROTPMQ Proton Drive/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

			- Lane Grp - Delay	L O S	- App - Delay	L O S
Lane Grp	v/s	X v/c	(sec/ veh)		(sec/ veh)	
EB LT	0.13	0.44	23.4	C	21.6	C
R	0.02	0.07	17.2	C		
WB Lper	0.07				52.6	E
Lpro	0.00	0.17#	19.5	C		
TR	*0.32	1.00	56.9	E		
NB Lper	0.00				24.7	C
Lpro	*0.08	0.50#	31.6	D		
TR	0.46	0.96	24.3	C		
SB Lper	*0.42				30.4	D
Lpro	0.02	0.58#	35.9	D		
TR	0.41	0.97	30.1	D		
Int.	0.82	0.90	29.8	D	#L	TOTAL



Input Data for Case: PROTPMQ Proton Drive/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	3	2	4	4
Outbound Street	1	1	3	3

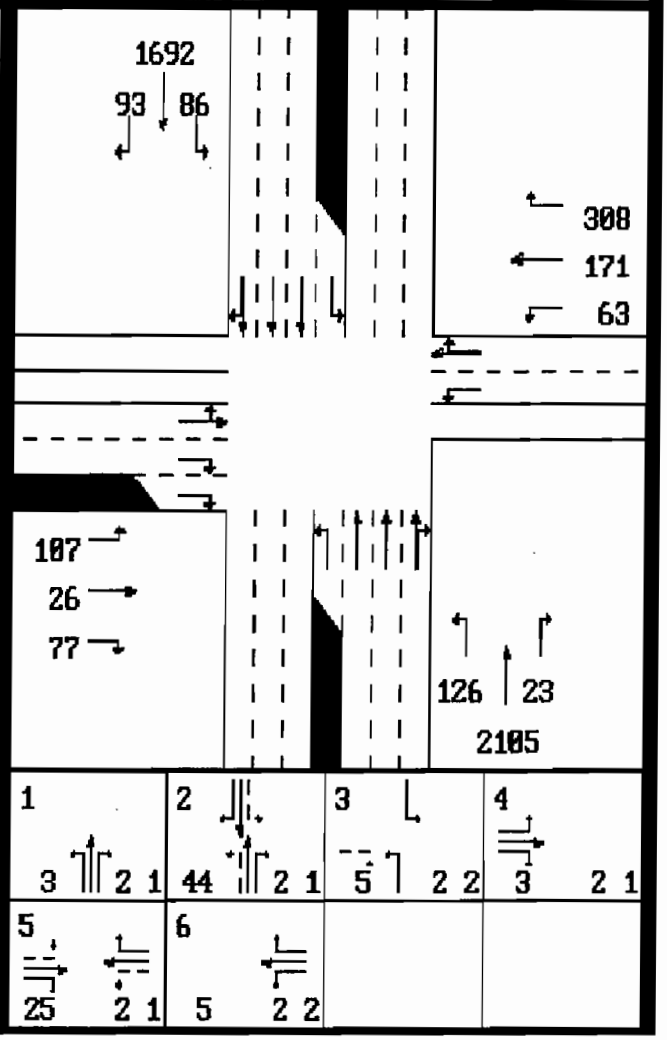
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt	R Pkt
EB	0	1	600		100
WB	0	0	600		
NB	1	0	1000	150	
SB	1	0	1000	200	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

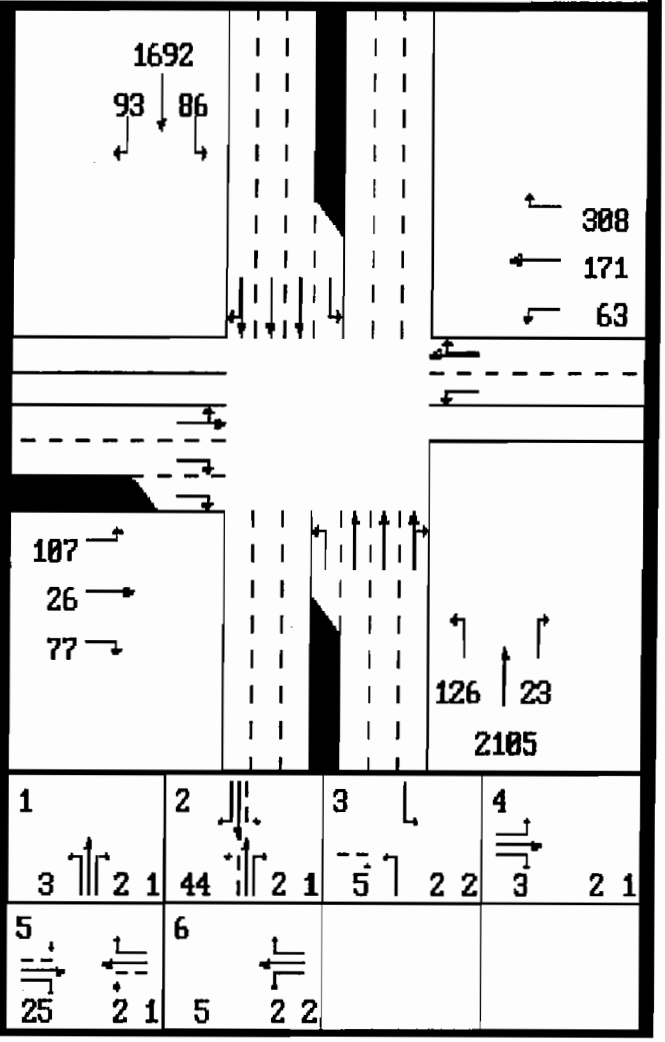
	Median	2	3	4	5	6
EB	12.0	12.0	12.0			
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: PROTPMQ Proton Drive/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	4/ 6	6.8	0.0
	R	1/ 1	17.4	0.0
	All		8.9	0.0
WB	L	1/ 3	10.5	0.0
	TR	21/ 28	3.3	2.8
	All		3.5	2.8
NB	L	4/ 9	1.8	0.9
	TR	7/ 12	17.3	0.0
	All		15.9	0.9
SB	L	6/ 10	1.4	0.0
	TR	12/ 15	12.2	0.0
	All		10.9	0.0
Intersect.			10.9	



NETSIM Results for Case: PROTPMQ — Proton Drive/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	4	6	0.0			6:19
	R	1	1	0.0	0.0	0.0	4:12
WB	L	1	3	0.0			9:23
	TR	21	28	2.8			13:39
NB	L	4	9	0.9	11.1	0.0	1:03
	TR	7	12	0.0			14:33
SB	L	6	10	0.0	0.0	33.3	11:26
	TR	12	15	0.0			12:17

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: PROTPMQ — Proton Drive/Midway Road

Exist. Traffic w/ CMAQ Improvements PM Peak — Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.6	0.0	0.0	12.6	9.6	0.0
WB	3.2	0.1	0.0	5.3	3.1	0.0
NB	9.5	0.3	0.0	12.5	5.6	0.0
SB	9.9	0.4	0.0	10.1	4.1	0.0
All	23.3	0.9	0.0	10.5	4.5	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

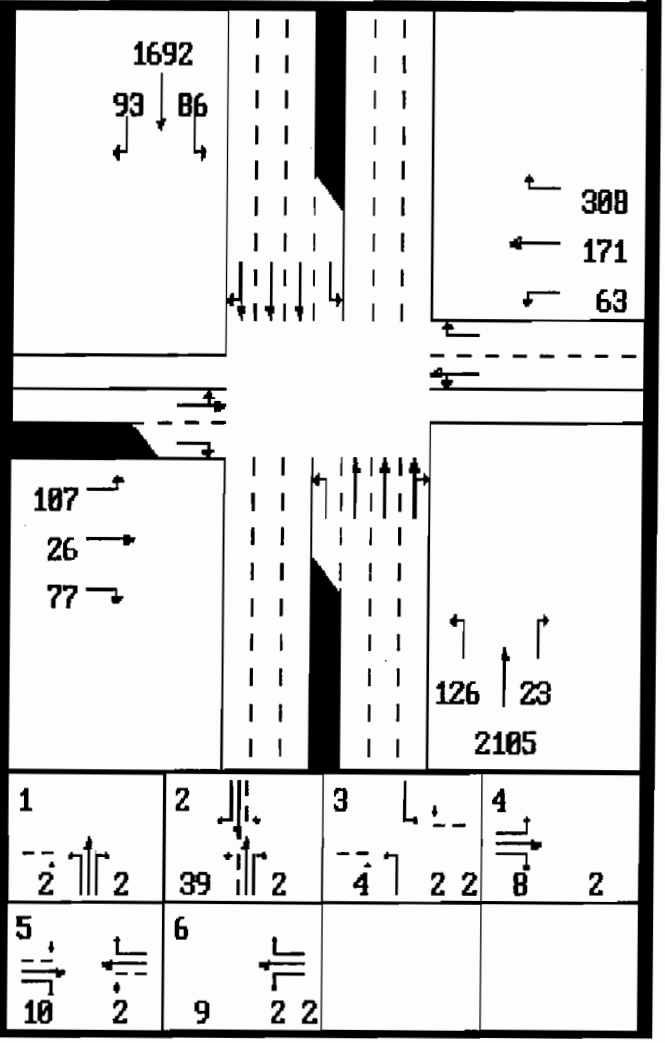
	HC	CO	NOX	RTOR Maneuvers Completed
EB	49.7	684.2	98.6	5
WB	256.5	4056.6	555.1	25
NB	529.4	15817.9	1818.9	0
SB	563.5	16800.1	1819.7	8
All	399.0	11082.0	1259.6	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

HCM Summary Results for Case: PROTPM1 Proton Drive/Midway Road

Existing Traffic w/ new phasing PM Peak Version 3.06

				- Lane Grp - Delay	L O S	- App - Delay	L O S
	Lane Grp	v/s	X v/c	(sec/ veh)		(sec/ veh)	
EB	LT	0.13	0.60	26.3	D	23.6	C
	R	0.04	0.12	16.2	C		
WB	LT	*0.15	0.61	24.0	C	23.8	C
	R	0.22	0.70	23.6	C		
NB	Lper	0.00				21.1	C
	Lpro	*0.08	0.52#	26.5	D		
	TR	0.46	0.96	20.8	C		
SB	Lper	*0.43				23.2	C
	Lpro	0.01	0.53#	28.4	D		
	TR	0.41	0.94	22.9	C		
	Int.	0.66	0.74	22.3	C	#L TOTAL	



Input Data for Case: PROTPM1 — Proton Drive/Midway Road

Existing Traffic w/ new phasing — PM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	1	1	3	3

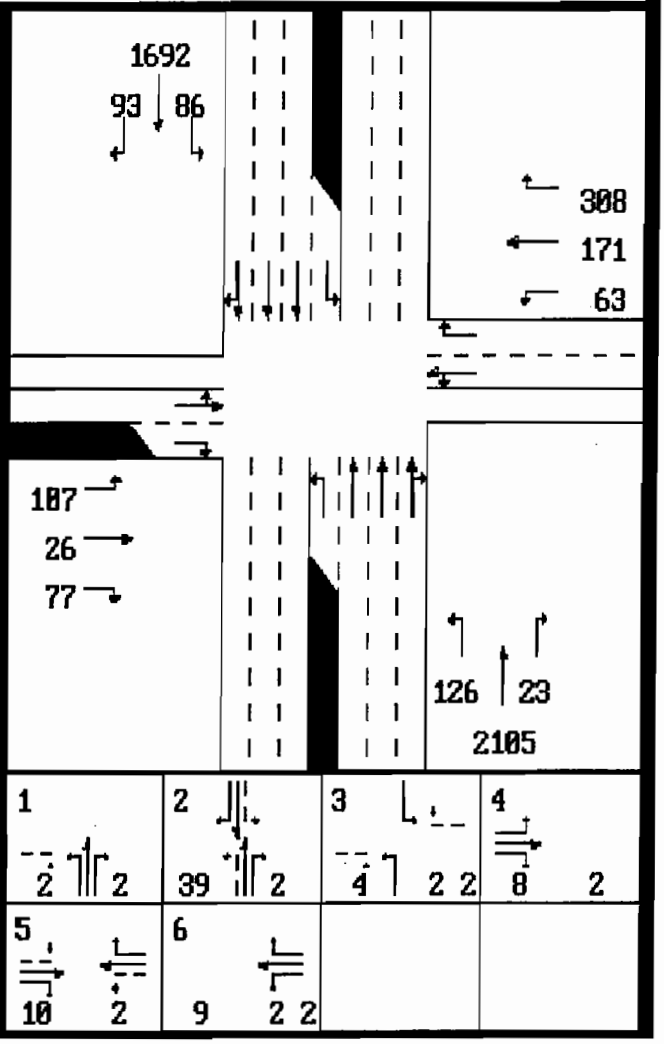
2)

	-Pkt Lanes-		—Lane Lengths—		
	Left	Right	Full L Pkt		R Pkt
EB	0	1	600		100
WB	0	0	600		
NB	1	0	1000	175	
SB	1	0	1000	250	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

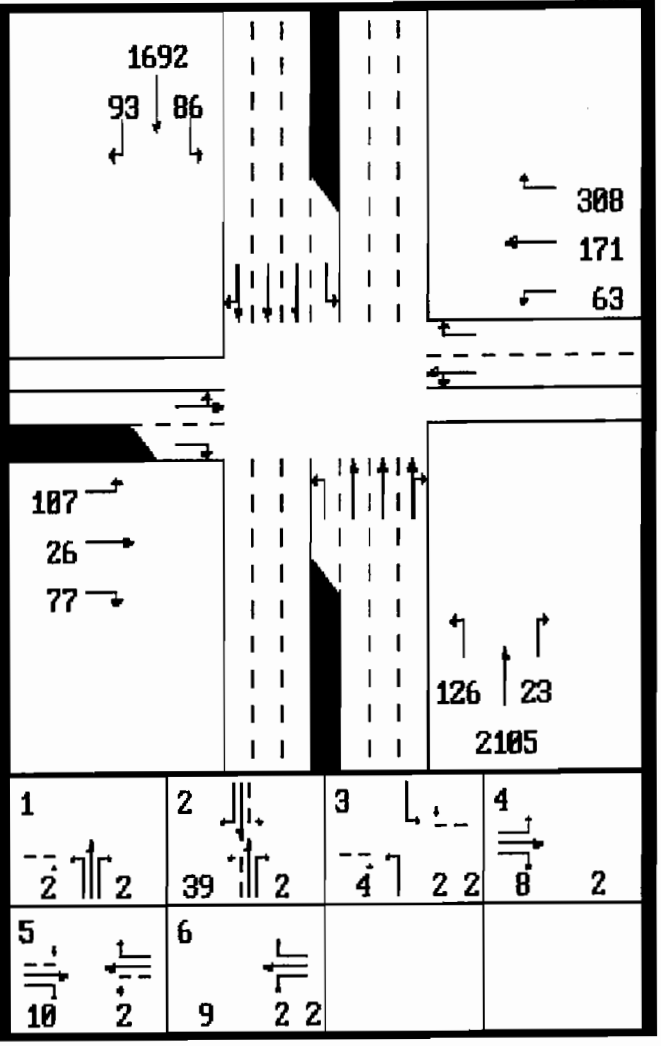
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: PROTPM1 — Proton Drive/Midway Road

Existing Traffic w/ new phasing — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	4/ 5	9.2	0.0
	R	1/ 2	7.2	0.0
	All		9.0	0.0
WB	LT	4/ 8	9.3	0.0
	R	5/ 8	12.3	0.0
	All		10.9	0.0
NB	L	4/ 7	1.9	0.0
	TR	6/ 8	18.4	0.0
	All		16.7	0.0
SB	L	6/ 10	1.9	0.0
	TR	10/ 13	13.5	0.0
	All		12.0	0.0
Intersect.			13.6	



NETSIM Results for Case: PROTPM1 — Proton Drive/Midway Road

Existing Traffic w/ new phasing — PM Peak — Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	4	5	0.0			0:01
	R	1	2	0.0	0.0	0.0	4:09
WB	LT	4	8	0.0			9:11
	R	5	8	0.0			13:18
NB	L	4	7	0.0	0.0	0.0	1:25
	TR	6	8	0.0			6:45
SB	L	6	10	0.0	0.0	0.0	8:49
	TR	10	13	0.0			3:30

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: PROTPM1 Proton Drive/Midway Road

Existing Traffic w/ new phasing PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.6	0.0	0.0	12.4	23.5	0.0
WB	1.3	0.0	0.0	14.0	11.5	0.0
NB	8.6	0.3	0.0	13.4	5.3	0.0
SB	9.2	0.3	0.0	11.0	5.1	0.0
All	19.7	0.7	0.0	12.3	5.7	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	50.5	739.7	102.5	10
WB	105.7	1660.8	218.1	35
NB	473.2	13533.5	1566.0	0
SB	519.3	15699.6	1638.4	8
All	339.4	9585.4	1061.5	

Average speed on previous page may be overstated since it was necessary to combine yellow and all-red intervals

****

File Name DOOLEXAM.HC0
Streets: (N-S) Midway Road (E-W) Boyington/Dooley
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... SKT
Date of Analysis..... 12/16/96
Other Information..... AM Peak - Existing Conditions

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3<	0	1	3<	0	0>	1<	0	0>	1<	0
Stop/Yield			N			N						
Volumes	92	749	35	5	2042	39	0	0	18	6	0	4
PHF	.97	.97	.97	.98	.98	.98	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1	1	1	1	1	1	1	1	1	1	1	1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

****

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	267	700
Potential Capacity: (pcph)	1014	612
Movement Capacity: (pcph)	1014	612
Prob. of Queue-free State:	1.00	0.97
Step 2: LT from Major Street	**SB**	**NB**
Conflicting Flows: (vph)	784	2081
Potential Capacity: (pcph)	650	131
Movement Capacity: (pcph)	650	131
Prob. of Queue-free State:	0.99	0.27
Step 3: TH from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	2944	2942
Potential Capacity: (pcph)	21	21
Capacity Adjustment Factor due to Impeding Movements	0.27	0.27
Movement Capacity: (pcph)	6	6
Prob. of Queue-free State:	1.00	1.00
Step 4: LT from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	2905	2908
Potential Capacity: (pcph)	15	15
Major LT, Minor TH Impedance Factor:	0.27	0.27
Adjusted Impedance Factor:	0.41	0.41
Capacity Adjustment Factor due to Impeding Movements	0.39	0.41
Movement Capacity: (pcph)	6	6

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)		SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
EB	R	19	612	>	612	> 6.1	> B	
WB	L	6	6	>		>	>	
					10	*	F	*
WB	R	4	1014	>		>	>	
NB	L	95	131			91.7	F	9.6
SB	L	5	650			5.6	B	0.0

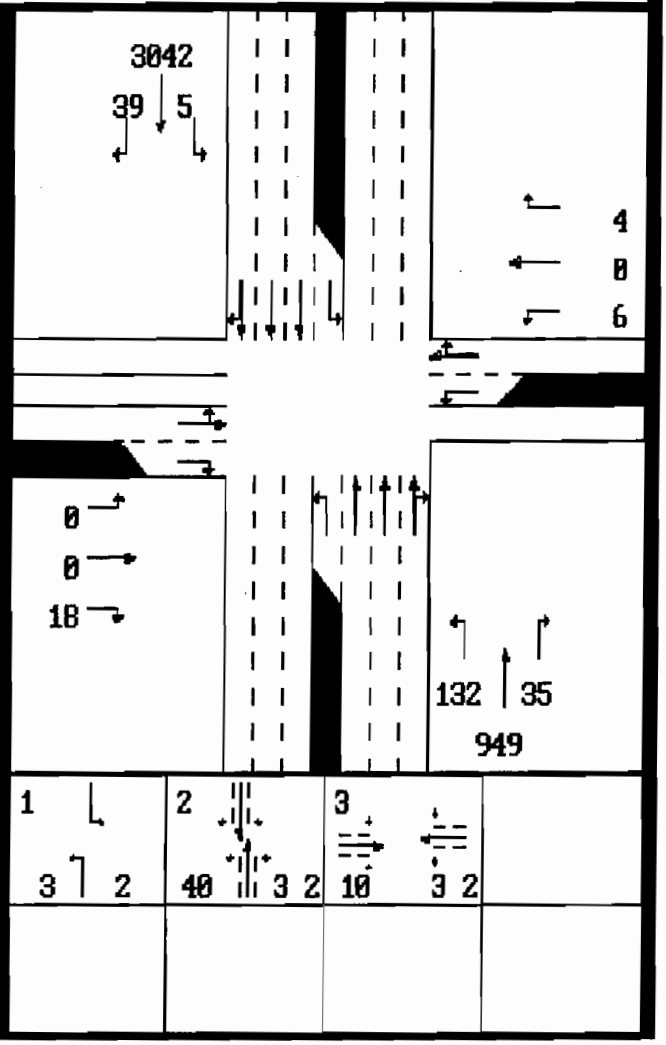
Intersection Delay = 6.8

* The calculated delay was greater than 999.9 sec.

HCM Summary Results for Case: DOOLCMAM Boyington Dr/Midway Road

Existing Conditions Existing Traffi AM Peak Version 3.06

				- Lane Grp -		- App -	
				Delay	L	Delay	L
	Lane		X	(sec/	O	(sec/	O
	Grp	v/s	v/c	veh)	S	veh)	S
EB	LT	0.00	0.00	0.0	A	16.6	C
	R	*0.01	0.06	16.6	C		
WB	L	0.00	0.02	16.5	C	16.5	C
	TR	0.00	0.01	16.5	C		
NB	Lper	0.38				2.3	A
	Lpro	*0.03	0.67#	6.2	B		
	TR	0.21	0.32	1.8	A		
SB	Lper	0.00				4.1	A
	Lpro	0.00	0.02#	1.9	A		
	TR	*0.63	0.97	4.1	A		
	Int.	0.67	0.78	3.7	A	#L	TOTAL



Input Data for Case: DOOLCMAM — Dooley Drive/Midway Road

Existing Traffic w/ CMAQ Improvemen — AM Peak — Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	1	1	3	3

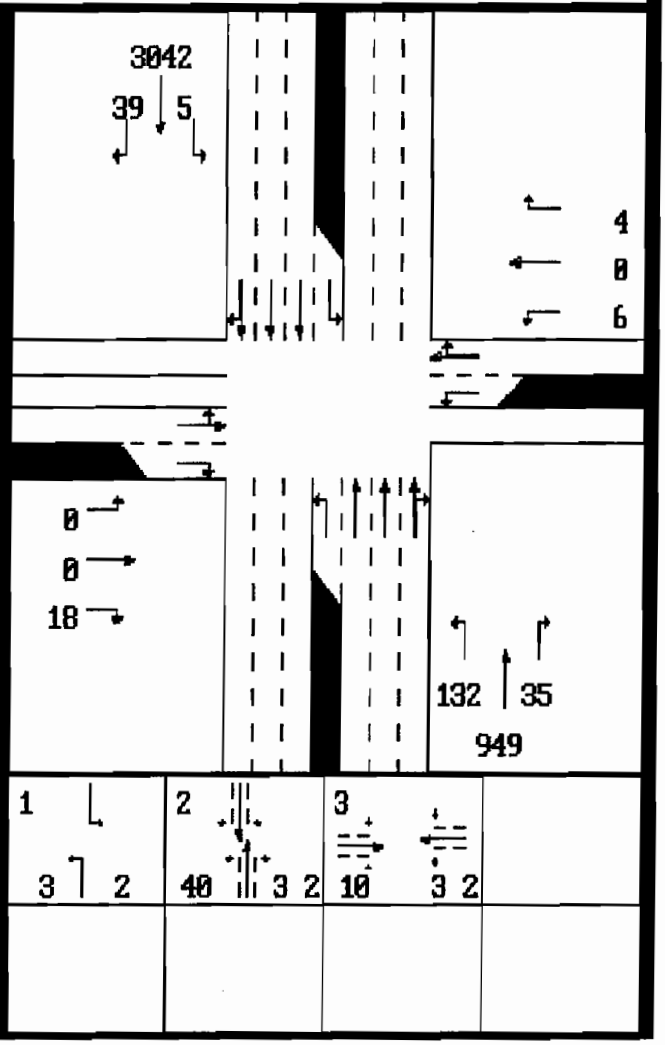
2)

	-Pkt Lanes-		--Lane Lengths--		
	Left	Right	Full L	Pkt	R Pkt
EB	0	1	800		200
WB	1	0	600	100	
NB	1	0	1000	150	
SB	1	0	1000	100	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

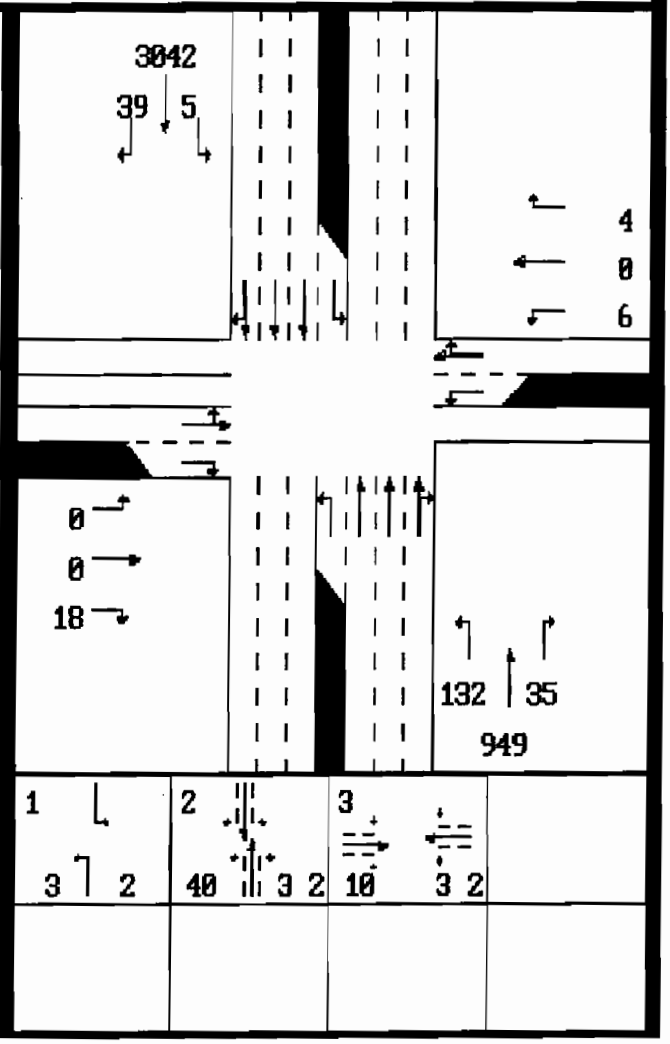
	Median	2	3	4	5	6
EB	12.0	12.0				
WB	12.0	12.0				
NB	12.0	12.0	12.0	12.0		
SB	12.0	12.0	12.0	12.0		



NETSIM Summary for Case: DOOLCMAM — Dooley Drive/Midway Road

Existing Traffic w/ CMAQ Improvemen — AM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	0/ 0	30.3	0.0
	R	0/ 1	3.5	0.0
	All		9.7	0.0
WB	L	0/ 1	3.3	0.0
	TR	0/ 1	23.0	0.0
	All		12.7	0.0
NB	L	4/ 5	2.1	0.0
	TR	1/ 3	23.4	0.0
	All		19.3	0.0
SB	L	0/ 0	0.0	0.0
	TR	9/ 13	18.1	0.0
	All		18.1	0.0
Intersect.			18.4	



NETSIM Results for Case: DOOLCMAM Dooley Drive/Midway Road
Existing Traffic w/ CMAQ Improvemen AM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	0	0	0.0			0:00
	R	0	1	0.0	0.0	0.0	2:51
WB	L	0	1	0.0	0.0	0.0	8:36
	TR	0	1	0.0			2:32
NB	L	4	5	0.0	0.0	0.0	14:10
	TR	1	3	0.0			13:11
SB	L	0	0	0.0	0.0	0.0	0:00
	TR	9	13	0.0			10:22

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: DOOLCMAM Dooley Drive/Midway Road

Existing Traffic w/ CMAQ Improvemen AM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.0	0.0	0.0	13.4	0.0	0.0
WB	0.0	0.0	0.0	14.0	0.0	0.0
NB	4.4	0.4	0.0	11.7	5.6	0.0
SB	10.3	0.1	0.0	15.0	7.2	0.0
All	14.8	0.5	0.0	14.0	6.0	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	2.9	57.7	6.3	2
WB	1.9	32.5	5.9	1
NB	258.0	9381.1	975.9	1
SB	563.7	14908.4	1742.7	0
All	242.7	7163.3	882.1	

****

File Name DOOLEXPM.HC0
Streets: (N-S) Midway Road (E-W) Boyington/Dooley
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... SKT
Date of Analysis..... 12/16/96
Other Information..... PM Peak - Existing Conditions

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3<	0	1	3<	0	0>	1<	0	0>	1<	0
Stop/Yield			N			N						
Volumes	63	2626	7	7	1278	10	17	0	108	32	0	20
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1	1	1	1	1	1	1	1	1	1	1	1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	879	431
Potential Capacity: (pcph)	497	837
Movement Capacity: (pcph)	497	837
Prob. of Queue-free State:	0.96	0.86
Step 2: LT from Major Street	**SB**	**NB**
Conflicting Flows: (vph)	2633	1288
Potential Capacity: (pcph)	66	349
Movement Capacity: (pcph)	66	349
Prob. of Queue-free State:	0.89	0.81
Step 3: TH from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	3988	3986
Potential Capacity: (pcph)	5	5
Capacity Adjustment Factor due to Impeding Movements	0.72	0.72
Movement Capacity: (pcph)	4	4
Prob. of Queue-free State:	1.00	1.00
Step 4: LT from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	3977	3978
Potential Capacity: (pcph)	3	3
Major LT, Minor TH Impedance Factor:	0.72	0.72
Adjusted Impedance Factor:	0.79	0.79
Capacity Adjustment Factor due to Impeding Movements	0.68	0.75
Movement Capacity: (pcph)	2	2

****

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)		SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
EB	L	18	2	>	14	> *	> F	*
EB	R	114	837	>		>	>	
WB	L	34	2	>	3	> *	> F	*
WB	R	21	497	>		>	>	
NB	L	66	349			12.7	C	0.3
SB	L	7	66			61.0	F	0.3

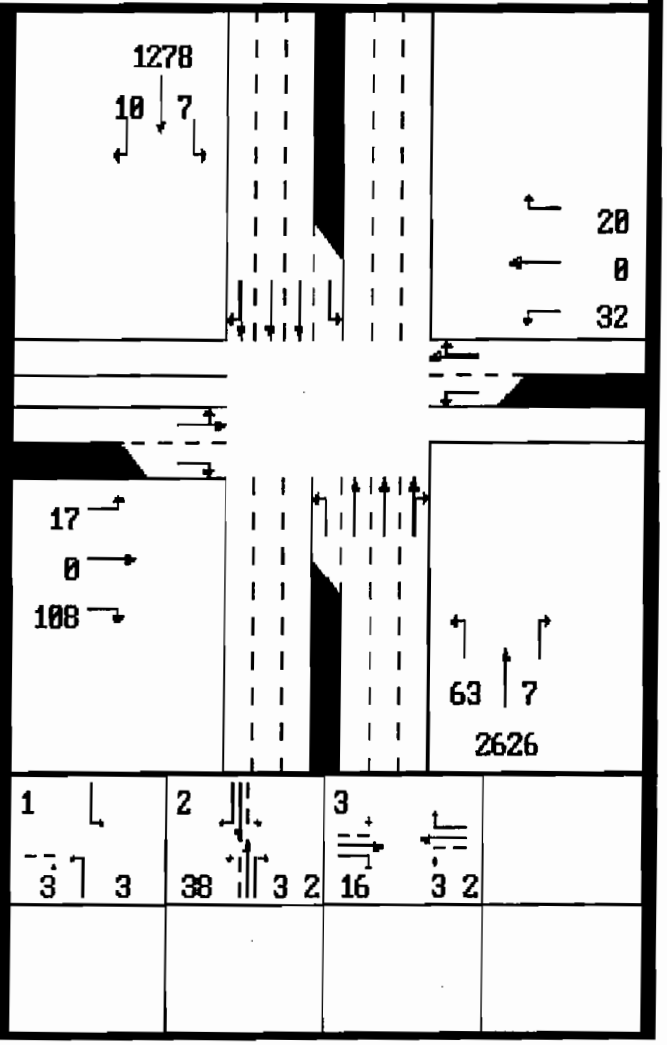
Intersection Delay = 890.9

* The calculated delay was greater than 999.9 sec.

HCM Summary Results for Case: DOOLCMPM Boyington Dr/Midway Road

CMAQ Improvements w/Exist. Traffic PM Peak Version 3.06

				- Lane Grp - Delay	L	- App - Delay	L
	Lane Grp	v/s	X v/c	(sec/ veh)	O S	(sec/ veh)	O S
EB	LT	0.01	0.06	14.9	B	12.9	B
	R	*0.08	0.24	12.5	B		
WB	L	0.03	0.10	15.1	C	15.0	C
	TR	0.02	0.06	14.9	B		
NB	Lper	0.00				13.9	B
	Lpro	0.04	0.35#	4.1	A		
	TR	*0.55	0.96	14.1	B		
SB	Lper	0.00				7.1	B
	Lpro	0.00	0.04#	11.3	B		
	TR	0.30	0.53	7.1	B		
	Int.	0.63	0.69	11.6	B	#L TOTAL	



Input Data for Case: DDOLCMPM Boyington Dr/Midway Road

CMAQ Improvements w/Exist. Traffic PM Peak Version 3.06

Intersection Geometry

1)Number of Lanes Including Pockets

	EB	WB	NB	SB
Approach Street	2	2	4	4
Outbound Street	1	1	3	3

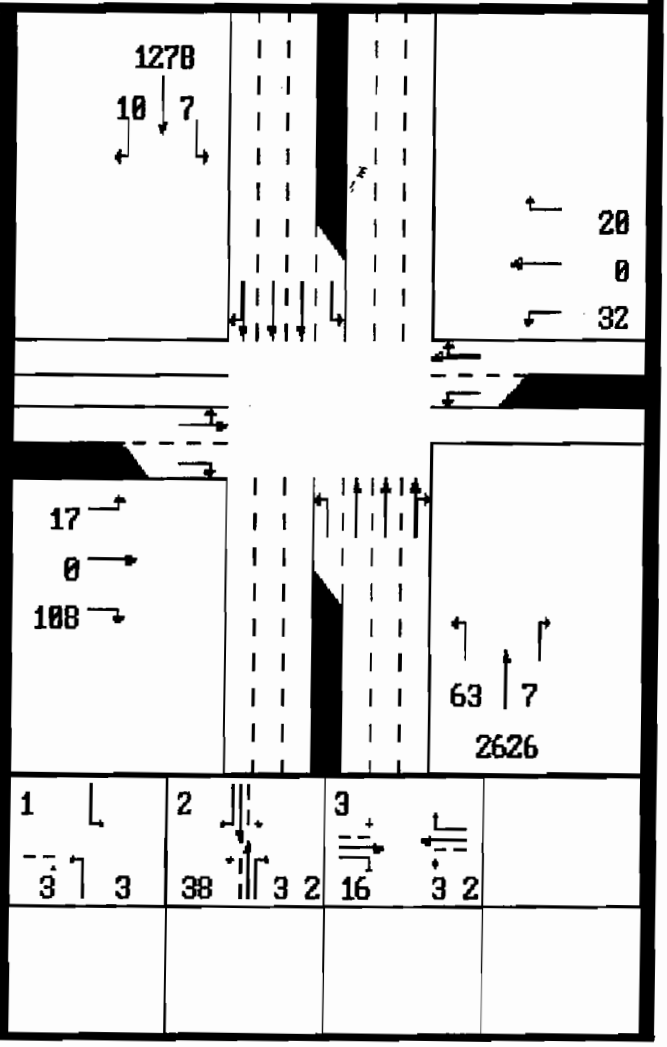
2)

	-Pkt Lanes-		—Lane Lengths—		
	Left	Right	Full L	Pkt R	Pkt
EB	0	1	800		200
WB	1	0	600	100	
NB	1	0	1000	150	
SB	1	0	1000	100	

3)Need to Revise Channelization? N

4) Lane Widths (Feet)

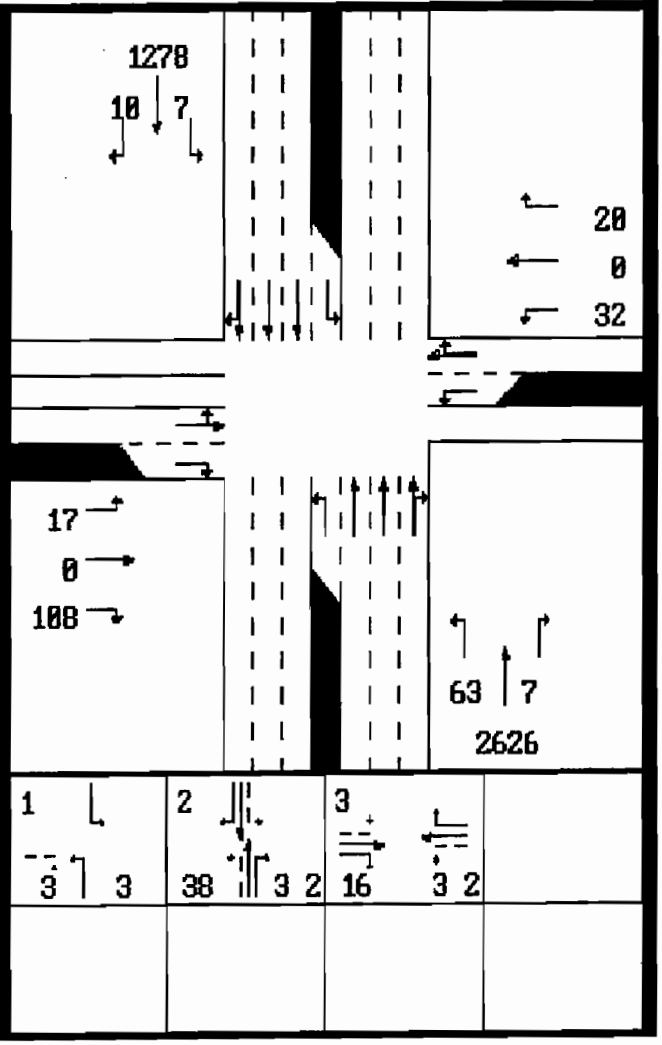
	Median	2	3	4	5	6
EB		12.0	12.0			
WB		12.0	12.0			
NB		12.0	12.0	12.0	12.0	
SB		12.0	12.0	12.0	12.0	



NETSIM Summary for Case: DOOLCMPM — Boyington Dr/Midway Road

CMAQ Improvements w/Exist. Traffic — PM Peak — Version 3.06

App	Lane Group	Queues Per Lane Avg/Max (veh)	Avg Speed (mph)	Spillback in Worst Lane (% of Peak Period)
EB	LT	1/ 2	24.9	0.0
	R	1/ 3	9.6	0.0
	All		18.4	0.0
WB	L	0/ 1	5.6	0.0
	TR	0/ 1	16.0	0.0
	All		13.0	0.0
NB	L	1/ 2	6.8	0.0
	TR	7/ 11	18.7	0.0
	All		18.6	0.0
SB	L	1/ 2	4.8	0.0
	TR	4/ 5	19.2	0.0
	All		19.0	0.0
Intersect.			18.7	



NETSIM Results for Case: DOOLCMPM Boyington Dr/Midway Road

CMAQ Improvements w/Exist. Traffic PM Peak Version 3.06

NETSIM Queue Statistics

App	Ln Grp	*Average Max. Q Per Cycle Per Lane (vehs)	*Max. Queue Per Lane (vehs)	*Max. Pct. Of Time That Q Overflows A Lane	Pct. Of Cycles With Turn Bay Overflow	Pct. Of Cycles Where Turner Can't Enter Bay Due To Queue Of Non-Turners	Animation Frame Showing Longest Queue
EB	LT	1	2	0.0			0:24
	R	1	3	0.0	0.0	0.0	5:03
WB	L	0	1	0.0	0.0	0.0	0:01
	TR	0	1	0.0			3:27
NB	L	1	2	0.0	0.0	7.7	3:02
	TR	7	11	0.0			6:50
SB	L	1	2	0.0	0.0	0.0	4:06
	TR	4	5	0.0			1:50

*These performance measures are also shown on summary statistics screen

NETSIM Results for Case: DOOLCMPM Boyington Dr/Midway Road

CMAQ Improvements w/Exist. Traffic PM Peak Version 3.06

NETSIM Environmental Statistics

Fuel Consumption

	Gallons			Miles Per Gallon		
	Autos	Trucks	Buses	Autos	Trucks	Buses
EB	0.4	0.0	0.0	18.5	15.6	0.0
WB	0.1	0.0	0.0	16.7	0.0	0.0
NB	9.4	0.2	0.0	14.4	5.3	0.0
SB	5.5	0.5	0.0	12.6	4.5	0.0
All	15.4	0.7	0.0	13.9	4.8	0.0

Auto Pollutant Emissions (Grams/Mile-Hour)

	HC	CO	NOX	RTOR Maneuvers Completed
EB	22.8	505.6	64.4	17
WB	10.4	168.3	24.8	0
NB	521.0	15069.0	1716.7	0
SB	318.1	11112.0	1155.7	0
All	254.0	7848.9	864.4	

APPENDIX C

Cost Estimates and Quantities

CMAQ Project 12 Budget

	Budget Amount	PS&E	ROW	*2.17% Off 0.0% On TxDOT Constr.	2.40% County Admin. TIP	8.52% Off 0.0% On TXDOT Constr.	5.5% Off 0.0% On TxDOT ROW	Amount Available for Constr./ Admin.	Schematic Constr. Cost Estimate	9.77% Off 0.0% On TxDOT Constr./ Admin.	Constr. Amount +/-
Trinity Mills at Midway	$ 750,000	$ 111,787	$ 248,184	$ 12,129	$ 18,000	$ -	$ -	$ 359,900	$ 558,937	$ 54,608	$ (253,645)
Spring Valley at Midway	$ 1,750,000	$ 88,679	$ 156,060	$ 9,622	$ 42,000	$ -	$ -	$ 1,453,640	$ 443,394	$ 43,320	$ 966,926
Keller Springs at Midway	$ 530,000	$ 58,573	$ 156,060	$ 6,355	$ 12,720	$ -	$ -	$ 296,292	$ 292,865	$ 28,613	$ (25,186)
Beltway at Midway	$ 55,000	$ 5,957	$ 12,204	$ 646	$ 1,320	$ -	$ -	$ 34,873	$ 29,785	$ 2,910	$ 2,178
Lindberg at Midway	$ 105,000	$ 11,716	$ 13,932	$ 1,271	$ 2,520	$ -	$ -	$ 75,560	$ 58,582	$ 5,723	$ 11,255
McEwen at Midway	$ 115,000	$ 18,863	$ 27,000	$ 2,047	$ 2,760	$ -	$ -	$ 64,330	$ 94,316	$ 9,215	$ (39,201)
Proton at Midway	$ 115,000	$ 20,678	$ 33,372	$ 2,244	$ 2,760	$ -	$ -	$ 55,946	$ 103,391	$ 10,101	$ (57,546)
Belmeade/Sojourn at Midway	$ 220,000	$ 33,578	$ 68,256	$ 3,643	$ 5,280	$ -	$ -	$ 109,243	$ 167,888	$ 16,403	$ (75,047)
Boyington/Dooley at Midway	$ 155,000	$ 11,096	$ 23,976	$ 1,204	$ 3,720	$ -	$ -	$ 115,004	$ 55,479	$ 5,420	$ 54,105
Totals:	$ 3,795,000	$ 360,927	$ 739,044	$ 39,161	$ 91,080	$ -	$ -	$ 2,564,788	$ 1,804,637	$ 176,313	$ 583,838

Midway Road Corridor Intersection Improvements
Design Cost Estimate
Design, Construction, and R.O.W. Acquisition
Midway at Spring Valley

Date: 7/11/97

Item Description	Unit	Unit Price	Quantity	Amount	TXDOT Item #
I. Demolition & Construction					
Mobilization	LS	$5,000.00	1	$ 5,000	
Remove Existing Sidewalk	M^2	$3.25	271	$ 881	1040513
Remove Existing Curb and gutter	M	$7.35	616	$ 4,528	
Landscaping (Irrg., Trees, Sod)	LS	$2,300.00	1	$ 2,300	
Remove & Replace Mast Arm Pole	EA	$4,500.00	8	$ 36,000	50305003
Adjust Manhole	EA	$500.00	2	$ 1,000	
Relocate Controller Cabinet	EA	$2,500.00	5	$ 12,500	
Sawcut Existing Pavement	M	$5.95	1520	$ 9,044	53630521
Relocate Fire Hydrant	EA	$1,000.00	2	$ 2,000	
Remove & Replace Curb Inlet	EA	$3,000.00	4	$ 12,000	3600503
8" Reinf. Conc. Pavement (Incl. base matl.)	M^2	$40.00	3640	$ 145,600	5290504
6" Reinf. Conc. Curb & Gutter	M	$28.00	585	$ 16,380	
4" Reinf. Conc. Sidewalk	M^2	$30.00	271	$ 8,130	
ADA Ramp	EA	$500.00	6	$ 3,000	
Pavement Markings and Signage	LS	$5,000.00	1	$ 5,000	
Traffic Control	LS	$3,000.00	1	$ 3,000	
Laydown Curb	M	$40.00	64	$ 2,560	
Remove Existing Pavement	M^2	$4.20	2703	$ 11,353	
Relocate Water Box	EA	$750.00	1	$ 750	53440505
Relocate Traffic Sign	EA	$300.00	5	$ 1,500	6445006
Relocate Power Pole	EA	$1,800.00	8	$ 14,400	
Relocate Light Pole	EA	$2,000.00	5	$ 10,000	
Relocate Electric Meter	EA	$2,200.00	1	$ 2,200	
Relocate Large Mobil Sign	EA	$1,500.00	1	$ 1,500	
Relocate Electric Box	EA	$750.00	1	$ 750	
Concrete Driveway	M^2	$23.41	206	$ 4,822	
Concrete Median	M^2	$30.00	405	$ 12,150	
Build Retaining Wall	M^2	$300.00	137.16	$ 41,148	
Subtotal Demolition and Construction				$ 369,495	
Demolition and Construction Contingency (20%)				$ 73,899	
Total Demolition & Construction				$ 443,394	
II. Right-of-way Acquisition					
Residential	M^2	$54.00	0	$ -	
Commercial/Retail	M^2	$108.00	1445	$ 156,060	
Total R.O.W. Acquistion				$ 156,060	
III. Design (PS&E) (20%)				$ 88,679	

Midway Road Corridor Intersection Improvements
Design Cost Estimate
Design, Construction, and R.O.W. Acquisition
Midway at Keller Springs

Date: 7/11/97

Item Description	Unit	Unit Price	Quantity	Amount	TXDOT Item #
I. Demolition & Construction					
Mobilization	LS	$5,000.00	1	$ 5,000	
Remove Existing Curb and gutter	M	$7.35	165	$ 1,213	
Landscaping (Irrg., Trees, Sod)	LS	$2,300.00	1	$ 2,300	
Replace Traffic Signal System	EA	$80,000.00	1	$ 80,000	50305003
Sawcut Existing Pavement	M	$5.95	897	$ 5,337	53630521
Relocate Fire Hydrant	EA	$1,000.00	3	$ 3,000	
Remove & Replace Curb Inlet	EA	$3,000.00	1	$ 3,000	3600503
8" Reinf. Conc. Pavement (Incl. base matl.)	M^2	$40.00	2600	$ 104,000	5290504
6" Reinf. Conc. Curb & Gutter	M	$28.00	589	$ 16,492	
Pavement Markings and Signage	LS	$5,000.00	1	$ 5,000	
Traffic Control	LS	$3,000.00	1	$ 3,000	
Laydown Curb	M	$40.00	10	$ 400	
Remove Existing Pavement	M^2	$4.20	660	$ 2,772	
Relocate Traffic Sign	EA	$300.00	11	$ 3,300	6445006
Relocate Power Pole	EA	$1,800.00	2	$ 3,600	
Relocate Electric Box	EA	$750.00	1	$ 750	
Concrete Median	M^2	$30.00	156	$ 4,680	
Install Traffic Buttons	EA	$15.00	14	$ 210	
Subtotal Demolition and Construction				$ 244,054	
Demolition and Construction Contingency (20%)				$ 48,811	
Total Demolition & Construction				$ 292,865	
II. Right-of-way Acquisition					
Residential	M^2	$54.00	0	$ -	
Commercial/Retail	M^2	$108.00	1445	$ 156,060	
Total R.O.W. Acquistion				$ 156,060	
III. Design (PS&E) (20%)				$ 58,573	

Midway Road Corridor Intersection Improvements
Design Cost Estimate
Design, Construction, and R.O.W. Acquisition
Midway at Beltway

Date: 7/11/97

Item Description	Unit	Unit Price	Quantity	Amount	TXDOT Item #
I. Demolition & Construction					
Mobilization	LS	$3,000.00	1	$ 3,000	
Remove Existing Sidewalk	M^2	$3.25	46	$ 150	1040513
Remove Existing Curb and gutter	M	$7.35	91	$ 669	
Landscaping (Irrg., Trees, Sod)	LS	$800.00	1	$ 800	
Sawcut Existing Pavement	M	$5.95	106	$ 631	53630521
8" Reinf. Conc. Pavement (Incl. base matl.)	M^2	$40.00	221	$ 8,840	5290504
6" Reinf. Conc. Curb & Gutter	M	$28.00	85	$ 2,380	
4" Reinf. Conc. Sidewalk	M^2	$30.00	46	$ 1,380	
Pavement Markings and Signage	LS	$1,000.00	1	$ 1,000	
Traffic Control	LS	$800.00	1	$ 800	
Remove Existing Pavement	M^2	$4.20	517	$ 2,171	
Relocate Water Valve	EA	$600.00	2	$ 1,200	50375004
Relocate Power Pole	EA	$1,800.00	1	$ 1,800	
Subtotal Demolition and Construction				$ 24,820	
Demolition and Construction Contingency (20%)				$ 4,964	
Total Demolition & Construction				$ 29,785	
II. Right-of-way Acquisition					
Residential	M^2	$54.00	0	$ -	
Commercial/Retail	M^2	$108.00	113	$ 12,204	
Total R.O.W. Acquistion				$ 12,204	
III. Design (PS&E) (20%)				$ 5,957	

Midway Road Corridor Intersection Improvements
Design Cost Estimate
Design, Construction, and R.O.W. Acquisition
Midway at Linberg

Date: 7/11/97

Item Description	Unit	Unit Price	Quantity	Amount	TXDOT Item #
I. Demolition & Construction					
Mobilization	LS	$3,000.00	1	$ 3,000	
Remove Existing Curb and gutter	M	$7.35	123	$ 904	
Landscaping (Irrg., Trees, Sod)	LS	$1,500.00	1	$ 1,500	
Remove and Replace Mast Arm and Pole	EA	$4,500.00	1	$ 4,500	
Relocate Controller Cabinet	EA	$2,500.00	3	$ 7,500	50305003
Sawcut Existing Pavement	M	$5.95	278	$ 1,654	53630521
Relocate Fire Hydrant	EA	$1,000.00	1	$ 1,000	
Remove & Replace Curb Inlet	EA	$3,000.00	1	$ 3,000	3600503
8" Reinf. Conc. Pavement (Incl. base matl.)	M^2	$40.00	277	$ 11,080	5290504
6" Reinf. Conc. Curb & Gutter	M	$28.00	111	$ 3,108	
Pavement Markings and Signage	LS	$3,000.00	1	$ 3,000	
Traffic Control	LS	$2,000.00	1	$ 2,000	
Laydown Curb	M	$40.00	5	$ 200	
Remove Existing Pavement	M^2	$4.20	160	$ 672	
Relocate Traffic Sign	EA	$300.00	1	$ 300	6445006
Relocate Power Pole	EA	$1,800.00	3	$ 5,400	
Subtotal Demolition and Construction				$ 48,818	
Demolition and Construction Contingency (20%)				$ 9,764	
Total Demolition & Construction				$ 58,582	
II. Right-of-way Acquisition					
Residential	M^2	$54.00	0	$ -	
Commercial/Retail	M^2	$108.00	129	$ 13,932	
Total R.O.W. Acquistion				$ 13,932	
III. Design (PS&E) (20%)				$ 11,716	

Midway Road Corridor Intersection Improvements
Design Cost Estimate
Design, Construction, and R.O.W. Acquisition
Midway at Proton

Date: 7/11/97

Item Description	Unit	Unit Price	Quantity	Amount
I. Demolition & Construction				
Mobilization	LS	$3,000.00	1	$ 3,000
Remove Existing Sidewalk	M^2	$3.25	140	$ 455
Remove Existing Curb and gutter	M	$7.35	268	$ 1,970
Landscaping (Irrg., Trees, Sod)	LS	$1,200.00	1	$ 1,200
Remove & Replace Mast Arm Pole	EA	$4,500.00	2	$ 9,000
Relocate Controller Cabinet	EA	$2,500.00	4	$ 10,000
Adjust Manhole	EA	$500.00	2	$ 1,000
Sawcut Existing Pavement	M	$5.95	286	$ 1,702
Relocate Fire Hydrant	EA	$1,000.00	1	$ 1,000
Remove & Replace Curb Inlet	EA	$3,000.00	2	$ 6,000
8" Reinf. Conc. Pavement (Incl. base matl.)	M^2	$40.00	640	$ 25,600
6" Reinf. Conc. Curb & Gutter	M	$28.00	253	$ 7,084
4" Reinf. Conc. Sidewalk	M^2	$30.00	140	$ 4,200
ADA Ramp	EA	$500.00	1	$ 500
Pavement Markings and Signage	LS	$2,500.00	1	$ 2,500
Traffic Control	LS	$1,800.00	1	$ 1,800
Laydown Curb	M	$40.00	1	$ 40
Remove Existing Pavement	M^2	$4.20	784	$ 3,293
Relocate Water Meter	EA	$750.00	1	$ 750
Relocate Water Valve	EA	$600.00	2	$ 1,200
Relocate Traffic Sign	EA	$300.00	1	$ 300
Concrete Driveway	M^2	$23.41	37	$ 866
Remove & Replace Harvey Sign and Light	LS	$1,200.00	1	$ 1,200
Concrete Median	M^2	$30.00	50	$ 1,500
Subtotal Demolition and Construction				$ 86,159
Demolition and Construction Contingency (20%)				$ 17,232
Total Demolition & Construction				$ 103,391
II. Right-of-way Acquisition				
Residential	M^2	$54.00	0	$ -
Commercial/Retail	M^2	$108.00	309	$ 33,372
Total R.O.W. Acquistion				$ 33,372
III. Design (PS&E) (20%)				$ 20,678

Midway Road Corridor Intersection Improvements
Design Cost Estimate
Design, Construction, and R.O.W. Acquisition
Midway at Boyington

Date: 7/11/97

Item Description	Unit	Unit Price	Quantity	Amount	TXDOT Item #
I. Demolition & Construction					
Mobilization	LS	$3,000.00	1	$ 3,000	
Remove Existing Curb and gutter	M	$7.35	146	$ 1,073	
Landscaping (Irrg., Trees, Sod)	LS	$1,600.00	1	$ 1,600	
Sawcut Existing Pavement	M	$5.95	166	$ 988	53630521
Remove & Replace Curb Inlet	EA	$3,000.00	1	$ 3,000	3600503
4" Reinf. Conc. Median Pavement	M^2	$20.00	532	$ 10,640	
8" Reinf. Conc. Pavement (Incl. base matl.)	M^2	$40.00	268	$ 10,720	5290504
6" Reinf. Conc. Curb & Gutter	M	$28.00	139	$ 3,892	
Pavement Markings and Signage	LS	$3,000.00	1	$ 3,000	
Traffic Control	LS	$2,000.00	1	$ 2,000	
Laydown Curb	M	$40.00	20	$ 800	
Remove Existing Pavement	M^2	$4.20	100	$ 420	
Relocate Traffic Sign	EA	$300.00	3	$ 900	6445006
Relocate Power Pole	EA	$1,800.00	1	$ 1,800	
Install Traffic Buttons	EA	$15.00	60	$ 900	
Concrete Median	M^2	$30.00	50	$ 1,500	
Subtotal Demolition and Construction				$ 46,233	
Demolition and Construction Contingency (20%)				$ 9,247	
Total Demolition & Construction				$ 55,479	
II. Right-of-way Acquisition					
Residential	M^2	$54.00	0	$ -	
Commercial/Retail	M^2	$108.00	222	$ 23,976	
Total R.O.W. Acquistion				$ 23,976	
III. Design (PS&E) (20%)				$ 11,096	