Coalfields Expressway Location Study
Project R000-961-101, PE-100

TRAFFIC ANALYSIS SUMMARY REPORT

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1.0 EXISTING TRAFFIC CONDITIONS

1.1 Existing Facilities

General Characteristics

The transportation system within the Coalfields Expressway Study Area is comprised almost entirely of narrow, winding, two-lane roads. The Coalfields Expressway Study Area is illustrated in Figure 1. The exceptions are U.S. Route 460, which has some sections of 4 and 5 lanes through Grundy; Route 83, which has additional truck climbing lanes in certain areas; and U.S. Route 23 around Pound, which is a high capacity four-lane divided highway. There are no public transportation systems within the Study Area. Several rail lines fall within the Study Area, but they serve only as freight lines.

Most of the roads of the region are characterized by steep grades, sharp curves, and narrow to nonexistent shoulders. Private entrances are located along all of the roads, including Primary Routes 63, 80, 83, and 460. Travel through the region is difficult and time consuming since passing opportunities are few and coal trucks are plentiful.

Existing Facilities

Due to the constraints presented by the rugged topography prevalent in the study area, the number of major roads is small. Primary routes carry the bulk of the traffic, but are not constructed to the standard of most primary roads in other parts of the state. They include the following:

Route 83 serves as the primary east-west route between Pound, Virginia and Bradshaw, West Virginia. Route 83 in Virginia passes through the towns of Clintwood, Haysi, and Grundy and the communities of Clinchco, Prater, Vansant, Tookland, Slate, and Paynesville. The road serves as both the regional transportation link and a commercial access road, with development close to the edge of the road on both sides in many areas. The more rural stretches often run parallel to streams and rivers, such as McClure River, Prater Creek, the Levisa Fork River, and Slate Creek.

U.S. Route 460 is a major transportation link between Bluefield Virginia/West Virginia and Pikeville, Kentucky. This highway, with both four-lane and two-lane sections, is the major east-west link in the eastern part of the Study Area. It serves the communities of Grundy, Vansant, Oakwood, Richlands, Claypool Hill, and Tazewell.

U.S. Route 23 serves as the primary north-south highway in the western section of the Study Area. This route connects to Jenkins, Kentucky and Kingsport and I-81 in Tennessee. It is a four-lane divided highway that has been upgraded in recent years. U.S. Route 23 passes through the communities of Wise, Norton, Big Stone Gap, and Duffield, and Weber City. Most of the through traffic in the western part of the Study Area is destined to or originates from U.S. Route 23 south of Pound.

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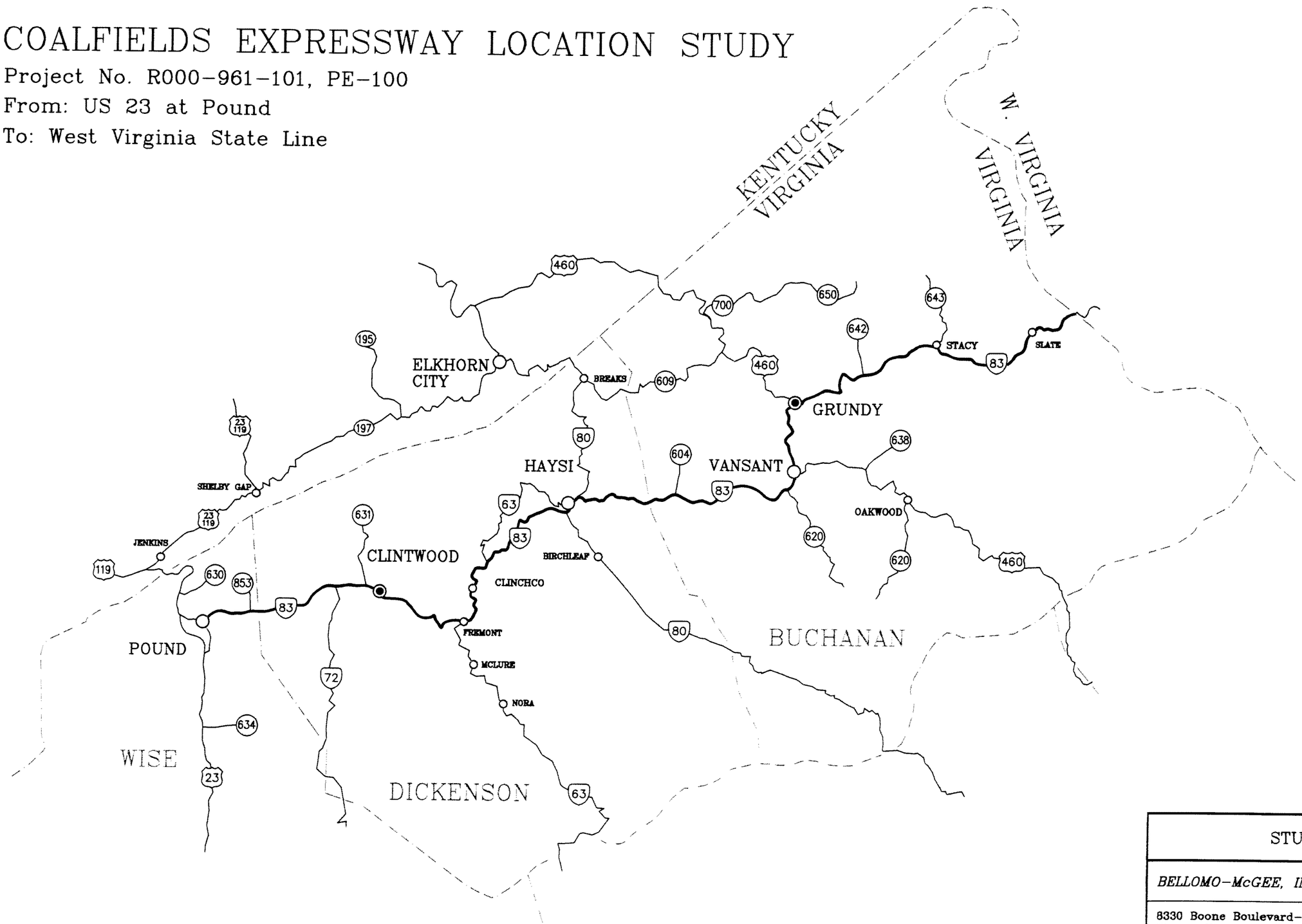

STUDY AREA

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Figure 1

Approx. Scale:
1" = 4.5 miles

Route 80 is a north-south highway running through the middle of the Study Area. It connects Elkhorn City, Kentucky to U.S. Route 19 in Virginia, passing through the communities of Haysi, Birchleaf, Davenport, and Honaker. Route 80 also serves as the primary access road to the Breaks Interstate Park.

Route 72 is a north-south highway connecting Route 83 just west of Clintwood to Kingsport, Tennessee, passing through the communities of Toms Creek, Coeburn, Dungannon, Fort Blackmore, and Weber City.

Route 63 is a significant north-south roadway serving the western and central parts of the Study Area. It ties the community of St. Paul to Haysi, passing through Nora, McClure, Freemont, Clinchco and Tarpon. Route 63 shares the alignment of Route 83 between Freemont and Clinchco, where it crosses the McClure River and follows Big Ridge. It serves a number of residential communities located along the ridgetops west of the Russell Fork River.

Several secondary routes serve as critical connectors for communities within the Study Area. Those most impacted by the Coalfields Expressway Alternatives include the following:

Route 637 follows Big Ridge from Bearpen Gap to Tarpon, serving a number of residential communities in western Dickenson County.

Route 609 runs east-west between the Breaks Interstate Park and Harmon Junction along U.S. Route 460 north of Grundy. It passes through Bull Gap and the communities of Harmon and Maxie.

Routes 643/640 run north-south and serve as the main connection between the Hurley, Stacy, and Slate communities in eastern Buchanan County. It serves as a shortcut for U.S. Route 460 south to Tazewell County.

Field Observations

During data collection activities in August 1997, BMI field crews made several observations regarding the operational characteristics of the existing alignment of Route 83 and other relevant study area features. Perhaps the most prevailing observation was the variation of shoulder width, clear zone width, design speed, and curve warning signage. Much of this variation is attributable to the severe topography of the area that dictates the alignment of the roadway. In addition, there appeared to be no access control restricting the frequency or location of driveways or side streets. Coal mining, an industrial base of the area, results in a significant proportion of coal trucks using VA 83 to transport coal from the mines to rail transfer facilities. The following sections highlight the key observations made along five subsections of the Route 83 study corridor.

Segment 1: Pound (Business US 23) to Clintwood (SSR 631)

Queues of 20 to 30 vehicles were observed several times at the intersection of VA 83 and Business US 23 (VA 83 is stop-controlled) in the center of Pound. The section from Pound to Clintwood allows travel speeds averaging 43 miles per hour (mph), the highest average speed

attainable throughout the Route 83 corridor. This section also has severe changes in vertical grade, necessitating the use of truck climbing lanes. These climbing lanes have a profound impact on traffic operations and attainable average speeds. Improvements to increase vehicle speed and throughput should concentrate on the location and length of truck climbing lanes, especially the need to add a lane in the downhill direction.

Segment 2: Clintwood (SSR 631) to Haysi (Route 80 South)

This section also contains severe changes in vertical grade, with truck climbing lanes at two locations. This segment is much more curvilinear than the first, reducing average speeds to slightly over 40 mph. There is a sharp change in vertical alignment and curvature on the east edge of Clintwood at the Route 1001 intersection. To an unfamiliar driver traveling westbound, VA 83 appears to go straight at Route 1001, but the road actually makes a sharp left turn along a short downgrade into Clintwood. The only visual cue for this turn is a small VA 83 plaque with an arrow on the north side of the intersection. Unfamiliar drivers, however, are likely to be a very small portion of the driving population and the intersection was planned for reconstruction. The intersection with Route 637 appears to have limited intersection sight distance. The accident frequency (5 in 3 years), however, is not considered to be abnormally high. Similar to Segment 1, improvements should be considered to improve truck climbing lanes, including adding a lane in the downgrade direction.

Segment 3: Haysi (80 South) to Vansant (460E)

Segment 3 begins with a 1.5 mile section that contains three intersections with VA 80S, VA 63, and VA 80N. To remain on VA 83 while traveling eastbound, a driver must make a left-turn and two right turns, each at stop-controlled intersections. These stops and turns significantly increase the travel time for drivers wishing to go east to Vansant. The intersection with Route 718, leading to the Grundy municipal airport, also appeared to have limited intersection sight distance. The site had only three reported accidents in the past three years, which is not an abnormally high number. The segment also has a large number of sharp curves, reducing average vehicle speeds to approximately 35 mph. Changes in vertical grade are less severe, and truck climbing lanes are not found within this segment. Operational improvements could strive to increase the route continuity through Haysi by reducing or eliminating the number of turns required to remain on VA 83.

Segment 4: Vansant (460E) to Grundy (460W)

VA 83 and US 460 overlap for the entire length of this 4.2 mile segment, most of which falls within the corporate limits of Grundy. A one-mile section immediately North of Vansant to the Southern corporate limits of Grundy was recently widened from two lanes to a four-lane curb and gutter section. Within Grundy, the section is two-lane with on-street parking along much of its length. The Northern half mile of the section is a couplet with two lanes in each direction through downtown Grundy. Speeds are limited to 25 to 30 mph in this section due to the increased development density, frequency of access points, and on-street parking. The level of congestion on this segment, relative to all other sections of VA 83, is the highest.

The Buchanan General Hospital appears to be the largest traffic generator along VA 83 to the East of Grundy. The road alignment is highly curvilinear, with many curves requiring the driver to reduce speed to 35 to 40 mph. The section adjacent to West Virginia consists of a three-mile long ascent to the top of the mountain ridge that defines the border between the two states. While this grade appears significant enough to warrant a truck climbing lane, the low proportion of trucks in the traffic stream combined with total traffic volumes of only 1,500 ADT (VDOT 1995 count) probably does not justify such an improvement.

1.2 Traffic Data

Overview

BMI and Chi Associates, Inc. conducted an extensive field study of existing traffic conditions along the Coalfields Expressway Corridor from August 15, 1997 to August 21, 1997. Data were collected along Virginia State Highway 83 (VA 83) between the intersection of Business 23 in Pound and the West Virginia State Line. Data collection activities included tube counts, intersection turning movement counts using manual and video surveillance methods, license plate surveys, and travel time measurements. Travel time measurements were also made along adjacent and parallel roadways to provide a comparison among alternate routes between major points within the corridor.

Raw data for the link tube counts are presented in Appendix A. Data from the manual intersection counts are given in Appendix B while Appendix C contains data from the video surveillance counts. Appendix D contains vehicle classification data obtained through the video surveillance counts. Finally, Appendix E presents the data from travel time measurements used to determine average speeds through various segments of the corridor.

Traffic Data Collection Plan

Figure 2 shows the geographic distribution of the intersection and tube counts, including the location of the license plate surveys. The duration of each field survey is summarized in Table 1. Tube counters were installed at eight locations along VA 83 (T-1 through T-8 in Figure 2). Tubes were installed at the entrances to four additional sites in the corridor which appeared to potentially generate relatively large traffic volumes. These locations included two entrances to Buchanan General Hospital (T-9,T-10), the driveway of the Buchanan Information Park (T-11), and the access road to Breaks Interstate Park (T-12). Weekday intersection counts using video surveillance were made at seven locations along VA 83 for a single twelve-hour period, approximately 8:00 AM to 8:00 PM. Twelve-hour video counts were also conducted over a three-day period (Friday, Saturday, Sunday) at three locations near Breaks Interstate Park (V-8, V-9, and V-10 in Figure 2). Manual turning movement counts were conducted on a weekday at five locations. Traffic was measured at 15-minute intervals from 8:00 to 11:00 AM and 3:00 to 6:00 PM. License plate surveys were conducted for a single eight-hour period starting at 8:00 to 9:30 AM and ending between 4:30 and 6:00 PM. Finally, travel time runs were made at various times of the day throughout the seven days of data collection.

COALFIELDS EXPRESSWAY LOCATION STUDY

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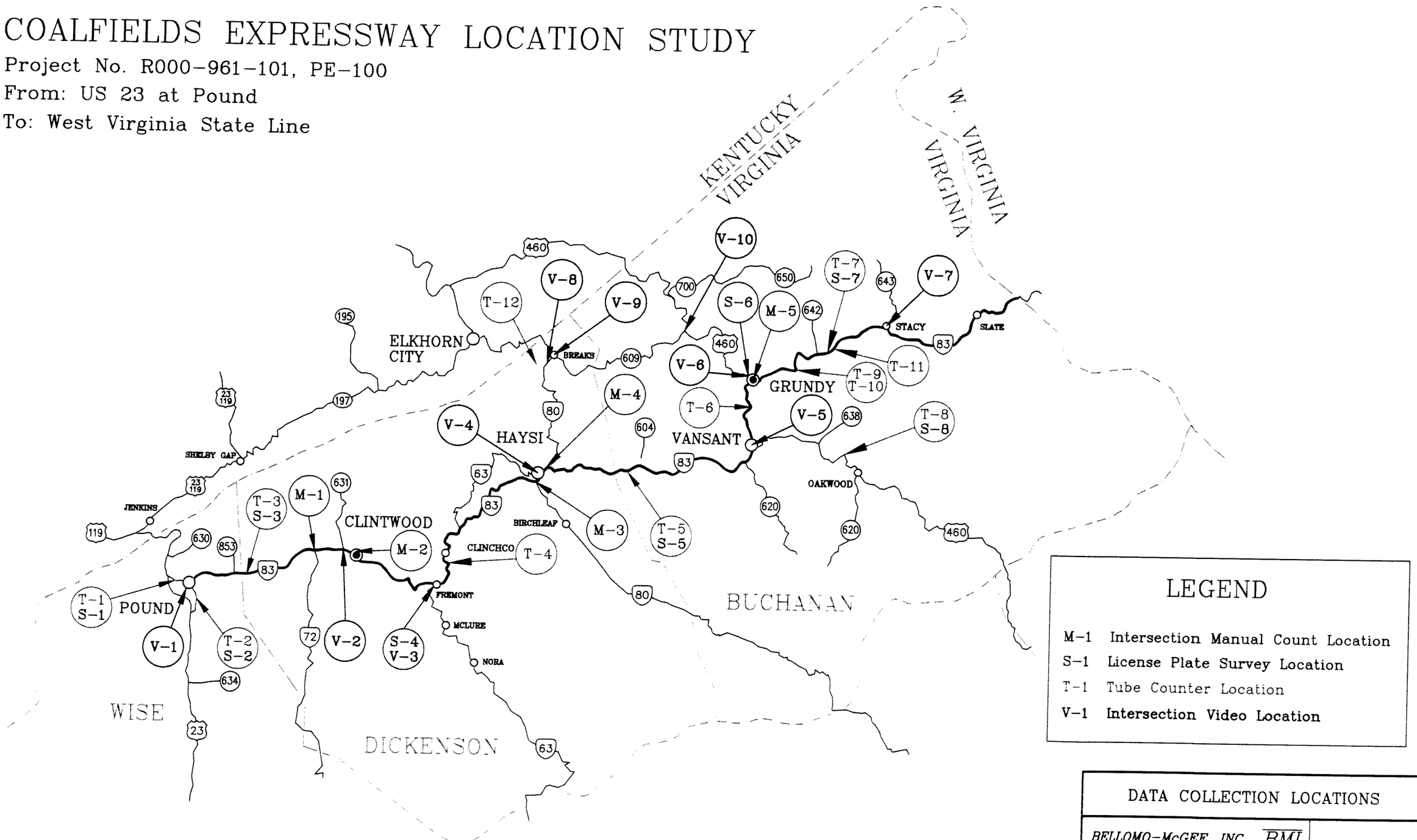

DATA COLLECTION LOCATIONS

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Figure 2

Approx. Scale:
1" = 4.5 miles

Table 1. Traffic Data Collection Plan Summary

Type	Map Code*	Location	Time Period
Tube	T-1	US 23 Business - North	Weekdays - 48 hours
	T-2	US 23 Business - South	Weekdays - 48 hours
	T-3	VA 83 @ Wise/Dickenson Co. Line	Weekdays - 48 hours
	T-4	VA 83/63 between SR 779 and SR 664	Weekdays - 48 hours
	T-5	VA 83 @ Prater	Weekdays - 48 hours
	T-6	VA 83/US 460 between Vansant and Grundy	Weekdays - 48 hours
	T-7	VA 83 between SR 642 and SR 674	Weekdays - 48 hours
	T-8	US 460 between Vansant and Oakwood	Weekdays - 48 hours
	T-9	Buchanan General Hospital (West Access)	Weekdays - 48 hours
	T-10	Buchanan General Hospital (East Access)	Weekdays - 48 hours
	T-11	Buchanan Information Park	Weekdays - 48 hours
	T-12	Entrance to Breaks Interstate Park	Weekday/Weekend - 96 hours
Intersection - Video	V-1	VA 83 @ US 23 Business (Pound)	Weekday - 12 hours
	V-2	VA 83 @ SR 631 (Clintwood)	Weekday - 12 hours
	V-3	VA 83 @ VA 63 (Fremont)	Weekday - 12 hours
	V-4	VA 83/80 @ VA 63 (Haysi)	Weekday - 12 hours
	V-5	VA 83 @ US 460 (Vansant)	Weekday - 12 hours
	V-6	VA 460 @ VA 83 Business (Grundy)	Weekday - 12 hours
	V-7	VA 83 @ SR 643 (Stacy)	Weekday - 12 hours
	V-8	VA 80 @ Entrance to Breaks Interstate Park	Weekend - 36 hours
	V-9	VA 80 @ SR 609	Weekend - 36 hours
	V-10	US 460 @ SR 609	Weekend - 36 hours

* See Figure 2.

Table 1. Traffic Data Collection Plan Summary (cont'd)

Type	Map Code*	Location	Time Period
Intersection - Manual	M-1	VA 83 @ VA 72 (Georges Fork)	Weekday - 6 hours
	M-2	VA 83 @ T-607 (Clintwood)	Weekday - 6 hours
	M-3	VA 83 @ VA 80 South (Haysi)	Weekday - 6 hours
	M-4	VA 83 @ VA 80 North (Haysi)	Weekday - 6 hours
	M-5	US 460 @ VA 83 @ VA 83/US 460 (Grundy)	Weekday - 6 hours
License Plate Survey	S-1	US 23 Business - North	Weekday - 8 hours
	S-2	US 23 Business - South	Weekday - 8 hours
	S-3	US 83 @ Wise/Dickenson Co. Line	Weekday - 8 hours
	S-4	VA 83 @ Fremont	Weekday - 8 hours
	S-5	VA 83 @ Prater	Weekday - 8 hours
	S-6	US 460 west of Grundy	Weekday - 8 hours
	S-7	VA 83 between SR 642 and SR 674	Weekday - 8 hours
	S-8	US 460 between Vansant and Oakwood	Weekday - 8 hours
Travel Time/ Speed Data		VA 63, VA 72, VA 80, VA 83, SR 609, SR 631, SR 662, US 23, US 460, KY 197	All Periods

* See Figure 2.

1.2.1 Traffic Volume Data

Tube Counts

Mechanical tube counters were installed and maintained by Chi Associates at eight locations along VA 83 and at the access points to four additional sites within the corridor. All tubes were in place for a minimum period of 48 consecutive hours on two weekdays. In addition, weekend counts were obtained at the entrance to Breaks Interstate Park. Figure 3 shows the average weekday traffic (ADT) at eight locations along VA 83. Table 2 displays the volumes recorded by each of the twelve tube counters. The values listed in Figure 3 and Table 2 represent the average traffic volume in both directions over a 24-hour period. The raw data downloaded from the tube counters to a computer can be found in Appendix A. The time of the peak hour and the peak volumes (by direction) are also computed at the bottom of each sheet in Appendix A.

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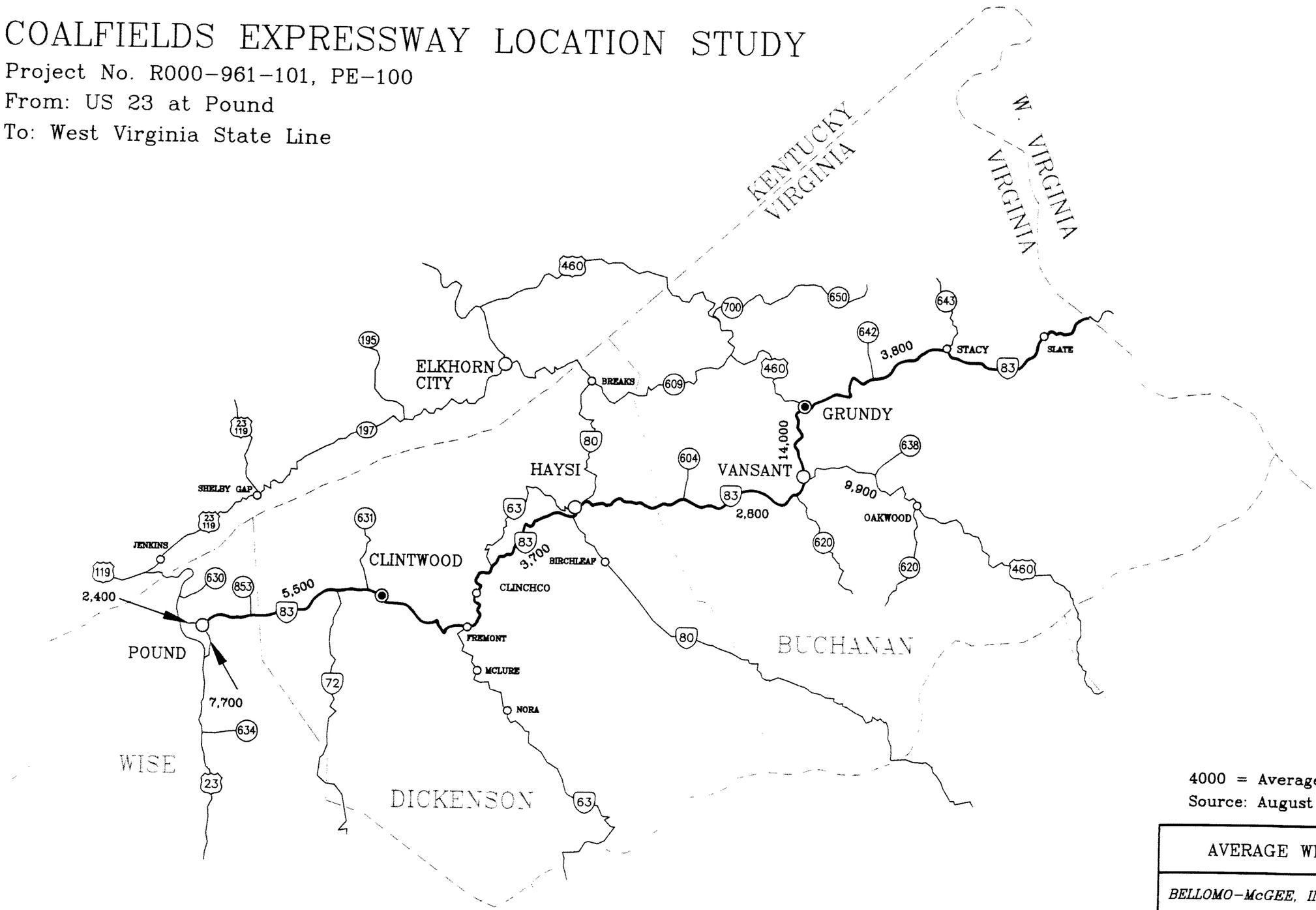

4000 = Average Weekday Traffic
Source: August 1997 Counts

AVERAGE WEEKDAY TRAFFIC

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Figure 3

Approx. Scale:
1" = 4.5 miles

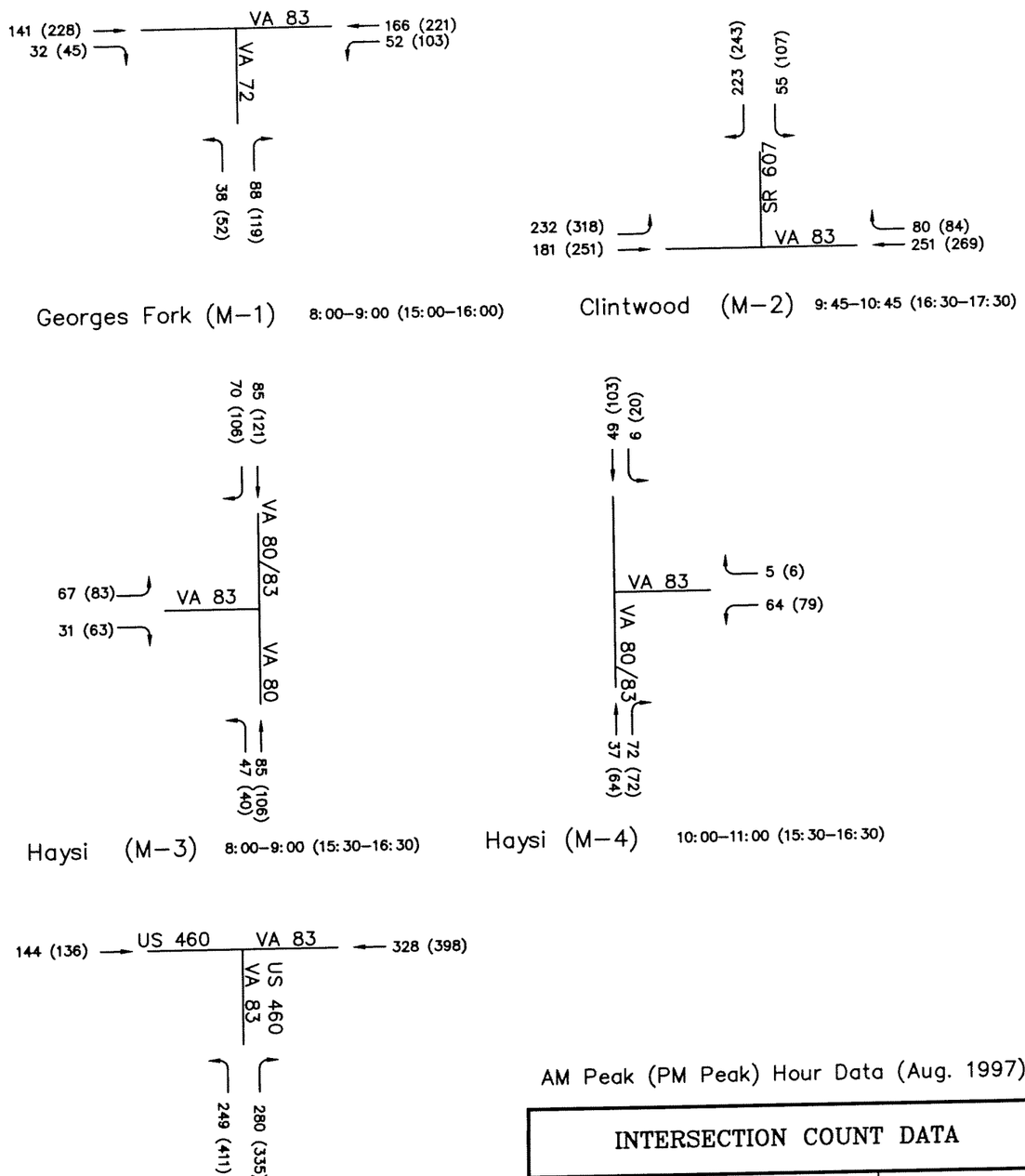
Table 2. Average Daily Traffic

Map Code*	Location	Average Weekday Traffic
T-1	US 23 Business - North	2,400
T-2	US 23 Business - South	7,700
T-3	VA 83 @ Wise/Dickenson Co. Line	5,500
T-4	VA 83/63 between SR 779 and SR 664	3,700
T-5	VA 83 @ Prater	2,800
T-6	VA 83/US 460 between Vansant and Grundy	14,000
T-7	VA 83 between SR 642 and SR 674	3,800
T-8	US 460 between Vansant and Oakwood	9,900
T-9	Buchanan General Hospital (West Access)	1,400
T-10	Buchanan General Hospital (East Access)	2,200
T-11	Buchanan Information Park	400
T-12	Entrance to Breaks Interstate Park	500 (Weekend: 1,900)

* See Figure 2.

Intersection Counts

Manual turning movement counts were conducted by Chi Associates at five intersections on Tuesday, August 19, 1997. Traffic was measured at 15-minute intervals from 8:00 to 11:00 AM and 3:00 to 6:00 PM. Video turning movement counts were conducted by BMI and Chi Associates at seven intersections along VA 83 between August 19 and August 21, 1997. Traffic was measured at 15-minutes intervals from approximately 8:00 AM to 8:00 PM. Twelve-hour video counts were also conducted for a three-day weekend period at three locations near Breaks Interstate Park. BMI mounted surveillance cameras on utility poles or sign posts to achieve a continuous, wide angle view of each intersection. The 12-hour observation period was recorded on a 2-hour time lapse VHS tape. The tapes were reduced by Chi Associates who summarized turning movements by viewing the surveillance tapes. Figure 4 shows the time of the AM and PM peak hour periods and the traffic volumes for each turning movement at the fifteen intersections. Table 3 summarizes the peak period volumes based on the total number of vehicles entering the intersection. The volumes and associated times for the two hours of the day with the largest traffic volumes in either the morning or afternoon/evening periods are listed. It is important to note that many of the video surveillance sites do not seem to experience a typical AM and PM peak period. The actual data sheets for the manual and video turning movement counts can be found in Appendices B and C, respectively.



AM Peak (PM Peak) Hour Data (Aug. 1997)

INTERSECTION COUNT DATA

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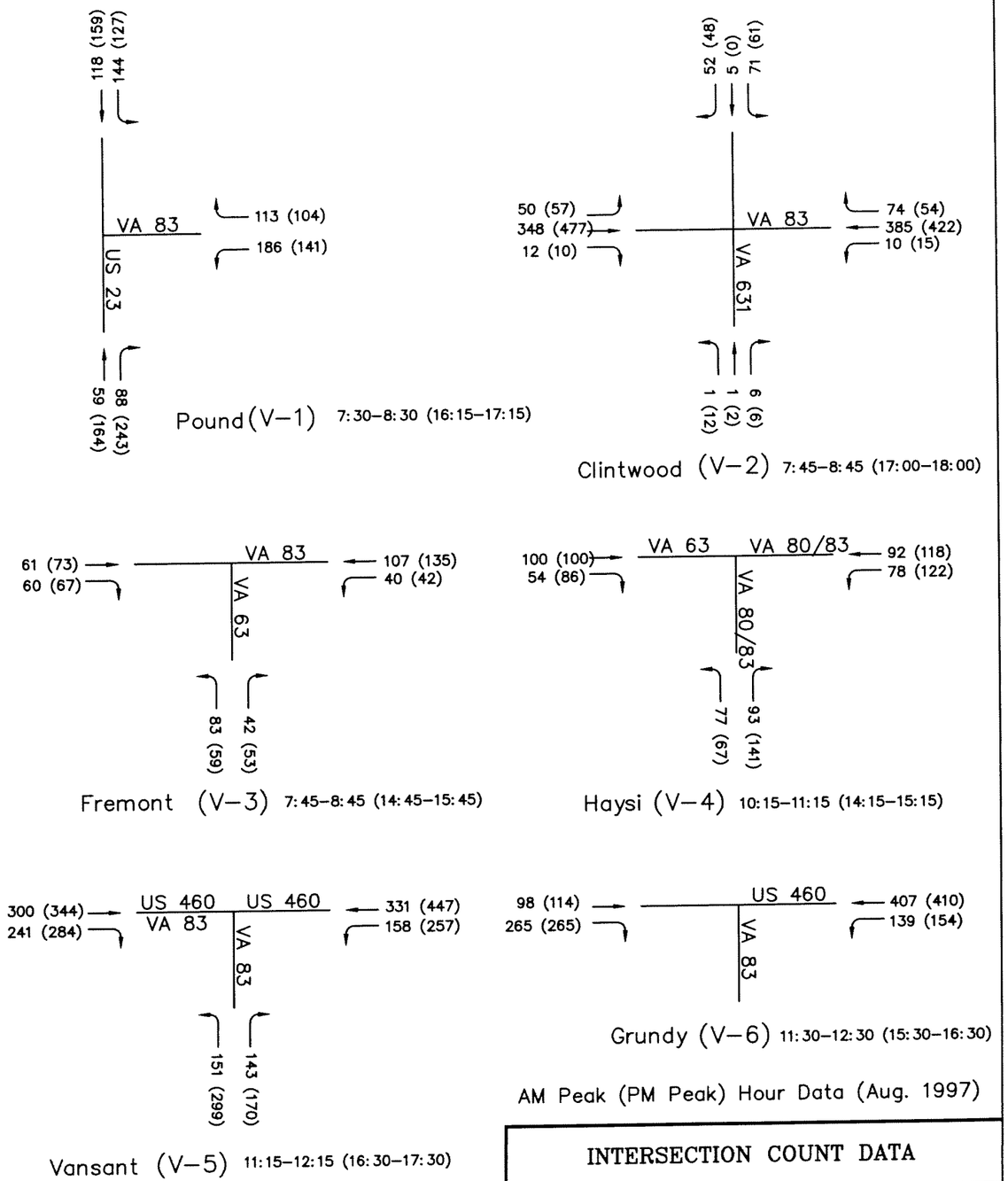
Figure 4



AM Peak (PM Peak) Hour Data (Aug. 1997)

INTERSECTION COUNT DATA

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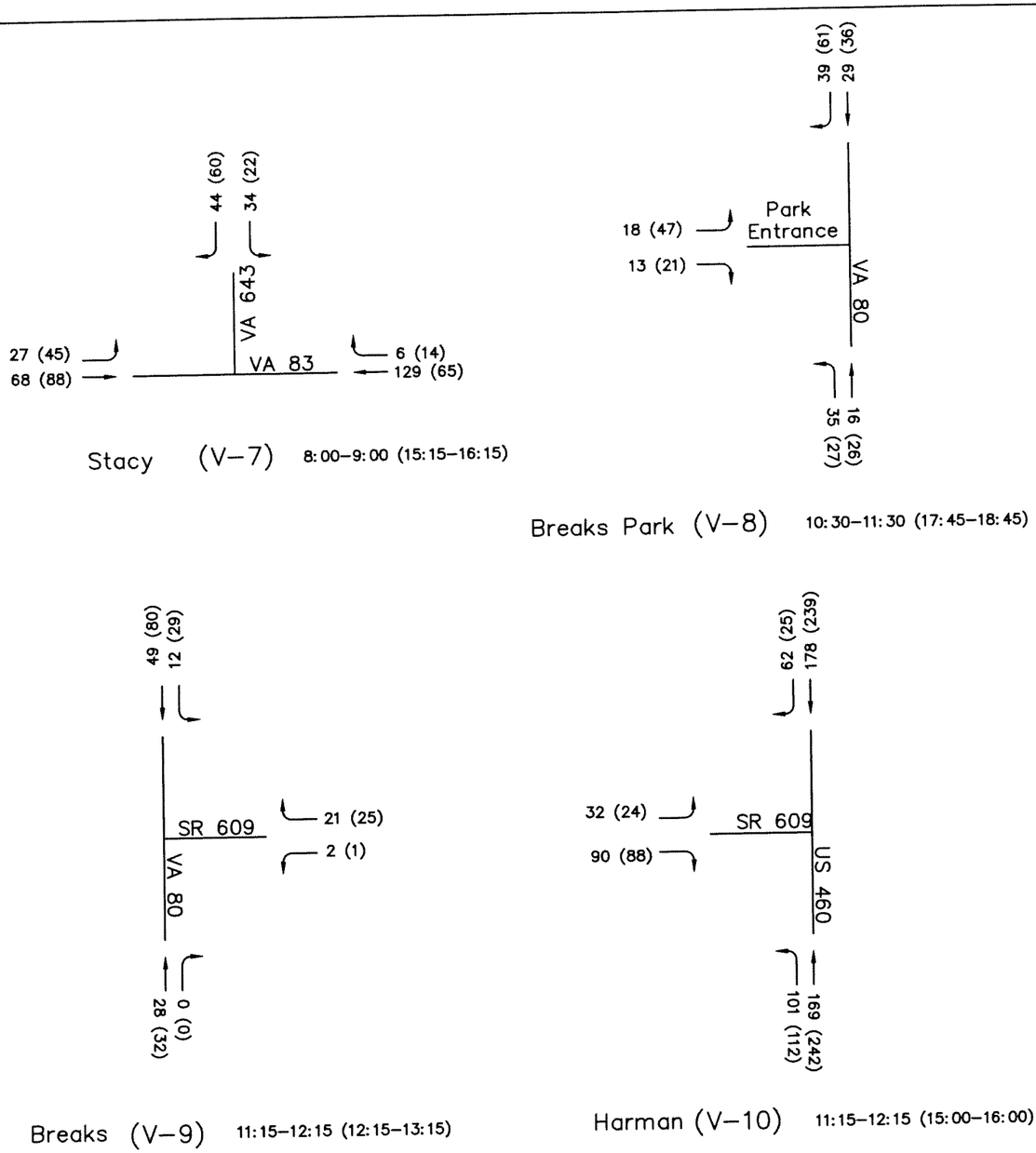
Figure 4 (cont.)



AM Peak (PM Peak) Hour Data (Aug. 1997)

INTERSECTION COUNT DATA

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Figure 4 (cont.)

Table 3. Peak Hour Volumes and Corresponding Time of Day

Map Code*	Intersection	AM	PM
M-1	VA 83 @ VA 72 (Georges Fork)	517 (8:00-9:00)	768 (3:00-4:00)
M-2	VA 83 @ T-607 (Clintwood)	1,012 (9:45-10:45)	1,272 (4:30-5:30)
M-3	VA 83 @ VA 80 South (Haysi)	385 (8:00-9:00)	519 (3:30-4:30)
M-4	VA 83 @ VA 80 North (Haysi)	233 (10:00-11:00)	368 (3:30-4:30)
M-5	US 460 @ VA 83 @ VA 83/US 460 (Grundy)	1,001 (8:00-9:00)	1,280 (4:30-5:30)
V-1	VA 83 @ US 23 Business (Pound)	708 (7:30-8:30)	938 (4:15-5:15)
V-2	VA 83 @ SR 631 (Clintwood)	1,015 (7:45-8:45)	1,164 (5:00-6:00)
V-3	VA 83 @ VA 63 (Fremont)	393 (7:45-8:45)	429 (2:45-3:45)
V-4	VA 83/80 @ VA 63 (Haysi)	494 (11:30-12:30)	634 (2:15-3:15)
V-5	VA 83 @ US 460 (Vansant)	1,324 (11:15-12:15)	1,801 (4:30-5:30)
V-6	VA 460 @ VA 83 Business (Grundy)	909 (11:30-12:30)	943 (3:30-4:30)
V-7	VA 83 @ SR 643 (Stacy)	308 (8:00-9:00)	294 (3:15-4:15)
V-8**	VA 80 @ Entrance to Breaks Interstate Park	150 (10:30-11:30)	218 (5:45-6:45)
V-9**	VA 80 @ SR 609	112 (11:15-12:15)	163 (12:15-1:15)
V-10**	US 460 @ SR 609	632 (11:15-12:15)	730 (3:00-4:00)

* See Figure 2.
** Values listed represent weekend (Friday, Saturday, or Sunday) peak hour volumes.

1.2.2 Vehicle Classification Data

A second objective of the video surveillance counts was to allow a classification of vehicles into auto, medium truck, and heavy truck categories. Medium trucks have only two axles and are largely represented by local delivery trucks. Large trucks have two or more axles and include all dump trucks and semi tractor-trailers. School buses are classified as large trucks due to their operational capabilities. Figure 5 shows the percentage of trucks on various segments of VA 83. The values listed represent the total number of trucks (medium plus heavy) as a percentage of the total traffic volume in both directions. A summary of the actual numbers of trucks observed at each location can be found in Appendix D.

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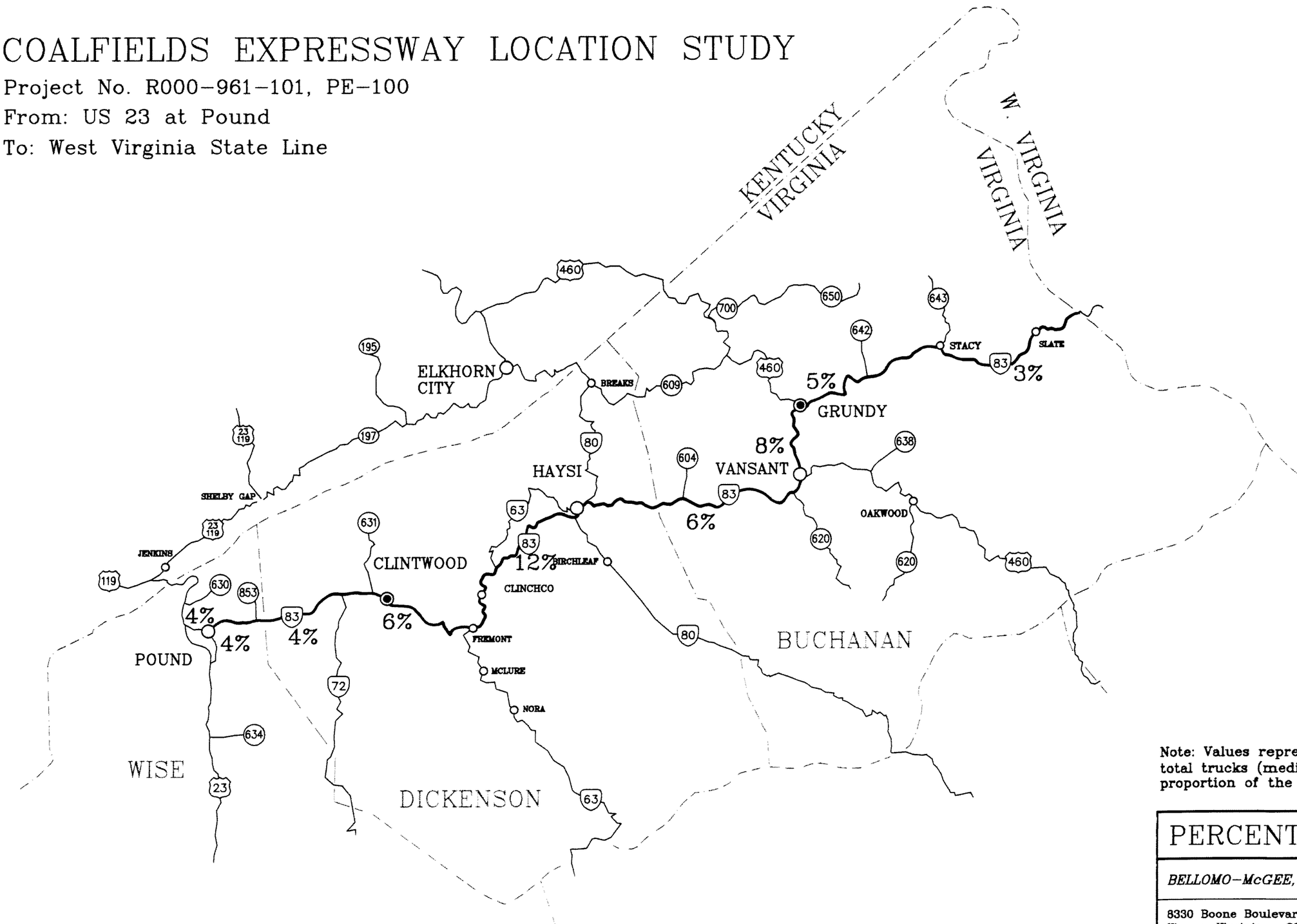

Note: Values represent the percentage of the total trucks (medium and heavy) as a proportion of the average weekday traffic.

PERCENT TRUCKS

BELLOMO-McGEE, INC. BMI

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Figure 5

Approx. Scale: 1" = 4.5 miles

1.2.3 Travel Time/Speed Data

Travel time runs were made along 13 separate segments of VA 83 and 21 sections of adjacent and parallel roadways. A map showing the travel time segments can be found in Appendix E. A stopwatch was used to measure the time required to traverse the segment at the prevailing or allowable speed. The length of each segment was measured using an odometer. Several times were measured along each segment at morning, midday and evening hours. The individual travel times recorded for each segment can be found in Appendix E. The measured segment distances were divided by the travel times to determine the average speed. The travel times and average speeds between major locations within the study area are presented in Table 4. Comparisons of the travel times of parallel routes in Kentucky are shown in the bottom half of Table 4. For example, the travel time from Pound to Breaks is nearly the same (56.1 minutes vs. 54.9 minutes) regardless of the route taken. The average speeds along VA 83 are shown in Figure 6. The results of the travel time runs indicate that speeds are neither direction dependent, nor time dependent (i.e., slower at some hours than others). Since the majority of the segments were two-lane facilities without passing opportunities, the resulting travel time was primarily influenced by large trucks or school buses encountered during the travel time run. The result was a queue of autos whose speed was limited by the truck or bus at the front.

Table 4. Travel Times and Average Speeds

Route 83 From	To	Distance (miles)	Travel Time (minutes)	Average Speed (minutes)
Pound	Clintwood	8.7	12.1	43.1
Clintwood	Haysi (80/83)	18.9	29.0	39.1
Haysi	Grundy	17.6	31.2	33.8
Grundy	W. Virginia State Line	15.4	25.8	35.8
Pound	**W. Virginia State Line**	**60.6**	**98.1**	**37.3***

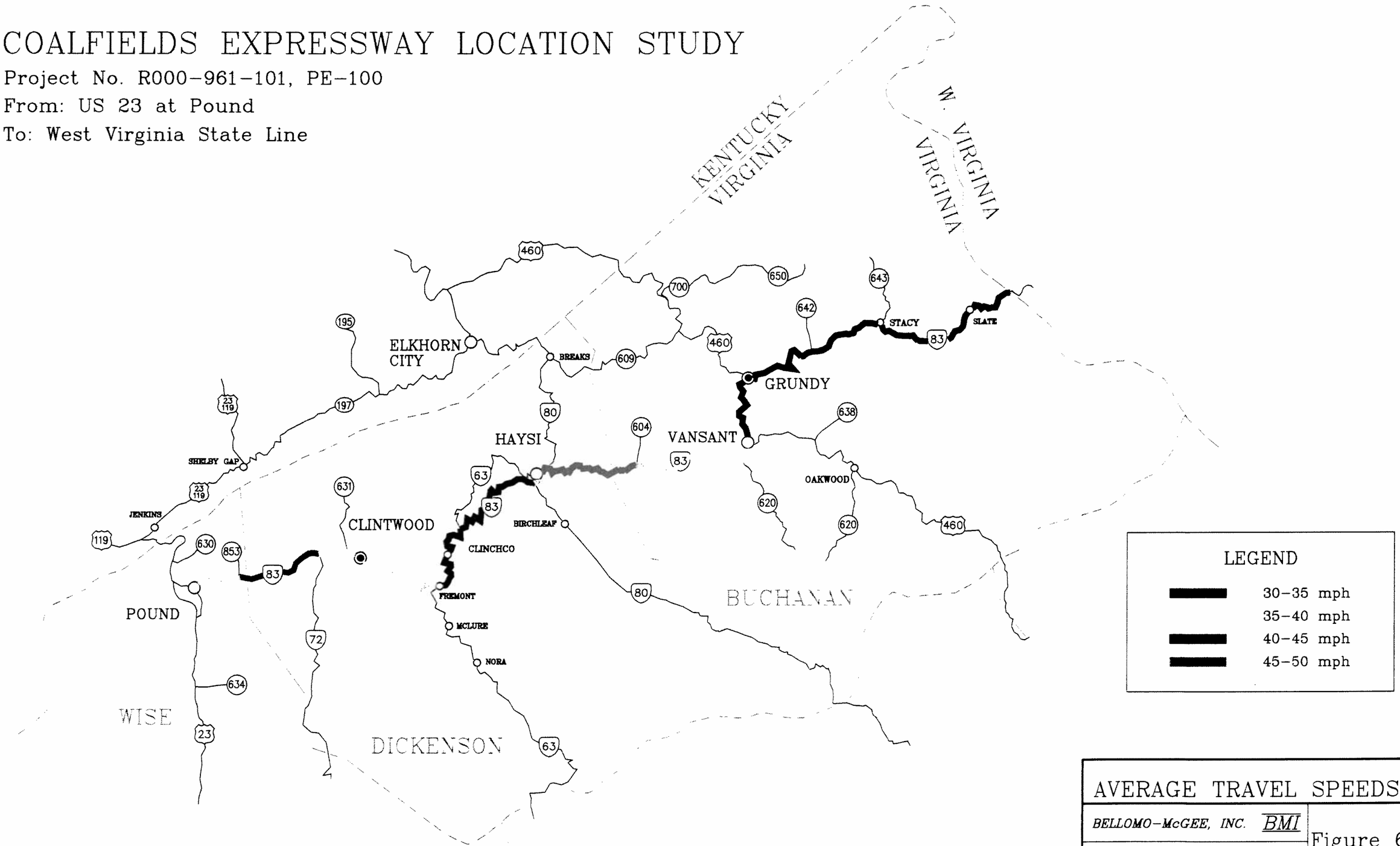
Alternate Route Comparisons

From	To	Distance (miles)	Travel Time (minutes)	Average Speed (mph)
Pound	Elkhorn City (via Routes 23/197)	27.3	46.9	35.8*
Pound	Elhorn City (via Routes 83/80)	41.1	64.1	39.1*
Pound	Breaks (via Routes 23/197/80)	32.8	56.1	35.8*
Pound	Breaks (via Routes 83/80)	35.6	54.9	39.6*
Pound	Grundy (via Routes 23/197/80/609/460)	53.8	83.5	39.7*
Pound	Grundy (via Route 83)	45.2	72.3	38.3*

* Average speed weighted by distance.

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



AVERAGE TRAVEL SPEEDS

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Figure 6

Approx. Scale:
1" = 4.5 miles

1.2.4 License Plate Survey Data

A license plate survey was conducted to identify trip-making patterns along the VA 83 corridor. More specifically, this survey was undertaken to quantify through vs. local trips. The license plate survey data was first assembled in a database using dBASE. The database was then converted to a spreadsheet format for further analyses. The license plates read only once, at only one of the survey stations, during the 8-hour period were first sorted out. Then, the data were arranged by license plate and the plates recorded at multiple stations were matched based on the time interval during which they were read. Our estimates of travel times from field test-runs were used as a basis to link the plates at sequential survey stations, defining a trip along the direction of survey, i.e., from east side of the corridor towards the west. If the travel time for a vehicle recorded at two neighboring stations indicated that the vehicle stopped for more than 15 minutes between those stations then the trip was not linked, i.e., two separate trips were considered. Finally, an origin-destination (O-D) trip matrix was created for all recorded trips and is presented in Table 5. This table represents trips between various survey stations only in one direction. The originating station indicates where the vehicle was recorded first and the destination station indicates where the trip terminated, i.e., was recorded last.

Table 5. Origin-Destination Trip-Matrix from License Plate Survey

Origin* (From Survey Station No.)	Destination (To Survey Station No.)								
	1	2	3	4	5	6	7	8	Total
1	633	n/a**	n/a	n/a	n/a	n/a	n/a	n/a	633
2	n/a	1479	n/a	n/a	n/a	n/a	n/a	n/a	1479
3	106	576	493	n/a	n/a	n/a	n/a	n/a	1175
4	16	102	52	667	n/a	n/a	n/a	n/a	837
5	2	11	1	19	394	n/a	n/a	n/a	427
6	0	0	0	4	59	1765	n/a	n/a	1828
7	0	2	1	9	36	n/a	1127	n/a	1175
8	2	10	3	11	150	n/a	n/a	3113	3289
Total	759	2180	550	710	639	1765	1127	3113	10843

* See Figure 2 for survey station locations.
** N/A indicates that survey was not performed for that O-D pair

Some key findings from the license plate survey are listed below.

- There is a minimal amount of traffic that traverses the study area from the eastern end to the western end. Less than 0.30% (18 out of 6292 trips) of the total traffic entering the study area from the east (i.e., from SB US 460 just north of Grundy, NB US 460 just south of Vansant, and WB Route 83 just east of Grundy) was found to reach Pound. Only about 4% (287 trips) of the total entering traffic was recorded traveling on WB Route 83 towards Haysi, possibly going up to Route 63.

- Approximately 5% (176 out of 3289 trips) of the traffic on NB US 460 just south of Vansant was found to be headed westbound on Route 83 towards Haysi or beyond.

- Approximately 3% (63 out of 1828 trips) of the traffic on SB US 460 just north of Grundy was recorded to be traveling westbound on Route 83 towards Haysi or beyond.

- Approximately 4% (48 out of 1175 trips) of the traffic on WB Route 83 recorded just east of Grundy was recorded to continue on WB Route 83 beyond Vansant towards Haysi or beyond.

- Approximately 10% (75 out of 714) of the traffic recorded on WB Route 83 east of Haysi continued on Route 83 beyond Route 63.

- Approximately 92% (394 out of 427) of the traffic originating around Vansant area does not go beyond Route 63.

- Out of 1175 trips recorded as originating around Clintwood area, about 49% (576 trips) were recorded on SB US 23, about 9% (106 trips) were found to be northbound on US 23, while about 42% (493 trips) were estimated to terminate in Pound.

- Approximately 70% (1479 out of 2112) of the traffic originating in the Pound area was found to be headed south towards SB US 23 whereas only about 30% headed north of Pound.

- An overwhelming 89% (9671 out of 10843 trips) of all the vehicles recorded were observed at only one station of the study area.

Based on our analyses, it appears that a majority of the trips on US 460 are through trips, i.e., they do not go on WB Route 83 towards Haysi. Also, few trips on WB 83 from the east side of Grundy continue towards Haysi or beyond. A significant portion of the traffic originating in the Pound or Clintwood area appears to be traveling southbound towards the Town of Wise or beyond on SB US 23. More traffic activity occurs near the east and west ends of the study area than in the middle and through the corridor.

1.2.5 Journey to Work Data

To further examine existing traffic patterns in the study area, BMI accessed the 1990 U.S. Census Transportation Planning Package (CTPP) and obtained "Journey to Work" information. These data are based on a person's listed residence and location of employment at the time of the Census. The CTTP Journey to Work data for the Coalfields Expressway Corridor is described in Table 6. Figure 7 illustrates the commuting patterns between and within Wise, Dickenson, and Buchanan Counties. The values shown in Table 6 and Figure 7 are the number of people who live in one area (i.e., the origin) and had their place of work in another area (i.e., the destination) during the week the Census was taken. For example, Table 6 shows that 8,540 people stated that they both live and work in Wise County. Similarly, 173 people said they lived in Dickenson County and worked in the City of Norton. Only a small number of commuters (about 120) cross the entire study corridor. It is important to note that these numbers represent person-trips. The

corresponding number of vehicle-trips is less than this number due to ride sharing and car pools. This also excludes those who were on vacation or did not complete a Census form. The "Other" category represents those people either living or working outside the listed areas at the time of the Census.

Table 6. Summary of Journey to Work Trips from Census Data

Destinations (Place of Work)	Origins (Place of Residence)							
	Wise County	Dickenson County	Buchanan County	City of Norton	West Virginia	Kentucky	VA* NC TN	Other
Wise County	**8540**	692	30	575	26	310	**2464**	415
Dickenson County	288	**3025**	197	16	55	16	408	0
Buchanan County	42	447	**7884**	0	575	323	**2478**	7
City of Norton	**2961**	173	0	821	18	136	x	x
W. Virginia	9	27	227	0	x	x	x	x
Kentucky	265	109	342	11	x	x	x	x
VA,NC,TN *	983	394	786	x	x	x	x	x
Other	57	13	19	x	x	x	x	x

* VA (Virginia), NC (North Carolina), TN (Tennessee)

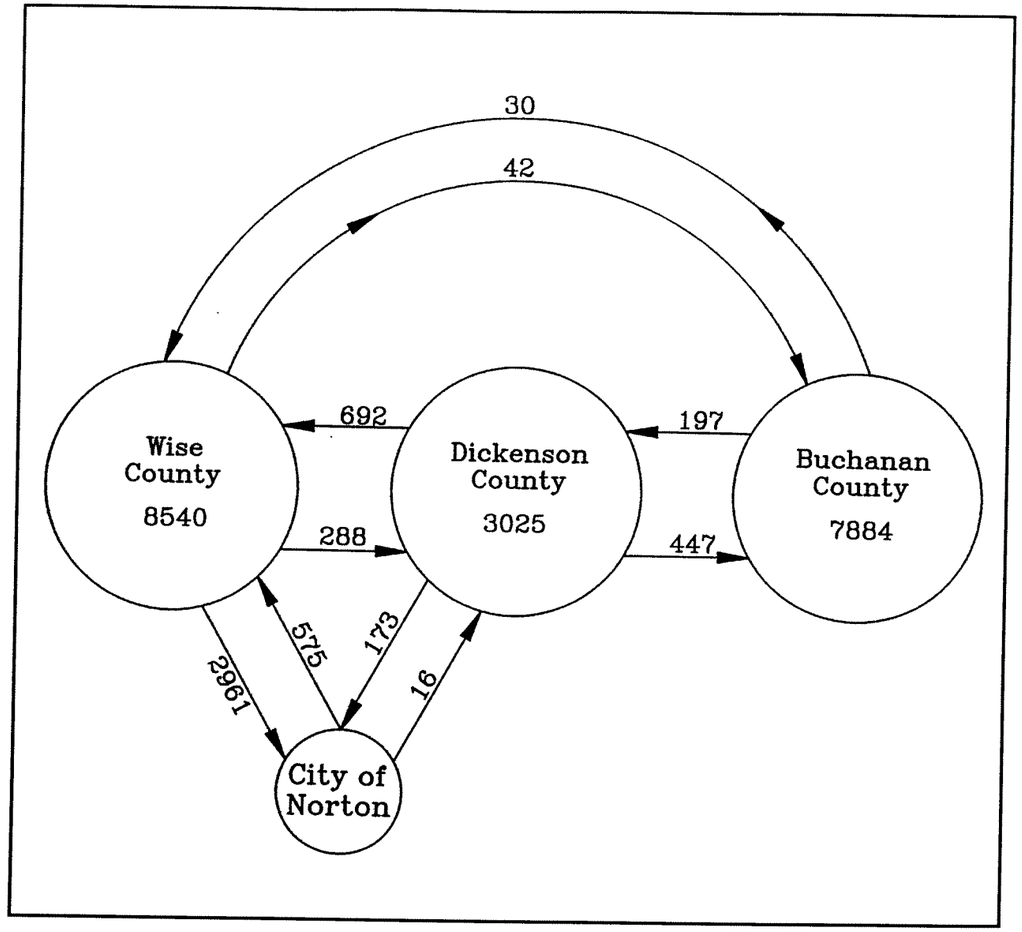


Figure 7. Census Journey to Work Data

1.3 Traffic Operations Analysis

A Level of Service (LOS) analysis was completed using the Highway Capacity Manual Software Release 2.1d for 10 sections of roadway within the corridor, as well as 15 intersections. Five of the fifteen intersections were signalized, with the others under stop control. Figure 8 shows the calculated LOS based on the traffic counts made at each of the 25 locations. For the 10 roadway sections, Table 7 lists the location of the count, the peak hour of traffic, and the resulting LOS during the peak hour. The analysis suggests that the worst traffic congestion in the corridor is within the immediate vicinity of Grundy, where a LOS of "E" was calculated at three locations. All other sections of VA 83 are operating at a LOS of "C" or better. Table 8 gives the location of the intersection counts, the AM and PM peak hours, and the corresponding LOS for each peak. The results do not suggest that any intersection operates at a LOS "C" or worse during the morning or evening peak periods. Appendix F contains the LOS worksheets for each location.

Table 7. Segment Peak Hour and Level of Service

Location	Peak Hour	LOS
US 23 Business - North	4:15-5:15 PM	B
US 23 Business - South	3:00-4:00 PM	D
VA 83 @ Wise/Dickenson Co. Line	4:30-5:30 PM	C
VA 83/63 between SR 779 and SR 664	3:45-4:45 PM	C
VA 83 @ Prater	4:30-5:30 PM	C
VA 83/US 460 between Vansant and Grundy	4:30-5:30 PM	E
VA 83 between SR 642 and SR 674	3:15-4:15 PM	C
US 460 between Vansant and Oakwood	4:15-5:15 PM	A
VA 83 East of Grundy	4:30-5:30 PM	E
US 460 West of Grundy	3:30-4:30 PM	E

Table 8. Intersection Peak Hour and Level of Service

Location	AM LOS	Peak Hour	PM LOS	Peak Hour
VA 83 @ US 23 Business (Pound)	A	7:30-8:30 AM	A	4:15-5:15 PM
VA 83 @ SR 631 (Clintwood)	B	7:45-8:45 AM	B	5:00-6:00 PM
VA 83 @ VA 63 (Fremont)	A	7:45-8:45 AM	A	2:45-3:45 PM
VA 83/80 @ VA 63 (Haysi)	A	10:30-11:30 AM	A	2:15-3:15 PM
VA 83 @ US 460 (Vansant)	A	11:15-12:15 PM	B	4:30-5:30 PM
VA 460 @ VA 83 Business (Grundy)	B	11:30-12:30 PM	B	3:30-4:30 PM
VA 83 @ SR 643 (Stacy)	A	8:00-9:00 AM	A	3:15-4:15 PM
VA 80 @ Entrance to Breaks Interstate Park	A	10:30-11:30 AM	A	5:45-6:45 PM
VA 80 @ SR 609	A	11:30-12:30 PM	A	5:45-6:45 PM
US 460 @ SR 609	A	11:30-12:30 PM	A	3:15-4:15 PM
VA 83 @ VA 72 (Georges Fork)	A	8:00-9:00 AM	A	3:00-4:00 PM
VA 83 @ T-607 (Clintwood)	B	9:45-10:45 AM	B	4:30-5:30 PM
VA 83 @ VA 80 South (Haysi)	A	8:00-9:00 AM	A	3:30-4:30 PM
VA 83 @ VA 80 North (Haysi)	A	10:00-11:00 AM	A	3:30-4:30 PM
US 460 @ VA 83 (Grundy)	B	8:00-9:00 AM	B	4:30-5:30 PM

1.4 Traffic Safety Analysis

An analysis of State statistical accident data for the VA 83 corridor was undertaken to identify areas with above average accident rates. The accident data covered a three-year period from April 1, 1994 to March 31, 1997. Overall, the corridor-wide accident rate was 153 accidents per 100 million vehicle miles, which is slightly above the state average. Injury and fatality rates were also slightly above state averages.

An accident rate of 250 per 100 million vehicle miles was selected to screen the potential high accident sections. This criterium was set at about 165% of the corridor average to identify sections where the number of reported accidents was likely not due to transient statistical variation. Sections used in the analysis were normally targeted at one mile lengths, unless there was some change in highway geometry or traffic volume that suggested a different length.

Eleven sections of the Route 83 corridor meeting the high accident rate criterium are identified on Figure 9. These sections comprise approximately 16% of the total length of VA 83. As

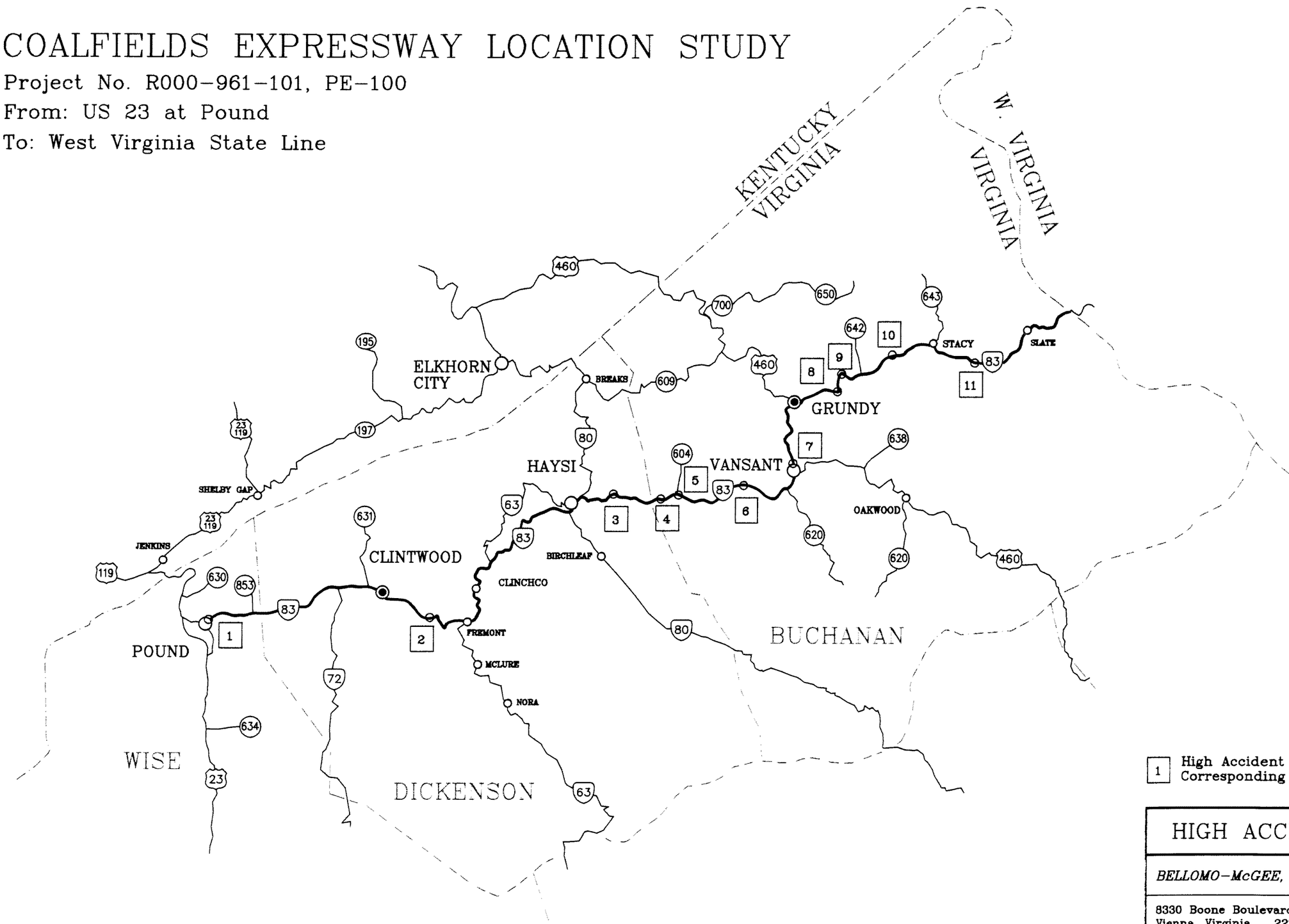
Figure 9 shows, the high accident sections are concentrated in the eastern half of the corridor, with eight of the eleven sections in Buchanan County. There was one accident fatality during this 3-year period, which did not occur within any of the high accident sections.

Table 9 describes the accident characteristics at each of the high accident sections shown in Figure 9. Most of the sections (except #1 and #7) have a much higher proportion of off-road or other loss of control incidents than normal. Section 1 (east of Bus. 23 in Pound) has a typical intersection - urban area pattern. Section 7 has a very high proportion of rear end incidents, most of which are not associated with any intersection. Section 9 also has a high proportion of rear end collisions.

Trucks are only a minor element in the accident reports. Only 13 of the 174 collisions reported in the high accident sections involved trucks or other heavy vehicles. This proportion (7%) compares favorably with the vehicle mix in the corridor, which ranges from 6% to 12% heavy vehicles. From this result, it appears that heavy vehicle traffic is not disproportionately contributing to the accident rates.

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



1 High Accident Sections Corresponding to Table 9

HIGH ACCIDENT SECTIONS

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Figure 9

Approx. Scale: 1" = 4.5 miles

Table 9. Route 83 High Accident Sections

Section	Location	Number of Accidents	Accident Rate[1]	Injury Acc. (Persons injured)	Number of trucks	Rear-end	Angle	Off-road	Sideswipe & Head-on	All Other
1	From Bus. 23 east 0.65 mi	19	476	6 (13)	2	4	8	4	1	2
2	From SR649 1.05 mi east	15	334	9 (12)	1	1	1	8	2	3
3	From .5 mi west of SR680 to 0.2 mi east of SR680	7	326	1 (1)	1	0	1	4	2	0
4	From .65 mi west of SR656 to .25 mi east of SR656	7	252	3 (3)	1	2	0	4	0	1
5	From .05 mi west of SR604 to .05 mi west of SR707	11	393	5 (13)	0	0	4	5	1	1
6	From 0.15 mi west of SR718 to .6 mi east of SR718	11	335	6 (7)	4[2]	1	0	4	4	2
7	From US460/SR83 north 1.0 mi	41	267	21 (43)	3	24	8	1	2	6
8	From .15 mi west of SR586 east 1.0 mi	16	313	9 (12)	1	5	1	8	2	0
9	From .6 mi west of SR728 to .25 mi east of SR728	17	392	11 (17)	1	8	1	3	3	2
10	From .4 mi west of SR674 to .1 mi west of SR716	16	359	8 (12)	0	1	2	12	1	0
11	From 0.2 west of SR640 to .95 mi east of SR640	14	264	7 (10)	0	0	5	5	1	3
Totals		174	—	86 (143)	14	46	31	58	19	20

Notes: [1]Accidents per 100 million vehicle miles.
[2]4 trucks involved in 3 collisions.

2. 2020 NO BUILD TRAFFIC CONDITIONS

2.1 Land Use

For the purpose of projecting 2020 traffic volumes throughout the study area corridor, it was necessary to create a zone system, for which forecasts of household growth and employment levels were developed by HSMM. These zone-level land use forecasts were then used to generate estimates of future traffic that take into account the relative growth, or decline, of specific areas within the corridor. The use of this level of detail was also important in the development of traffic projections for each of the Build alternatives that were evaluated.

Figure 10 shows the study area zone system that was developed. Tables 10 and 11 contain the corresponding numbers of existing and 2020 households and employment (e.g., jobs) in each of the zones. Employment is disaggregated into non-retail, retail and mining categories. A total of 39 zones were delineated for this project.

Summary points concerning the 2020 No Build scenario land use forecasts include the following:

- Households are expected to increase by approximately 19% throughout the study area.
- Retail jobs are projected to increase by 10%, although non-retail jobs are projected to decline by 9%.
- Mining employments levels are expected to hold at existing levels into the future.
- Overall, a 3% decline in employment levels is forecast.

2.2 Traffic Projections

A factoring approach was applied to project 2020 traffic volumes. Separate growth factors were derived for internal, internal-external and external-external (e.g., through trips) traffic on a daily basis. Peak hour traffic volumes were then developed by factoring the projected daily volumes. These peak hour conversion factors were derived from existing daily and peak hour count characteristics.

The factoring approach used to project 2020 daily traffic volumes made use of the QRS II modeling software, although the model was not applied in the traditional sense. Since the QRS II model is relatively simple and quick to apply, it was used in lieu of the spreadsheet-based procedure that was initially envisioned

The highway network used in the model contains all of the primary State highways (VA 83, US 460, etc) and those secondary highways that could be affected by the alternatives, or that connected the traffic analysis zones. The QRS II model was not validated per se, since the applied factoring approach did not require the level of accuracy that validation brings. Despite this, the model simulated existing traffic volumes fairly well after minor adjustments.

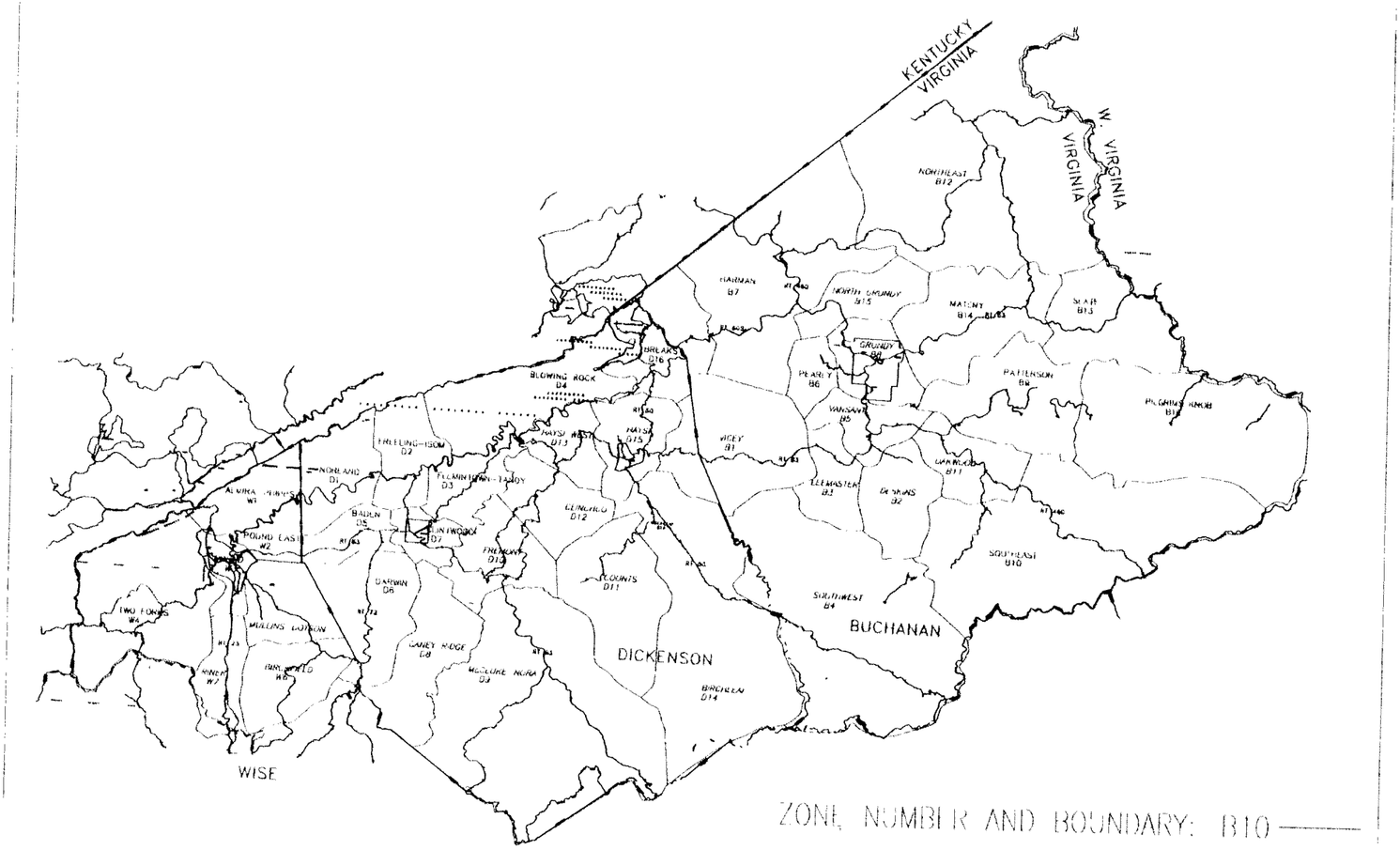

Figure 10. Study Area Zone System

Table 10. Existing Land Use

Zone #	Zone Name	Households	Non-Retail Jobs	Retail Jobs	Mining Jobs	Total Jobs
B01	Vicey	415	206	58	114	378
B02	Deskins	410	224	35	113	372
B03	Leemaster	1310	555	192	262	1009
B04	Southwest	705	299	104	141	544
B05	Vansant	713	355	100	175	630
B06	Pearly	531	264	75	145	484
B07	Harman	1564	634	107	425	1166
B08	Grundy	895	391	146	198	735
B09	Paterson	1332	736	230	221	1187
B10	Southeast	779	426	65	214	705
B11	Oakwood	860	472	72	236	780
B12	Northeast	224	98	37	50	185
B13	Slate	199	87	32	44	163
B14	Mateney	497	217	81	110	408
B15	North Grundy	670	293	110	148	551
B16	Pilgrim's Knob	750	313	56	210	579
D01	Norland	321	113	41	24	178
D02	Freeling - Isom	148	52	19	11	82
D03	Flemingtown - Tandy	247	87	31	18	136
D04	Blowing Rock	309	109	39	23	171
D05	Baden	210	75	26	15	116
D06	Darwin	844	334	108	51	493
D07	Clintwood	723	286	93	44	423
D08	Caney Ridge	603	239	78	37	354
D09	McClure - Nora	727	280	63	65	408
D10	Fremont	240	96	31	15	142
D11	Counts	397	153	34	36	223
D12	Clinchco	481	139	97	36	272
D13	Haysi West	444	128	89	34	251
D14	Birchleaf	198	76	17	18	111
D15	Haysi	647	187	130	49	366
D16	Breaks	277	80	56	21	157
W01	Almira - Phipps	224	119	44	29	192
W02	Pound East	247	131	49	32	212
W03	Pound	337	178	66	43	287
W04	Two Forks	636	367	136	89	592
W05	Mullins - Dotson	314	167	62	40	269
W06	Birchfield	331	186	69	45	300
W07	Riner	159	92	34	22	148
	Totals	**20,918**	**9,244**	**2,912**	**3,603**	**15,759**

Table 11. 2020 No Build Land Use

Zone #	Zone Name	Households	Non-Retail Jobs	Retail Jobs	Mining Jobs	Total Jobs
B01	Vicey	491	181	64	114	359
B02	Deskins	485	201	39	113	353
B03	Leemaster	1551	687	211	262	1160
B04	Southwest	834	262	114	141	517
B05	Vansant	845	314	110	175	599
B06	Pearly	628	252	83	145	480
B07	Harman	1852	565	118	425	1108
B08	Grundy	1060	339	161	198	698
B09	Paterson	1577	654	253	221	1128
B10	Southeast	922	384	72	214	670
B11	Oakwood	1018	426	79	236	741
B12	Northeast	264	85	41	50	176
B13	Slate	235	76	35	44	155
B14	Mateney	588	189	89	110	388
B15	North Grundy	793	254	121	148	523
B16	Pilgrim's Knob	888	278	62	210	550
D01	Norland	387	100	45	24	169
D02	Freeling - Isom	178	46	21	11	78
D03	Flemingtown - Tandy	298	72	34	18	124
D04	Blowing Rock	372	96	43	23	162
D05	Baden	253	66	29	15	110
D06	Darwin	1017	298	119	51	468
D07	Clintwood	871	256	102	44	402
D08	Caney Ridge	727	213	86	37	336
D09	McClure - Nora	876	254	69	65	388
D10	Fremont	289	86	34	15	135
D11	Counts	478	139	37	36	212
D12	Clinchco	580	115	107	36	258
D13	Haysi West	535	106	98	34	238
D14	Birchleaf	239	68	19	18	105
D15	Haysi	780	156	143	49	348
D16	Breaks	334	66	62	21	149
W01	Almira - Phipps	269	105	48	29	182
W02	Pound East	296	115	54	32	201
W03	Pound	404	228	73	43	344
W04	Two Forks	763	323	150	89	562
W05	Mullins - Dotson	377	148	68	40	256
W06	Birchfield	397	164	76	45	285
W07	Riner	191	82	37	22	141
	Totals	**24,942**	**8,449**	**3,206**	**3,603**	**15,258**

Inside the Towns of Pound and Clintwood; however, there was enough intrazonal (local) traffic to increase the ADT counts well above the QRS II simulated count. This result was expected, since traffic analysis zones used in a regional model are quite large.

The QRS II model was then used to calculate the proportional increases in traffic between the existing land use and the 2020 No Build land use. These proportions were applied as factors to the existing traffic counts to determine the future ADT volumes. Since many of the Towns have large local traffic flows, two factors were calculated: an interzonal factor based on the increase in the modeled traffic, and an intrazonal factor based on the increase in intrazonal trips. Except in the Town of Pound, the two factors were nearly identical. In factoring the existing volumes, the portion of the traffic count that was not included in the QRS II model assignment was assumed to be local traffic, and was factored using the local intrazonal traffic growth factor.

The intersection forecasts were calculated based on the ADT growth on each intersection approach. All of the approaches at any given intersection in the No Build scenario had about the same factor. Where some of the approaches had divergent factors, a balancing procedure was required to produce the intersection turn movement projections.

Figures 11 and 12 show the 2020 No Build daily and peak hour traffic projections. Generally speaking, traffic is projected to increase by approximately 25% over existing levels under the No Build scenario.

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
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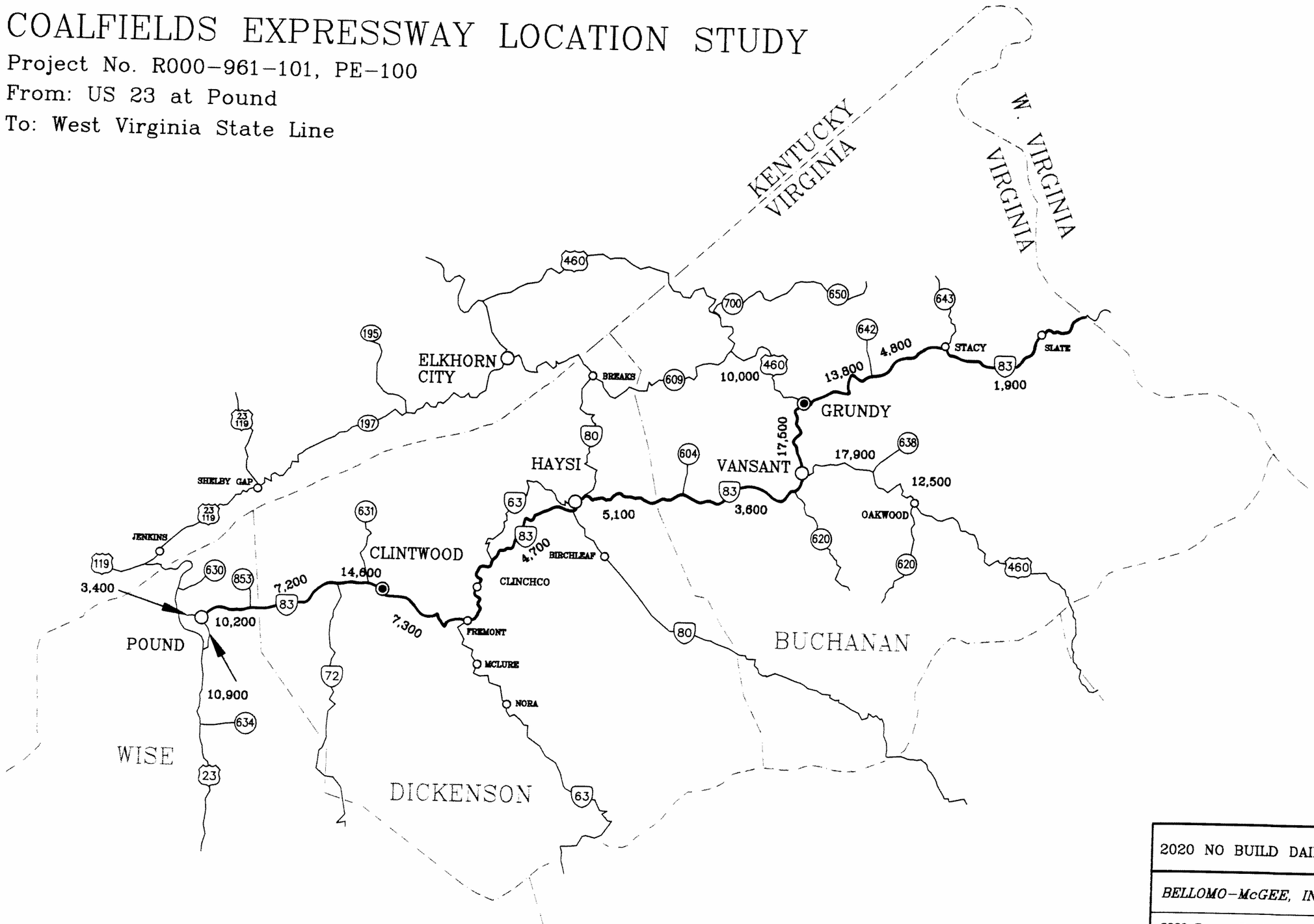
To: West Virginia State Line



2020 NO BUILD DAILY TRAFFIC PROJECTIONS

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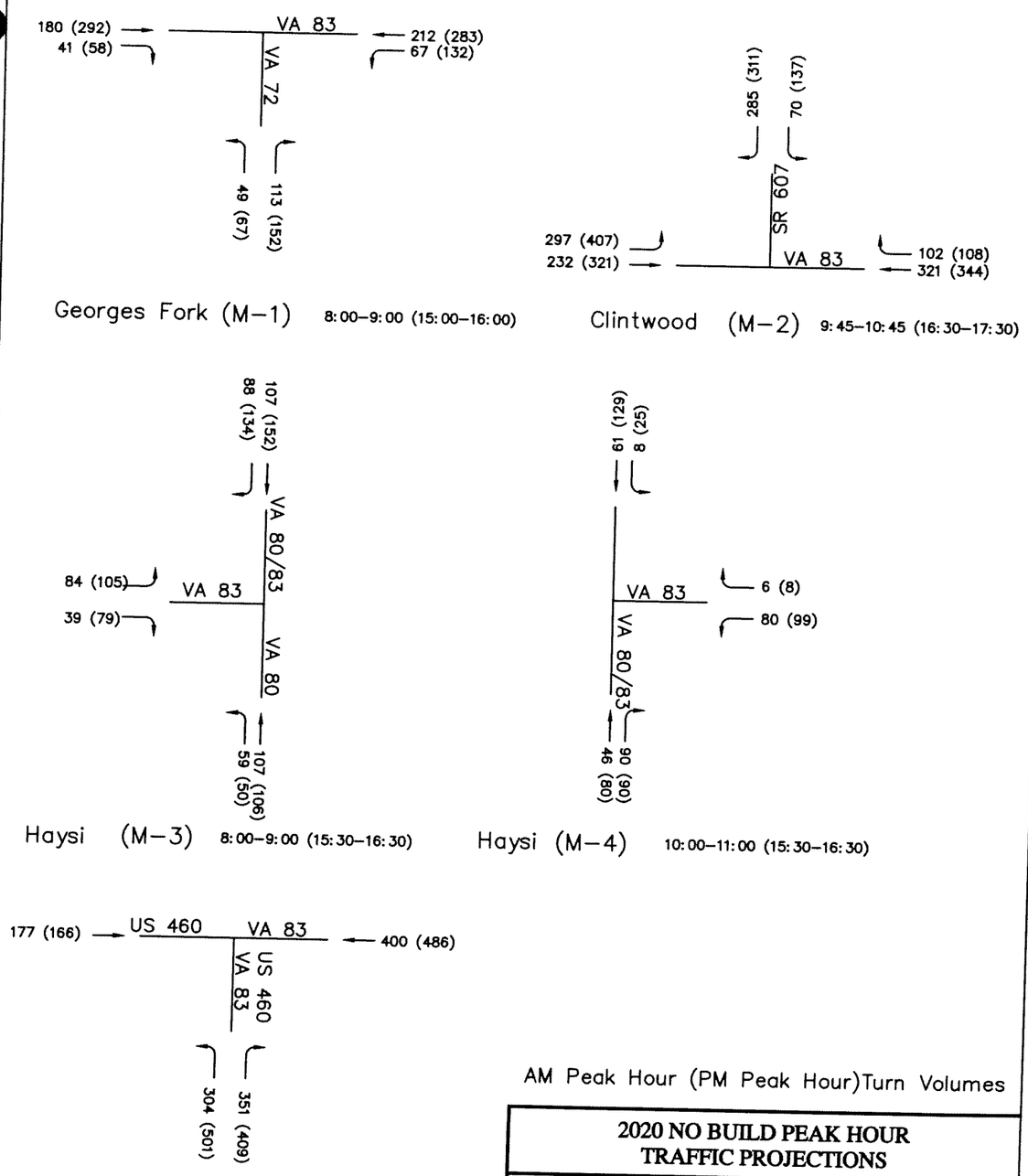
Figure 11

Approx. Scale: 1" = 4.5 miles



AM Peak Hour (PM Peak Hour)Turn Volumes

2020 NO BUILD PEAK HOUR TRAFFIC PROJECTIONS

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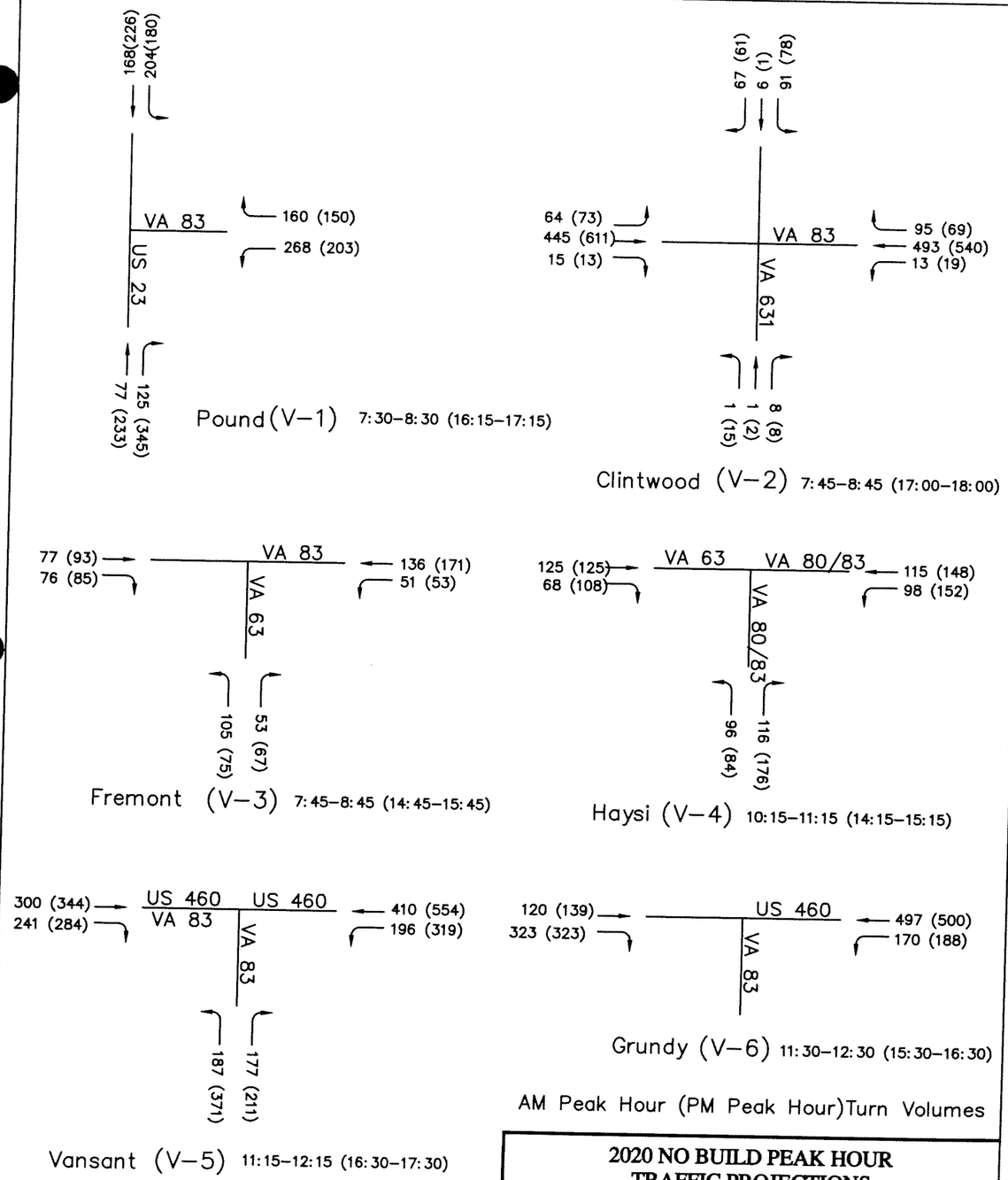
Figure 12



2020 NO BUILD PEAK HOUR TRAFFIC PROJECTIONS

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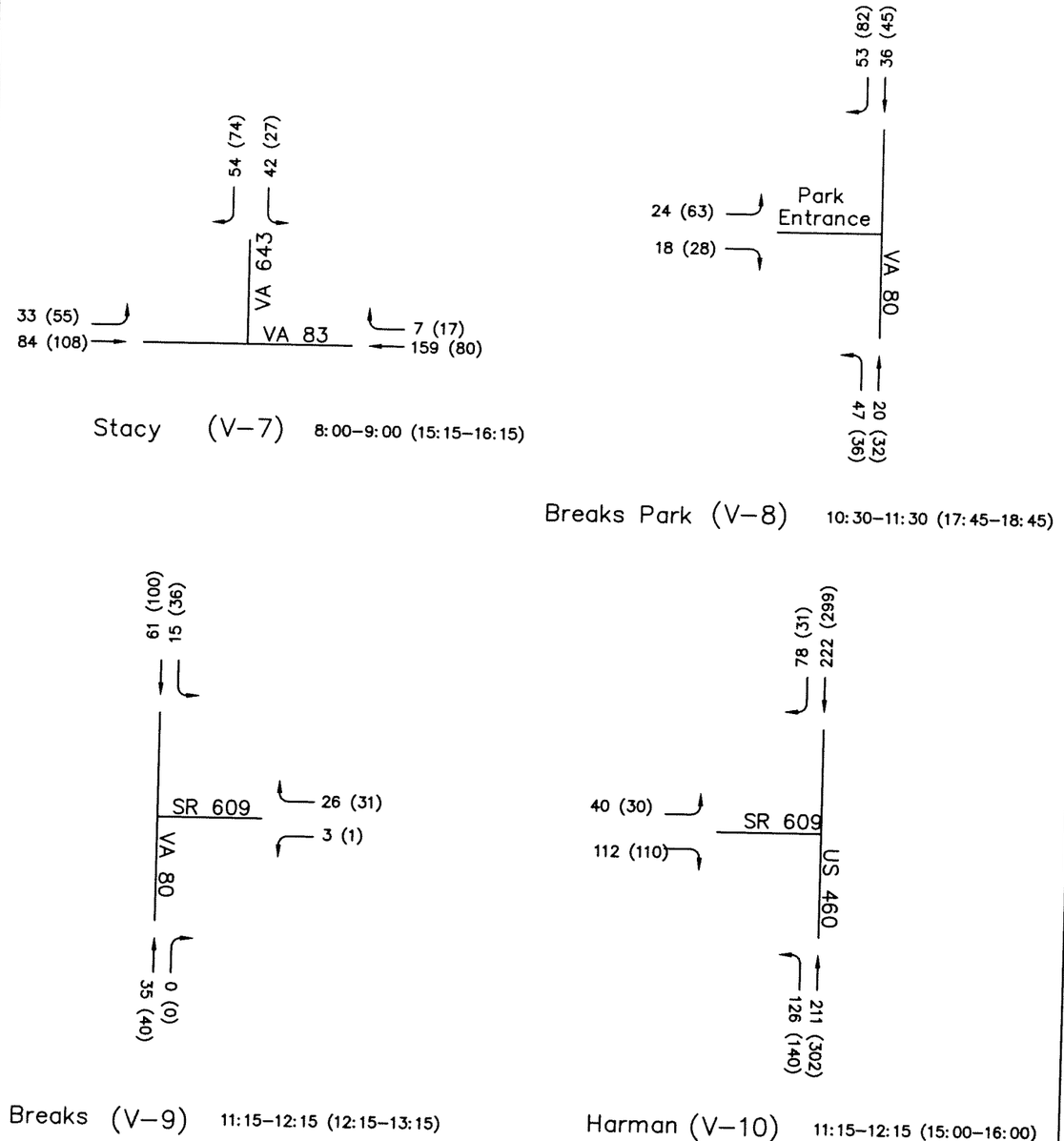
Figure 12 (cont.)



2020 NO BUILD PEAK HOUR TRAFFIC PROJECTIONS

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Figure 12 (cont.)

2.3 Traffic Operations Analysis

Using the 2020 No Build traffic projections, level of service analyses were performed using the Highway Capacity Manual software (HCS Release 2.1d). Ten (10) roadway sections along VA 83 and fifteen (15) key intersections were analyzed, which correspond to those locations that were analyzed for existing conditions. Although the No Build scenario, by definition, does not assume major changes or improvements to the roadway system, several minor improvements recommended in VDOT's 1997 "Route 83 Short Range Needs Assessment Report" were assumed:

1. Modification of the VA 83/US 23 Business intersection in Pound to include a new northbound right-turn lane and installation of a signal.

2. Provision of a eastbound right-turn lane on VA 83 at the VA 72 intersection between Pound and Clintwood.

3. Widening of VA 83 within Clintwood that results in upgrades to the VA 83/SR607 intersection.

Tables 12 and 13 compare the existing (1997) and 2020 No Build levels of service at the analysis locations. These results are also displayed in Figure 13.

Table 12. Segment Peak Hour Level of Service

Location	Existing LOS	2020 No Build LOS
US 23 Business - North	B	C
US 23 Business - South	D	E
VA 83 @ Wise/Dickenson Co. Line	C	D
VA 83/63 between SR 779 and SR 664 (Clinchco)	C	C
VA 83 @ Prater	C	C
VA 83/US 460 between Vansant and Grundy	E	E
VA 83 between SR 642 and SR 674 (West of Stacy)	C	D
US 460 between Vansant and Oakwood	A	A
VA 83 East of Grundy	E	E
US 460 West of Grundy	E	E

Table 13. Intersection Peak Hour Level of Service

Location	Existing LOS		2020 No Build LOS	
	AM	PM	AM	PM
VA 83 @ US 23 Business (Pound)	A	A	B	B
VA 83 @ SR 631 (Clintwood)	B	B	B	B
VA 83 @ VA 63 (Fremont)	A	A	A	A
VA 83/80 @ VA 63 (Haysi)	A	A	A	A
VA 83 @ US 460 (Vansant)	A	B	B	C
VA 460 @ VA 83 Business (Grundy)	B	B	B	B
VA 83 @ SR 643 (Stacy)	A	A	A	A
VA 80 @ Entrance to Breaks Interstate Park	A	A	A	A
VA 80 @ SR 609	A	A	A	A
US 460 @ SR 609	A	A	A	A
VA 83 @ VA 72 (Georges Fork)	A	A	A	A
VA 83 @ T-607 (Clintwood)	B	B	B	B
VA 83 @ VA 80 South (Haysi)	A	A	A	A
VA 83 @ VA 80 North (Haysi)	A	A	A	A
US 460 @ VA 83 (Grundy)	B	B	B	B

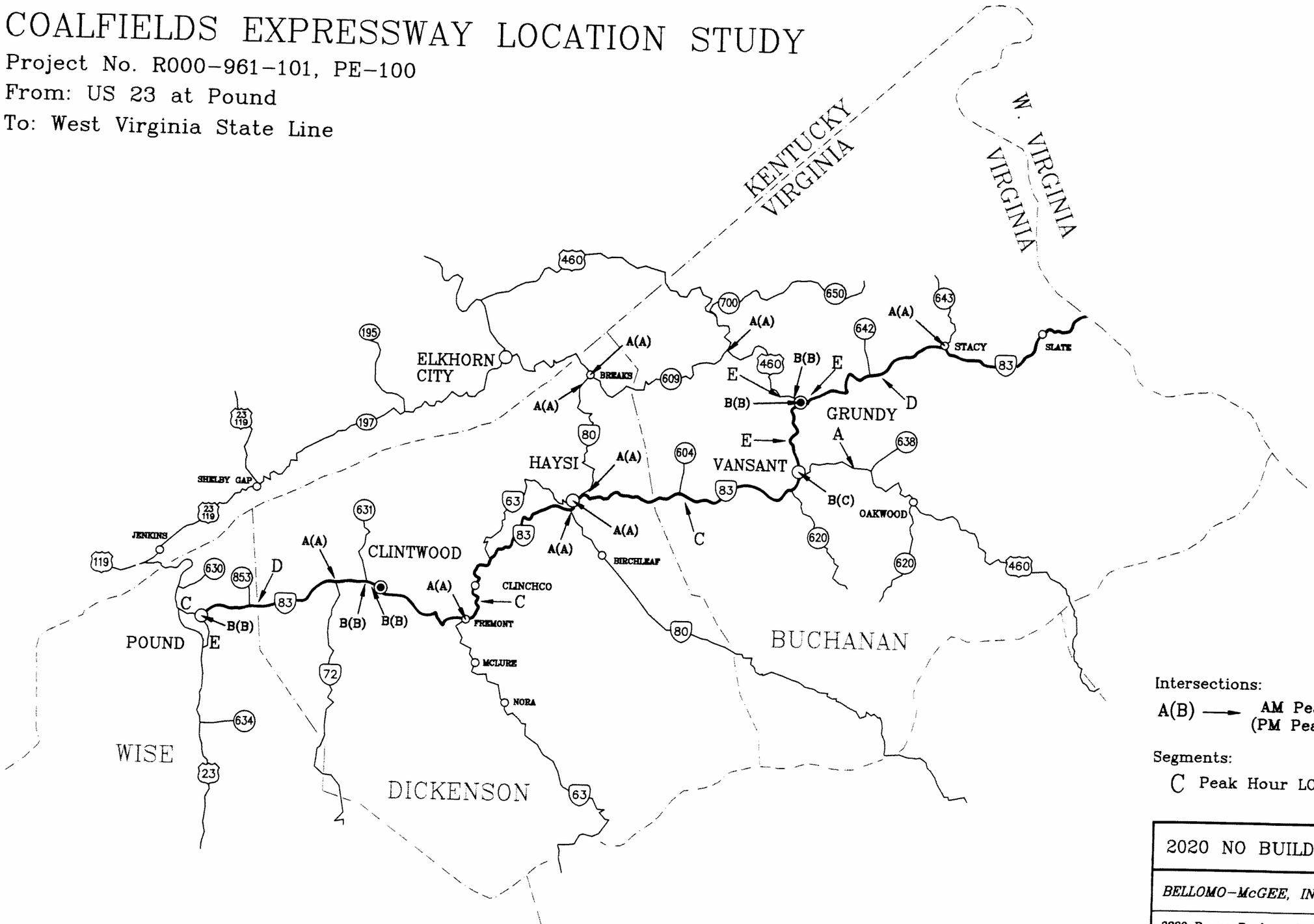
* correspond to locations shown in Figure 13.

Four of the ten VA 83 and US 460 segments are projected to be at LOS E, which represents an unacceptable level of service. Three of these segments are currently at LOS E. Several of the other segments degrade one LOS level.

All of the intersections analyzed are projected to operate at an acceptable level of service.

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



Intersections:

A(B) ⟶ AM Peak Hour LOS
(PM Peak Hour LOS)

Segments:

C Peak Hour LOS

2020 NO BUILD LEVEL OF SERVICE

BELLOMO-McGEE, INC. BMI

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Vienna, Virginia 22182
703 / 847-3071

Figure 13

Approx. Scale:
1" = 4.5 miles

3.0 2020 BUILD TRAFFIC CONDITIONS

3.1 Traffic Projections

Traffic projections for each of the five build alternative alignments were developed based on 2020 forecasts of households and employment in the study area, which were produced by HSMM. Table 14 presents a summary of the land use forecasts. Separate sets of forecasts were developed for the 2020 No Build and 2020 Build scenarios due to the anticipated economic growth expected should the Coalfields Expressway be constructed. As shown in Table 6, the number of study area households is projected to increase by 19% over existing conditions for the 2020 No Build and by 67% under 2020 Build conditions. Study area employment, on the other hand, is projected to decrease 3% under the 2020 No Build scenario, but increase by 60% under Build conditions.

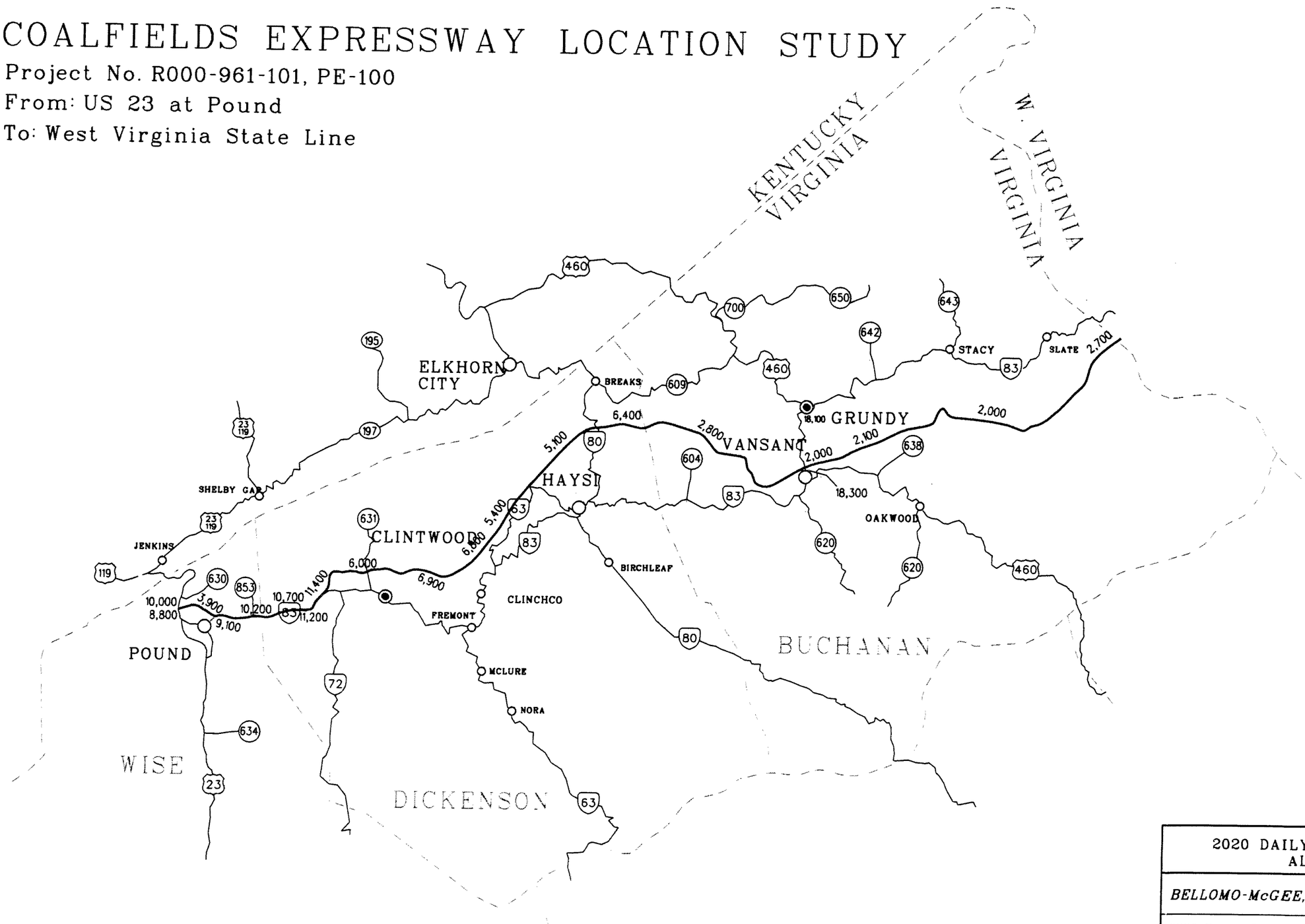
2020 average daily traffic projections for each of the five build alternative alignments are shown in Figures 14 through 18. 2020 average daily traffic projections for existing VA Route 83 and each of the five 2020 Build alternatives are summarized at the County lines in Table 15. At the Wise/Dickenson County line, traffic is projected to increase by 40 to 70% under the Build alternatives as compared to No Build conditions; whereas, at the Dickenson/Buchanan County line, traffic is projected to increase 60 to 140%.

Table 14. Projected Study Area Land Use

Year	Households	Employment			
		Non-Retail	Retail	Mining	Total
Existing	20,918	9,244	2,912	3,603	15,759
2020 No Build (% Change vs. Existing)	24,942 (+19%)	8,449 (-9%)	3,206 (+10%)	3,603 (0%)	15,258 (-3%)
2020 Build (% Change vs. No Build)	34,941 (+40%)	15,130 (+79%)	6,509 (+103%)	3,603 (0%)	25,242 (+65%)
% Change: Build vs. Existing	+67%	+64%	+124%	0%	+60%

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



2020 DAILY TRAFFIC PROJECTIONS
ALTERNATIVE A

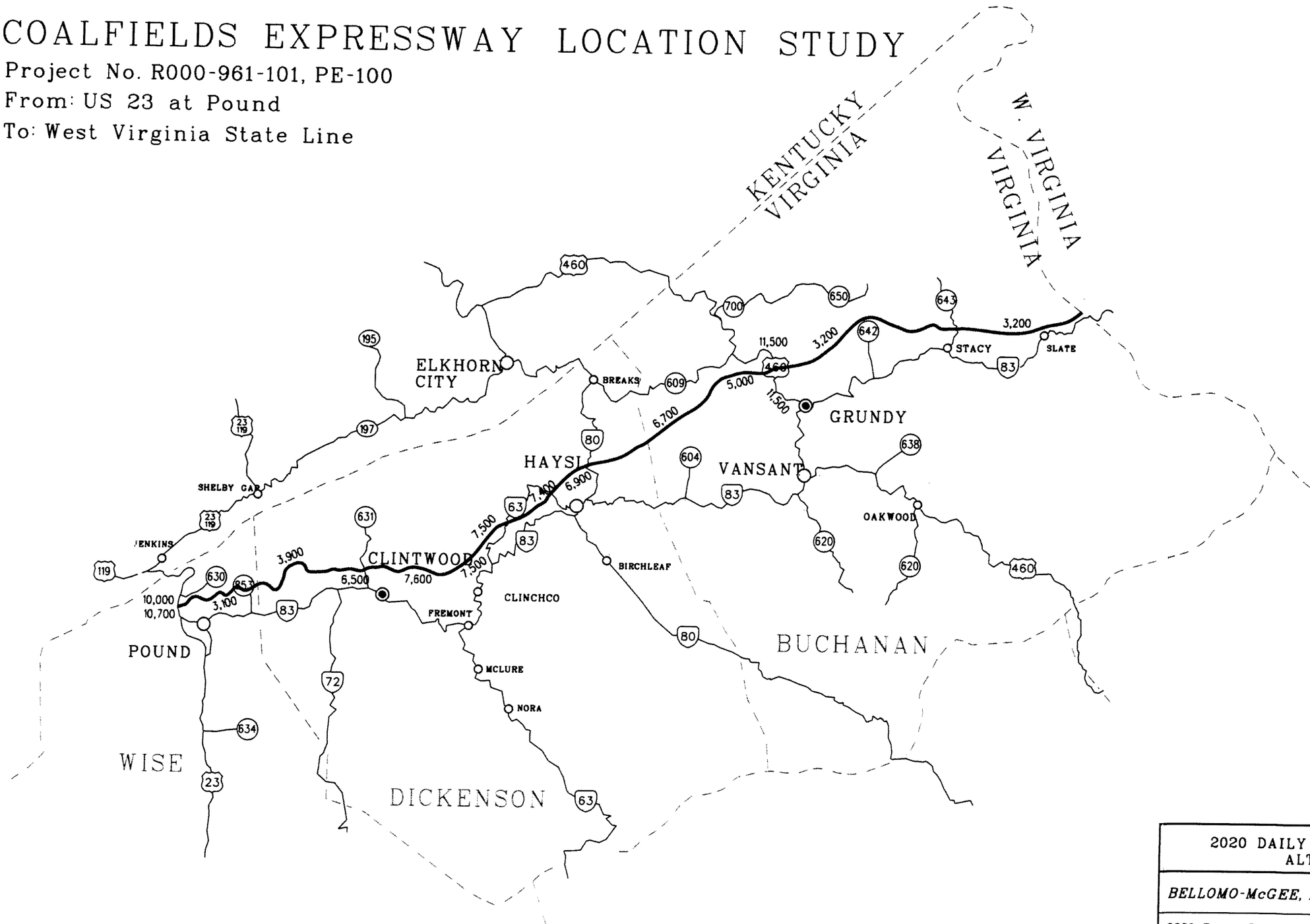
BELLOMO-McGEE, INC. BMI
8330 Boone Boulevard-Suite 700
Vienna, Virginia 22182
703 / 847-3071

Figure14

Approx. Scale:
1" = 4.5 miles

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



2020 DAILY TRAFFIC PROJECTIONS
ALTERNATIVE B

BELLOMO-McGEE, INC. BMI

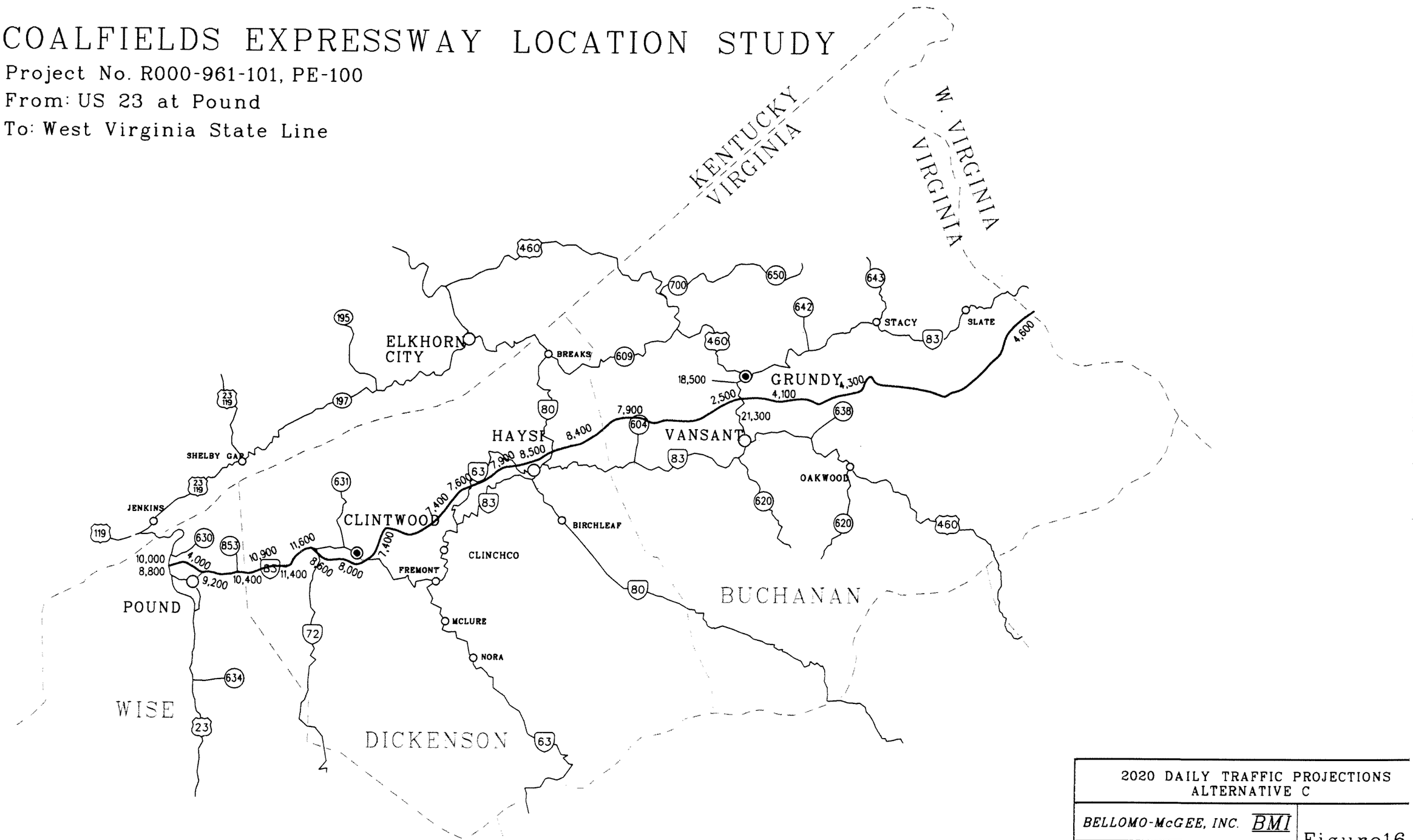
8330 Boone Boulevard-Suite 700
Vienna, Virginia 22182
703 / 847-3071

Figure15

Approx. Scale:
1" = 4.5 miles

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



2020 DAILY TRAFFIC PROJECTIONS
ALTERNATIVE C

BELLOMO-McGEE, INC. BMI

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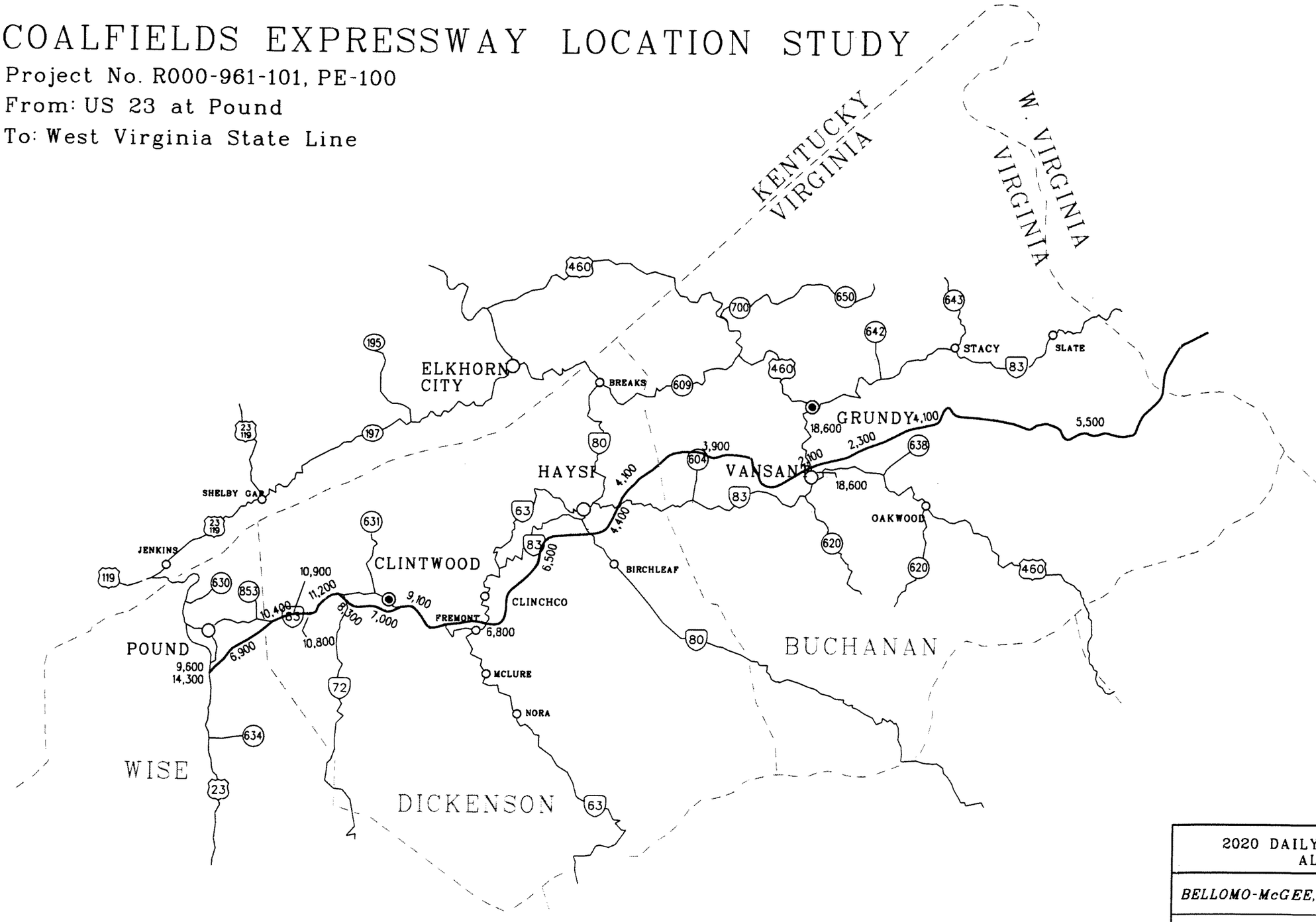
703 / 847-3071

Figure16

Approx. Scale:
1" = 4.5 miles

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



2020 DAILY TRAFFIC PROJECTIONS
ALTERNATIVE D

BELLOMO-McGEE, INC. BMI

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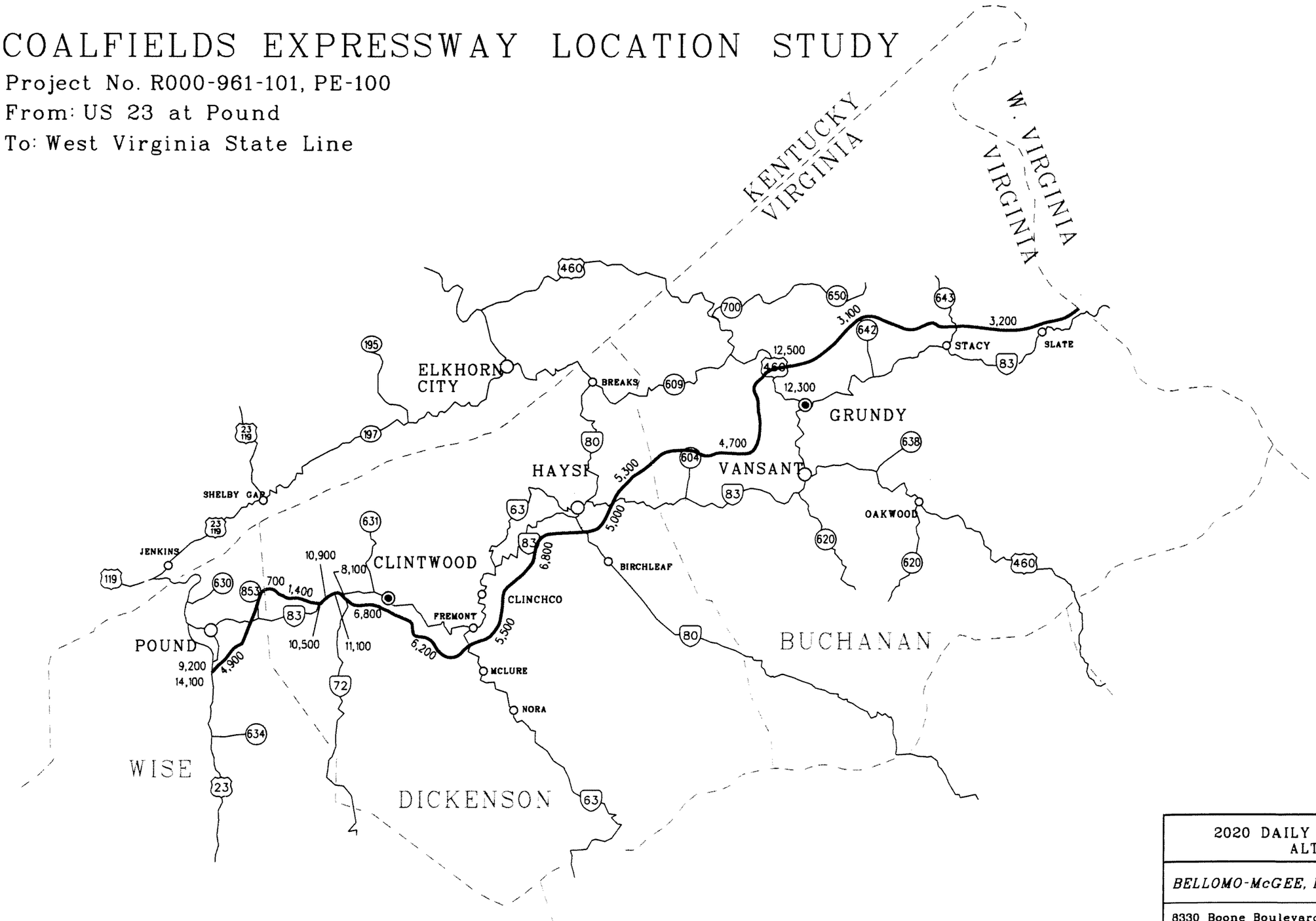
Vienna, Virginia 22182
703 / 847-3071

Figure17

Approx. Scale:
1" = 4.5 miles

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



2020 DAILY TRAFFIC PROJECTIONS
ALTERNATIVE E

BELLOMO-McGEE, INC. BMI

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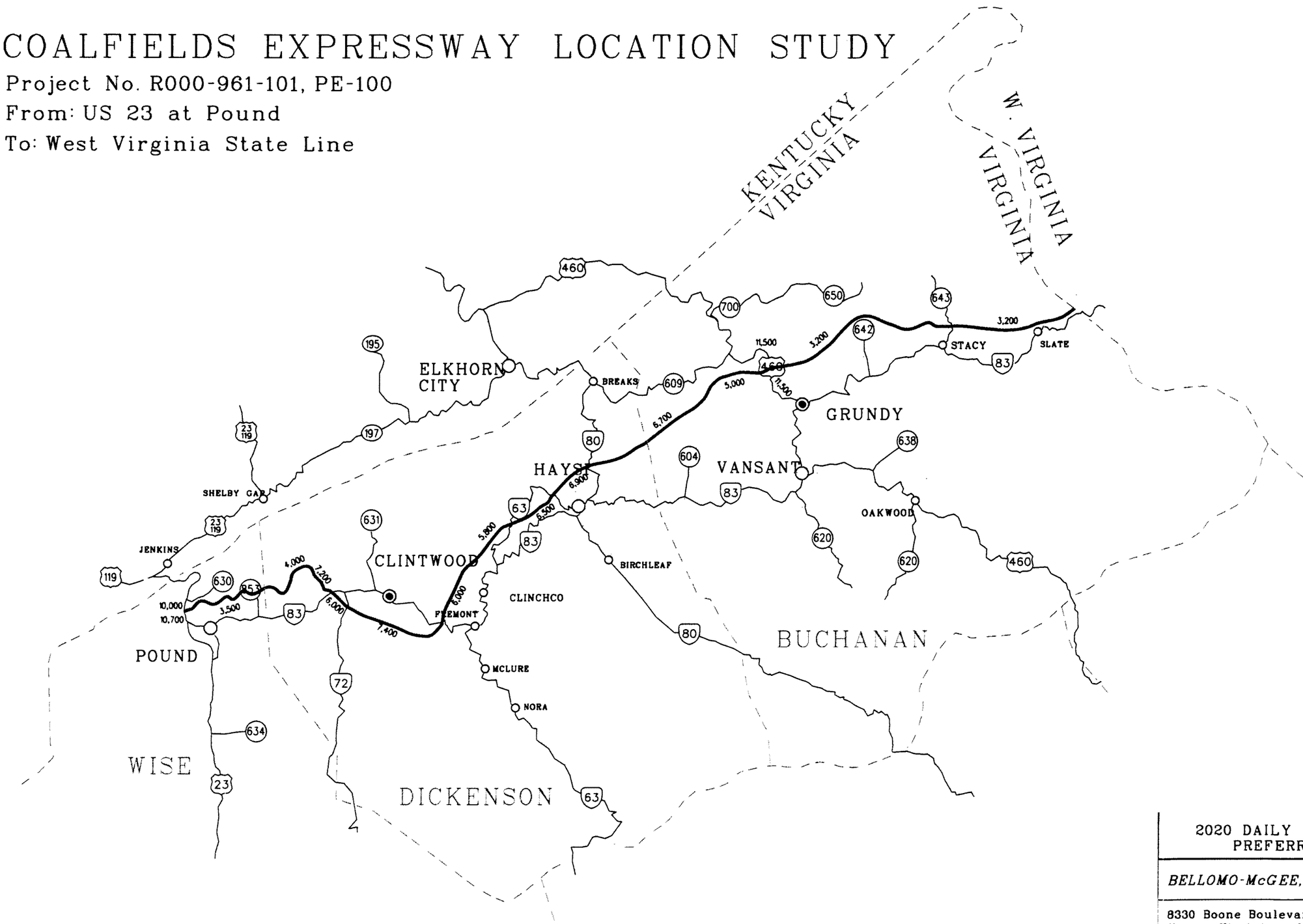
Vienna, Virginia 22182
703 / 847-3071

Figure18

Approx. Scale:
1" = 4.5 miles

COALFIELDS EXPRESSWAY LOCATION STUDY

Project No. R000-961-101, PE-100
From: US 23 at Pound
To: West Virginia State Line



2020 DAILY TRAFFIC PROJECTIONS
PREFERRED ALTERNATIVE

BELLOMO-McGEE, INC. BMI

8330 Boone Boulevard-Suite 700
Vienna, Virginia 22182
703 / 847-3071

Figure19

Approx. Scale:
1" = 4.5 miles

Table 15. 2020 Average Daily Traffic Projections (1,000's)

Wise/Dickenson County Line			Alternative	Dickenson/Buchanan County Line		
Total	Route 83	Alternative Alignment		Alternative Alignment	Route 83	Total
5.5	5.5	------	**Existing**	------	2.8	2.8
6.6	6.6	------	**No Build**	------	3.9	3.9
10.7	*	10.7	**A**	6.4	2.6	9.0
9.3	5.4	3.9	**B**	6.7	2.8	9.5
10.9	*	10.9	**C**	7.9	1.6	9.5
10.8	*	10.8	**D**	3.9	2.4	6.3
11.2	9.1	1.4	**E**	4.7	3.7	8.4

*Alternative follows existing VA 83 alignment.

All segments of each 2020 Build alternative alignment are projected to operate at LOS A.

3.2 Traffic Evaluation

The five build alternatives were evaluated in terms of three measures of effectiveness: 1) accessibility to Breaks Interstate Park, 2) corridor mobility and 3) effects on high accident locations.

Accessibility to Breaks Interstate Park

Table 16 summarizes projected travel times from Breaks Interstate Park to areas east, south and west of the study area. Alternative A performs best under this MOE since it passes closest to the Park as compared to the other alternatives.

Table 16. Accessibility to Breaks Park (minutes)

Alternatives	Breaks Park to:		
	Route 83 at WVA State Line	US 460 South	US 23 South
No Build	83	77	83
A	68	68	61
B	69	73	66
C	69	69	66
D	69	73	65
E	73	76	67

Corridor Mobility

Table 17 presents travel time estimates for through and local types of trips under the various alternative alignments. All build alternatives will provide significant travel time savings through trips (e.g., WVA State Line to US 23 South). For more local trips, Alternative C appears to provide the best service, although Alternatives B and E also provide good local service in many portions of the corridor.

Table 17. Corridor Mobility (minutes)

Alternatives	WVA State Line to US 23	Grundy to Haysi	Haysi to Pound
No Build	124	41	44
A	84	40	38
B	83	29	32
C	78	25	30
D	84	41	32
E	84	31	33

Effects on High Accident Locations

All of the alternatives bypass the high accident locations along VA 83, which will reduce traffic volumes on these high accident sections.

4.0 2020 US 460 CONNECTOR TRAFFIC ANALYSIS

2020 traffic forecasts and the associated environmental traffic data were produced for the proposed US 460 connector, which is shown in Figure 20. The traffic forecasts were developed using the model previously developed for the Coalfields Expressway Study. Traffic data was developed for the preferred Coalfields Expressway alternative, the proposed US 460 connector, existing US 460 north of the preferred Coalfields Expressway alternative, and VA Route 80 between the US 460 connector and the preferred Coalfields Expressway alternative. Other road segments in the area showed no significant change in traffic due to addition of the US 460 connector.

The projected traffic data is shown below for 2020 No Build (Table 18) and Build (Table 19) conditions. Note that the preferred Coalfields Expressway alternative was assumed to be in place for the US 460 connector no build and build analyses. An analysis of existing conditions was not performed since neither the US 460 connector nor the Coalfields Expressway are in place today.

Travel time savings in relation to Breaks was evaluated since this was one of the objectives of the Coalfields project. The proposed alignment for the US 460 connector provides an estimated time saving of just under seven minutes from Breaks to Grundy and other points to the east. For Haysi and other points to the west, the time savings is zero; that is, VA 80 provides a faster trip.

Table 18. 2020 No-Build Traffic and Level of Service

Segment				Volume (ADT)	AM Peak			PM Peak		
#	Roadway	From	To		Vol.	Pk. Dir.	LOS	Vol.	Pk. Dir.	LOS
1	Preferred Coalfields Alt.	Existing US 460	US 460 Connector	5000	350	210	A	400	260	A
2	Preferred Coalfields Alt.	US 460 Connector	VA 80	6700	470	280	A	550	380	A
3	US 460 Connector	VA 80	Preferred Coalfields Alt.	-	-	-	-	-	-	-
4	VA 80	US 460 Connector	Preferred Coalfields Alt.	2200	155	90	B	175	105	B
5	Existing US 460	Preferred Coalfields Alt.	VA 609	11500	805	485	D	920	550	D
6	Existing US 460	VA 609	VA 700	6900	485	290	D	552	330	D

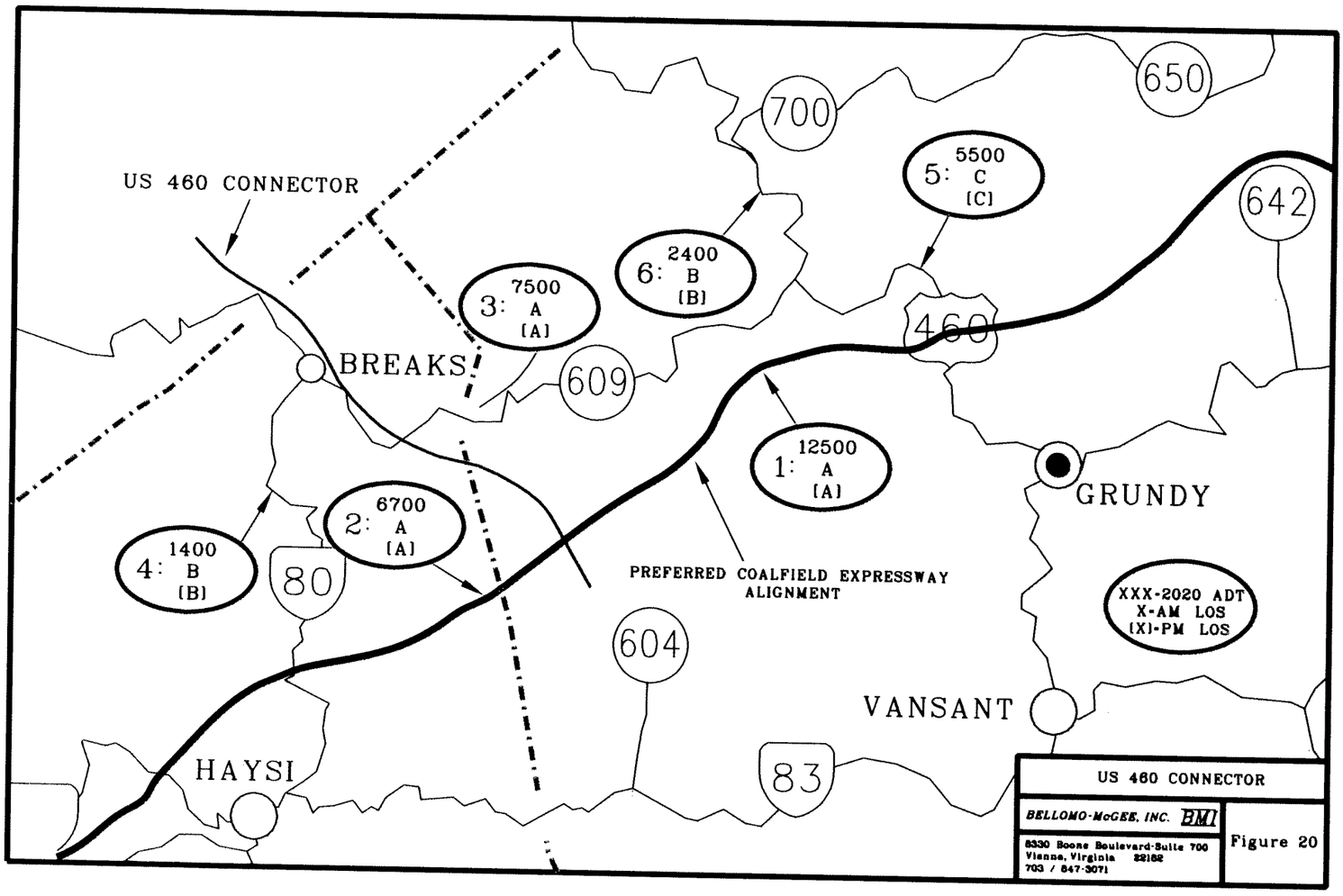

US 460 CONNECTOR
BREAKS
HAYSI
GRUNDY
VANSANT
700
650
642
460
609
80
604
83
1: 12500 A [A]
2: 6700 A [A]
3: 7500 A [A]
4: 1400 B [B]
5: 5500 C [C]
6: 2400 B [B]
PREFERRED COALFIELD EXPRESSWAY ALIGNMENT
XXX-2020 ADT
X-AM LOS
[X]-PM LOS
US 460 CONNECTOR
BELLOMO-McGEE, INC. BMI
8330 Boone Boulevard-Suite 700
Vienna, Virginia 22182
703 / 847-3071
Figure 20

Table 19. 2020 US 460 Connector Build Traffic and Level of Service

Segment				Volume (ADT)	AM Peak			PM Peak		
#	Roadway	From	To		Vol.	Pk. Dir.	LOS	Vol.	Pk. Dir.	LOS
1	Preferred Coalfields Alt.	Existing US 460	US 460 Connector	12500	965	600	A	1000	650	A
2	Preferred Coalfields Alt.	US 460 Connector	VA 80	6700	475	310	A	530	380	A
3	US 460 Connector	VA 80	Preferred Coalfields Alt.	7500	600	345	A	680	375	A
4	VA 80	US 460 Connector	Preferred Coalfields Alt.	1400	100	60	B	110	65	B
5	Existing US 460	Preferred Coalfields Alt.	VA 609	5500	385	230	C	440	265	C
6	Existing US 460	VA 609	VA 700	2400	170	100	B	190	115	B

APPENDIX A
MECHANICAL TRAFFIC COUNT DATA

Counted by:CHI ASSOC., INC.
Board # :406
Other :
Street name :US 23 BUSINESS - (NORTH OF POUND)

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-1
Start Date: 08/19/97
File I.D. : T1_F1
Page : 2

Begin Time	<------ NB ------>				<------ SB ------>				<------ N/S Combined ------>				Wednesday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
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12:30	2		22		0		23		2		45		
12:45	1	12	23	89	1	10	13	76	2	22	36	165	
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01:15	0		21		0		18		0		39		
01:30	2		20		2		22		4		42		
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02:15	0		16		0		11		0		27		
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03:00	1		23		0		25		1		48		
03:15	3		22		3		29		6		51		
03:30	1		32		3		23		4		55		
03:45	1	6	24	101	0	6	20	97	1	12	44	198	
04:00	1		32		0		13		1		45		
04:15	1		30		1		21		2		51		
04:30	5		22		4		25		9		47		
04:45	5	12	35	119	2	7	23	82	7	19	58	201	
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05:15	7		22		3		19		10		41		
05:30	3		28		2		23		5		51		
05:45	18	34	31	111	4	16	16	88	22	50	47	199	
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06:15	11		21		10		11		21		32		
06:30	14		20		24		18		38		38		
06:45	13	46	20	80	13	48	18	68	26	94	38	148	
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07:15	9		12		10		20		19		32		
07:30	17		12		11		13		28		25		
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09:15	10		12		9		16		19		28		
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10:15	14		2		24		5		38		7		
10:30	17		2		16		2		33		4		
10:45	18	60	5	18	18	76	8	22	36	136	13	40	
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11:15	23		4		14		10		37		14		
11:30	13		3		24		2		37		5		
11:45	22	87	3	14	15	67	9	27	37	154	12	41	
Totals	436		854		422		771		858		1625		
		1290				1193				2483			
%	50.8%		52.5%		49.1%		47.4%						
Peak Hour Time	10:30		04:00		07:45		04:15		11:00		04:15		
	87		119		83		99		154		216		
P.F.	.75		.85		.69		.82		.89		.9		

unted by:CHI ASSOC., INC.
Board # :202
her :
reet name :US 23 BUSINESS (SOUTH OF POUND)

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-2
Start Date: 08/19/97
File I.D. : T2_F1

N/S

Begin Time	<------ NB ------> A.M.		P.M.		<------ SB ------> A.M.		P.M.		<------Combined ------> A.M.		P.M.	
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12:30	5		52		5		54		10		106	
:45	15	38	41	194	5	25	48	230	20	63	89	424
:00	4		50		4		63		8		113	
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5:30	26		88		16		53		42		141	
5:45	17	61	73	344	46	103	45	287	63	164	118	631
6:	19		61		44		37		63		98	
6:15	29		58		42		46		71		104	
6:30	37		62		54		46		91		108	
6:45	31	116	65	246	33	173	40	169	64	289	105	415
7:00	29		48		37		36		66		84	
7:15	42		36		56		23		98		59	
7:30	44		32		132		30		176		62	
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:30	37		42		72		29		109		71	
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:15	35		27		57		22		92		49	
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30	46		24		61		18		107		42	
45	55	179	16	81	58	210	7	56	113	389	23	137
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15	60		18		48		4		108		22	
30	58		23		64		3		122		26	
45	60	227	18	80	47	221	4	18	107	448	22	98
ils	1167		2500		1748		2219		2915		4719	
Totals		3667				3967				7634		
	40.0%		52.9%		59.9%		47.0%					
Hour	11:00		04:45		07:30		03:00		07:30		03:00	
me	227		375		494		374		658		699	
F.	.94		.90		.88		.86		.91		.86	

unted by:CHI ASSOC., INC.
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reet name :US 23 BUSINESS (SOUTH OF POUND)

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-2
Start Date: 08/19/97
File I.D. : T2_P1

M/S

egin	<------		------><------				------><------Combined				------>	Wednesday
ime	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
:00 08/20	19		69		6		76		25		145	
:15	13		49		2		56		15		105	
2:30	15		53		1		72		16		125	
:45	9	56	57	228	3	12	56	260	12	68	113	488
:00	7		67		4		56		11		123	
1:15	3		59		1		57		4		116	
1:30	6		59		4		64		10		123	
:45	10	26	58	243	2	11	78	255	12	37	136	498
2:00	8		65		6		58		14		123	
2:15	8		71		0		65		8		136	
2:30	3		69		1		69		4		138	
2:45	4	23	60	265	3	10	63	255	7	33	123	520
3:00	11		66		4		86		15		152	
3:15	11		69		5		66		16		135	
3:30	5		82		3		106		8		188	
3:45	2	29	76	293	1	13	81	339	3	42	157	632
4:00	1		80		3		65		4		145	
4:15	5		88		4		53		9		141	
4:30	5		91		17		56		22		147	
4:45	3	14	91	350	14	38	61	235	17	52	152	585
5:00	4		84		13		52		17		136	
5:15	16		100		16		62		32		162	
5:30	13		85		22		54		35		139	
5:45	6	39	76	345	33	84	46	214	39	123	122	559
6:00	17		85		59		51		76		136	
6:15	31		77		38		32		69		109	
6:30	31		46		55		43		86		89	
6:45	27	106	58	266	43	195	31	157	70	301	89	423
:00	21		40		41		33		62		73	
:15	33		39		75		34		108		73	
:30	46		46		91		41		137		87	
:45	62	162	38	163	114	321	26	134	176	483	64	297
:00	52		43		125		26		177		69	
:15	29		41		121		22		150		63	
:30	43		34		77		25		120		59	
:45	34	158	21	139	58	381	18	91	92	539	39	230
:00	41		36		67		25		108		61	
:15	48		28		75		15		123		43	
30	38		25		80		24		118		49	
45	37	164	28	117	65	287	17	81	102	451	45	198
00	37		31		88		22		125		53	
15	46		24		63		10		109		34	
30	54		12		73		11		127		23	
45	45	182	16	83	52	276	5	48	97	458	21	131
00	66		20		60		8		126		28	
15	56		26		57		6		113		32	
30	58		31		65		2		123		33	
45	62	242	22	99	87	269	9	25	149	511	31	124
ils	1201		2591		1897		2094		3098		4685	
Totals		3792				3991				7783		
	38.7%		55.3%		61.2%		44.7%					
Hour	11:00		04:30		07:30		03:00		07:30		03:00	
me	242		366		451		339		640		632	
F.	.91		.91		.90		.79		.90		.84	

nted by:CHI ASSOC., INC.
rd # :405
er :
eet name :VA 83 @ WISE/DICKENSON COUNTY LINE

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-3
Start Date: 08/19/97
File I.D. : T3_F1

Tuesday

in	<------ E.B		------>		<------ WB		------>		<------Combined		------>	
e	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
00 08/19	7		42		5		44		12		86	
15	10		37		2		49		12		86	
30	5		43		3		33		8		76	
45	3	25	38	160	3	13	45	171	6	38	83	331
00	10		29		1		47		11		76	
15	3		20		2		54		5		74	
30	4		49		4		52		8		101	
45	4	21	47	145	7	14	39	192	11	35	86	337
00	5		43		4		41		9		84	
15	5		56		0		51		5		107	
30	4		52		3		44		7		96	
45	1	15	52	203	3	10	47	183	4	25	99	386
00	2		33		1		54		3		87	
15	12		44		3		51		15		95	
30	8		83		4		43		12		126	
15	20	42	69	229	3	11	36	184	23	53	105	413
00	5		50		3		42		8		92	
15	6		58		7		42		13		100	
30	3		57		21		37		24		94	
15	9	23	68	233	8	39	44	165	17	62	112	398
00	10		66		13		57		23		123	
15	15		71		25		39		40		110	
30	24		65		32		35		56		100	
15	23	72	54	256	37	107	27	158	60	179	81	414
00	28		44		40		43		68		87	
15	22		45		49		33		71		78	
30	17		47		52		33		69		80	
15	21	88	42	178	34	175	25	134	55	263	67	312
00	33		30		38		23		71		53	
15	35		29		50		13		85		42	
30	46		25		73		28		119		53	
15	35	149	30	114	53	214	18	82	88	363	48	196
00	35		18		67		17		102		35	
15	31		26		53		14		84		40	
30	31		24		36		17		67		41	
15	49	146	12	80	44	200	19	67	93	346	31	147
00	34		24		35		14		69		38	
15	18		18		55		12		73		30	
30	28		15		44		7		72		22	
15	29	109	19	76	36	170	17	50	65	279	36	126
00	23		19		43		11		66		30	
15	15		21		39		13		54		34	
30	33		14		43		3		76		17	
15	40	111	12	66	29	154	8	35	69	265	20	101
00	41		13		31		5		72		18	
15	43		13		52		2		95		15	
30	39		16		43		2		82		18	
15	38	161	15	57	51	177	1	10	89	338	16	67
:	962		1797		1284		1431		2246		3228	
tals		2759				2715				5474		
	42.8%		55.6%		57.1%		44.3%					
our	10:45		04:45		07:30		00:45		07:15		04:45	
	163		270		246		198		394		445	
	.94		.95		.84		.91		.82		.90	

er :SUNNY/DRY
nted by:CHI ASSOC., INC.
rd / :405
:

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-3
Start Date: 08/19/97
File I.D. : T3_F1

t name :VA 83 @ WISE/DICKENSON COUNTY LINE

E/W

Page : 2

in	<------ EB ------>				<------ WB ------>				<------Combined ------>				
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wednesday
08/20	16		48		0		45		16		93		
15	11		44		3		46		14		90		
30	6		28		0		61		6		89		
5	10	43	45	165	2	5	34	186	12	48	79	351	
30	4		39		1		47		5		86		
15	8		38		1		34		9		72		
0	4		44		0		40		4		84		
5	3	19	38	159	4	6	65	186	7	25	103	345	
00	10		44		5		44		15		88		
5	5		48		0		43		5		91		
0	3		47		1		35		4		82		
45	3	21	52	191	3	9	37	159	6	30	89	350	
00	1		39		4		45		5		84		
5	9		54		5		58		14		112		
30	5		69		3		43		8		112		
45	6	21	65	227	1	13	52	198	7	34	117	425	
0	0		47		6		37		6		84		
5	6		71		12		47		18		118		
10	2		70		9		45		11		115		
15	6	14	76	264	13	40	42	171	19	54	118	435	
0	6		57		9		46		15		103		
5	13		83		20		40		33		123		
0	11		57		27		25		38		82		
5	14	44	66	263	42	98	37	148	56	142	103	411	
0	20		50		36		33		56		83		
5	17		54		36		25		53		79		
0	24		53		68		30		92		83		
5	14	75	34	191	38	178	28	116	52	253	62	307	
0	17		31		23		31		40		62		
	27		25		56		28		83		53		
	33		21		45		24		78		45		
	43	120	20	97	50	174	14	97	93	294	34	194	
	43		23		55		21		98		44		
	29		22		44		12		73		34		
	34		24		55		13		89		37		
	24	130	24	93	38	192	15	61	62	322	39	154	
	31		14		47		25		78		39		
	38		19		49		10		87		29		
	31		23		59		15		90		38		
	25	125	17	73	41	196	26	76	66	321	43	149	
	27		14		52		13		79		27		
	20		15		55		10		75		25		
	48		16		36		4		84		20		
	36	131	12	57	40	183	8	35	76	314	20	92	
	33		13		46		3		79		16		
	33		24		45		3		78		27		
	39		20		51		7		90		27		
	40	145	23	80	53	195	11	24	93	340	34	104	
	888		1860		1289		1457		2177		3317		
		2748				2746				5494			
	40.7%		56.0%		59.2%		43.9%						
ur	10:30		04:30		09:30		03:00		07:45		04:30		
	150		286		207		198		353		459		
	.78		.86		.87		.85		.90		.93		

/DKI
SSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-4
Start Date: 08/19/97
File I.D. : T4_F1

t name :VA 83 BETWEEN SR 779 AND SR 664 E/W

in	<------WESTBOUND------>				<------EASTBOUND------>				<------Combined------>				Tuesday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
08/19	5		22		2		25		7		47		
	7		42		1		25		8		67		
30	3		24		1		35		4		59		
	3	18	26	114	1	5	31	116	4	23	57	230	
	1		42		1		28		2		70		
15	2		23		0		19		2		42		
	1		31		6		45		7		76		
	1	5	30	126	2	9	33	125	3	14	63	251	
00	1		42		7		19		8		61		
15	1		38		0		28		1		66		
	0		36		1		43		1		79		
45	4	6	36	152	0	8	40	130	4	14	76	282	
00	0		33		1		36		1		69		
	1		28		4		23		5		51		
	4		42		0		27		4		69		
45	6	11	48	151	0	5	32	118	6	16	80	269	
	2		51		1		24		3		75		
5	19		37		3		28		22		65		
30	6		41		7		31		13		72		
15	9	36	42	171	3	14	24	107	12	50	66	278	
	6		35		13		23		19		58		
.5	17		57		5		21		22		78		
0	12		33		12		19		24		52		
5	11	46	42	167	4	34	16	79	15	80	58	246	
0	14		34		23		20		37		54		
5	25		22		26		18		51		40		
0	16		18		31		14		47		32		
5	17	72	18	92	14	94	17	69	31	166	35	161	
0	26		20		17		19		43		39		
5	24		29		36		13		60		42		
0	24		21		44		20		68		41		
5	50	124	27	97	29	126	5	57	79	250	32	154	
0	27		18		31		12		58		30		
5	28		16		29		19		57		35		
0	16		13		32		13		48		26		
5	32	103	15	62	25	117	17	61	57	220	32	123	
0	22		16		38		14		60		30		
	42		10		23		8		65		18		
	38		13		27		5		65		18		
	33	135	12	51	18	106	8	35	51	241	20	86	
	29		6		28		11		57		17		
	23		10		25		3		48		13		
	19		11		31		9		50		20		
	43	114	8	35	38	122	11	34	81	236	19	69	
	29		7		25		0		54		7		
	31		4		16		2		47		6		
	40		2		24		4		64		6		
	42	142	10	23	25	90	1	7	67	232	11	30	
	812		1241		730		938		1542		2179		
tals		2053				1668				3721			
	52.6%		56.9%		47.3%		43.0%						
our	10:45		03:30		07:15		02:15		07:15		03:45		
	143		178		140		147		265		292		
	.83		.87		.79		.85		.83		.91		

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-4
Start Date: 08/19/97
File I.D. : T4_F1

er :
t name :VA 83 BETWEEN SR 779 AND SR 664 E/W

	<------ Westbound				<------ East Bound				<------ Combined				------>
e	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wednesday
00	7		36		0		29		7		65		
5	5		25		1		29		6		54		
30	3		31		1		39		4		70		
45	3	18	31	123	0	2	27	124	3	20	58	247	
0	3		36		3		28		6		64		
5	1		22		1		27		2		49		
30	3		29		4		28		7		57		
5	1	8	37	124	0	8	30	113	1	16	67	237	
0	2		29		1		20		3		49		
15	1		36		3		23		4		59		
30	2		22		1		37		3		59		
5	0	5	46	133	1	6	30	110	1	11	76	243	
0	2		47		0		32		2		79		
15	1		24		2		24		3		48		
0	3		43		2		42		5		85		
5	1	7	40	154	0	4	24	122	1	11	64	276	
00	3		52		1		34		4		86		
15	5		37		3		20		8		57		
0	2		45		3		18		5		63		
45	4	14	43	177	10	17	10	82	14	31	53	259	
00	3		42		10		30		13		72		
5	9		37		9		17		18		54		
30	12		52		9		22		21		74		
45	19	43	43	174	8	36	16	85	27	79	59	259	
00	14		30		17		25		31		55		
15	14		25		22		24		36		49		
30	9		42		23		19		32		61		
45	27	64	21	118	18	80	20	88	45	144	41	206	
00	24		15		15		15		39		30		
15	21		17		38		20		59		37		
30	32		16		31		9		63		25		
15	46	123	26	74	34	118	19	63	80	241	45	137	
00	15		21		39		13		54		34		
5	30		11		27		17		57		28		
0	24		13		34		14		58		27		
5	24	93	8	53	31	131	12	56	55	224	20	109	
0	34		12		34		16		68		28		
5	36		8		22		8		58		16		
0	25		12		28		6		53		18		
5	40	135	13	45	29	113	6	36	69	248	19	81	
0	33		10		19		9		52		19		
5	26		8		25		3		51		11		
0	29		14		21		8		50		22		
5	25	113	10	42	37	102	2	22	62	215	12	64	
0	40		5		26		4		66		9		
5	30		8		28		1		58		9		
0	23		5		20		2		43		7		
	38	131	10	28	20	94	2	9	58	225	12	37	
s	754		1245		711		910		1465		2155		
otals		1999				1621				3620			
%	51.4%		57.7%		48.5%		42.2%						
Hour	09:00		04:00		07:15		02:45		07:15		03:30		
e	135		177		142		128		256		292		
.	.84		.85		.91		.76		.8		.84		

d by: CHI ASSOC., INC.
/ :305
:
name :VA 83 @ PRATER

TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-5
Start Date: 08/18/97
File I.D. : 5T_PADJ

E/W

Page : 1

	<------ WB ------>				<------ EB ------>				<------Combined ------>				
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Monday
08/	1		35		1		26		2		61		
	6		17		0		9		6		26		
	3		29		2		29		5		58		
	2	12	19	100	2	5	24	88	4	17	43	188	
	1		17		2		35		3		52		
	0		27		3		20		3		47		
	2		25		0		25		2		50		
	3	6	22	91	1	6	23	103	4	12	45	194	
	0		14		0		20		0		34		
	2		19		2		18		4		37		
	0		29		0		27		0		56		
	0	2	14	76	1	3	26	91	1	5	40	167	
	1		16		0		32		1		48		
	2		15		5		38		7		53		
	3		19		0		25		3		44		
	3	9	22	72	2	7	31	126	5	16	53	198	
	5		20		2		31		7		51		
	8		17		6		26		14		43		
	7		20		2		28		9		48		
	12	32	18	75	3	13	41	126	15	45	59	201	
	8		22		7		30		15		52		
	12		19		4		52		16		71		
	18		10		3		36		21		46		
	21	59	15	66	3	17	28	146	24	76	43	212	
	10		13		4		28		14		41		
	23		18		13		25		36		43		
	19		15		10		17		29		32		
	24	76	8	54	15	42	21	91	39	118	29	145	
	37		9		24		16		61		25		
	27		15		18		27		45		42		
	36		8		15		10		51		18		
	37	137	10	42	19	76	20	73	56	213	30	115	
	32		12		15		16		47		28		
	23		9		27		12		50		21		
	31		14		14		12		45		26		
	25	111	12	47	12	68	9	49	37	179	21	96	
	21		3		26		16		47		19		
	24		8		16		9		40		17		
	18		7		23		6		41		13		
	13	76	11	29	16	81	8	39	29	157	19	68	
	20		3		16		2		36		5		
	22		5		17		6		39		11		
	27		7		24		9		51		16		
	21	90	3	18	21	78	5	22	42	168	8	40	
	18		8		25		4		43		12		
	29		5		20		1		49		6		
	16		7		25		8		41		15		
	25	88	0	20	22	92	4	17	47	180	4	37	
	698		690		488		971		1186		1661		
als		1388				1459				2847			
	58.8%		41.5%		41.1%		58.4%						
ur	07:00		00:00		11:00		04:45		07:00		04:30		
	137		100		92		159		213		230		
	.92		.71		.92		.76		.87		.80		

ted by: CHI ASSOC., INC.
ard / :305
her :
et name :VA 83 @ PRATER

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-5
Start Date: 08/18/97
File I.D. : 5T_PADJ

E/W

Page : 2

n	<------ WB				------><------ EB				------><------Combined				------>
me	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tuesday
00 08/19	0		26		5		46		5		72		
15	3		21		1		40		4		61		
:30	0		18		2		17		2		35		
:45	1	4	23	88	1	9	30	133	2	13	53	221	
00	2		23		1		27		3		50		
.15	0		27		1		26		1		53		
1:30	2		18		3		34		5		52		
45	0	4	27	95	2	7	17	104	2	11	44	199	
00	2		23		1		18		3		41		
2:15	0		21		2		18		2		39		
:30	1		30		0		26		1		56		
45	0	3	15	89	1	4	33	95	1	7	48	184	
3:00	3		18		0		39		3		57		
3:15	0		16		0		27		0		43		
30	1		18		2		32		3		50		
.45	6	10	23	75	3	5	30	128	9	15	53	203	
4:00	5		21		3		27		8		48		
15	6		16		0		29		6		45		
30	15		21		5		42		20		63		
1:45	15	41	19	77	1	9	29	127	16	50	48	204	
:00	6		23		5		53		11		76		
15	10		20		7		37		17		57		
:30	15		9		5		29		20		38		
:45	16	47	16	68	12	29	29	148	28	76	45	216	
:00	17		14		6		23		23		37		
:1	23		19		4		18		27		37		
:30	26		16		9		22		35		38		
:45	18	84	7	56	7	26	17	80	25	110	24	136	
:00	32		10		24		28		56		38		
:15	29		16		12		11		41		27		
:30	35		9		14		19		49		28		
:45	33	129	11	46	14	64	17	75	47	193	28	121	
:00	33		13		14		13		47		26		
:15	30		10		25		13		55		23		
:30	28		14		17		10		45		24		
:45	13	104	13	50	21	77	17	53	34	181	30	103	
:00	16		5		21		1		37		6		
:15	19		9		17		7		36		16		
:30	17		8		12		10		29		18		
45	14	66	12	34	15	65	3	21	29	131	15	55	
00	24		4		23		7		47		11		
15	21		7		16		11		37		18		
30	20		5		10		6		30		11		
45	22	87	3	19	18	67	5	29	40	154	8	48	
00	15		1		4		4		19		5		
15	16		7		28		1		44		8		
30	15		5		9		8		24		13		
45	22	68	8	21	10	51	4	17	32	119	12	38	
als	647		718		413		1010		1060		1728		
Totals		1365				1423				2788			
	61.0%		41.5%		38.9%		58.4%						
Hour	07:30		01:45		08:15		04:30		07:30		04:30		
me	131		101		84		161		198		244		
P.	.93		.84		.84		.75		.9		.80		

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-6
Start Date: 08/19/97
File I.D. : T6_F1
Page : 1

03

her :

eet name :VA 83/US 460 BETWEEN VANSANT & GRUNDY N/S

in	<------ NB		------>		<------ SB		------>		<------Combined		------>		Tuesday
ime	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
00 08/19	8		128		6		126		14		254		
15	13		130		3		108		16		238		
2:30	11		134		10		108		21		242		
:45	6	38	169	561	6	25	107	449	12	63	276	1010	
00	11		143		7		100		18		243		
1:15	4		122		2		105		6		227		
1:30	9		144		5		102		14		246		
45	15	39	141	550	7	21	106	413	22	60	247	963	
..00	5		129		1		117		6		246		
2:15	3		140		2		104		5		244		
30	5		124		2		134		7		258		
45	1	14	155	548	3	8	122	477	4	22	277	1025	
3:00	4		168		7		109		11		277		
:15	3		138		3		126		6		264		
:30	10		158		9		134		19		292		
:45	5	22	148	612	5	24	121	490	10	46	269	1102	
4:00	10		129		2		129		12		258		
:15	8		118		3		129		11		247		
:30	14		128		8		117		22		245		
4:45	14	46	162	537	10	23	124	499	24	69	286	1036	
:00	29		170		15		140		44		310		
:15	25		148		25		149		50		297		
:30	38		121		14		103		52		224		
5:45	39	131	127	566	29	83	108	500	68	214	235	1066	
:0	39		132		26		79		65		211		
:1	46		117		40		89		86		206		
6:30	55		113		60		55		115		168		
:45	64	204	105	467	48	174	86	309	112	378	191	776	
:00	50		90		37		73		87		163		
:15	81		66		56		76		137		142		
:30	136		86		74		54		210		140		
:45	184	451	69	311	79	246	55	258	263	697	124	569	
:00	139		74		95		61		234		135		
:15	176		75		97		68		273		143		
:30	137		70		84		65		221		135		
:45	148	600	51	270	96	372	50	244	244	972	101	514	
:00	115		62		93		45		208		107		
:15	104		43		105		26		209		69		
:30	108		37		102		24		210		61		
:45	104	431	35	177	90	390	31	126	194	821	66	303	
:00	97		32		100		20		197		52		
:15	90		33		92		20		182		53		
:30	133		17		91		31		224		48		
:45	118	438	19	101	97	380	12	83	215	818	31	184	
00	131		23		96		18		227		41		
15	123		20		97		21		220		41		
30	130		22		127		13		257		35		
45	129	513	11	76	154	474	14	66	283	987	25	142	
als	2927		4776		2220		3914		5147		8690		
totals		7703				6134				13837			
	56.8%		54.9%		43.1%		45.0%						

k Hour	07:45	02:45	11:00	04:30	07:45	04:30
ume	636	619	474	530	991	1138
.F.	.86	.92	.76	.88	.90	.91

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-6
Start Date: 08/19/97
File I.D. : T6_F1
Page : 2

her :

et name :VA 83/US 460 BETWEEN VANSANT & GRUNDY N/S

	<------ NB				------><------ SB				------><------Combined				------>
me	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wednesday
00 08/20	15		161		6		144		21		305		
.5	15		158		15		141		30		299		
:30	14		135		5		116		19		251		
:45	4	48	136	590	3	29	138	539	7	77	274	1129	
00	11		130		10		126		21		256		
.15	11		149		4		128		15		277		
:30	7		154		3		117		10		271		
15	5	34	147	580	4	21	121	492	9	55	268	1072	
00	7		129		2		113		9		242		
:15	2		149		5		113		7		262		
30	1		132		2		137		3		269		
15	6	16	164	574	0	9	129	492	6	25	293	1066	
:00	4		158		2		124		6		282		
:15	8		125		4		125		12		250		
30	5		147		13		152		18		299		
.45	12	29	146	576	2	21	130	531	14	50	276	1107	
:00	5		155		10		128		15		283		
15	10		147		3		133		13		280		
30	5		165		6		132		11		297		
:45	19	39	140	607	7	26	117	510	26	65	257	1117	
:00	22		154		14		171		36		325		
15	30		134		17		111		47		245		
:30	38		118		20		107		58		225		
:45	45	135	118	524	20	71	102	491	65	206	220	1015	
:00	40		98		27		79		67		177		
:15	38		104		40		84		78		188		
:30	47		100		54		90		101		190		
:45	49	174	87	389	54	175	87	340	103	349	174	729	
:00	62		79		43		69		105		148		
:15	88		77		44		58		132		135		
30	125		77		69		68		194		145		
45	171	446	80	313	74	230	68	263	245	676	148	576	
00	138		67		84		51		222		118		
15	134		80		104		50		238		130		
30	131		76		90		51		221		127		
45	140	543	84	307	94	372	54	206	234	915	138	513	
00	96		61		88		36		184		97		
15	110		42		82		67		192		109		
30	90		43		82		32		172		75		
45	104	400	34	180	104	356	29	164	208	756	63	344	
00	115		29		100		27		215		56		
15	116		30		96		35		212		65		
30	116		22		100		24		216		46		
15	109	456	26	107	135	431	18	104	244	887	44	211	
00	111		21		105		14		216		35		
.5	131		37		121		9		252		46		
0	150		29		122		23		272		52		
5	150	542	13	100	136	484	12	58	286	1026	25	158	
ls	2862		4847		2225		4190		5087		9037		
Totals		7709				6415				14124			
	56.2%		53.6%		43.7%		46.3%						

Hour	07:45	03:45	11:00	04:15	11:00	04:15
me	574	613	484	553	1026	1159
F.	.83	.92	.88	.80	.89	.89

ted by:Chi Assoc., Inc.
..d # :407
her :

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-7
Start Date: 08/19/97
File I.D. : T7_F1ADJ
Page : 1

et name :VA 83 BETWEEN SR 642 & SR 674

n	<------ EB		------>		<------ WB		------>		E/W <------Combined		------>		Tuesday
me	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
:00 08/19	2		22		1		32		3		54		
5	2		21		0		36		2		57		
:30	2		28		22		29		24		57		
:45	0	6	26	97	38	61	23	120	38	67	49	217	
00	0		26		7		30		7		56		
.15	2		36		0		28		2		64		
:30	0		31		0		36		0		67		
15	0	2	27	120	0	7	24	118	0	9	51	238	
00	1		36		2		29		3		65		
:15	0		49		2		39		2		88		
:30	1		28		1		27		2		55		
15	1	3	41	154	1	6	29	124	2	9	70	278	
:00	0		31		1		26		1		57		
:15	0		45		0		21		0		66		
30	2		58		0		37		2		95		
45	2	4	62	196	0	1	52	136	2	5	114	332	
:00	2		46		3		30		5		76		
15	1		43		3		18		4		61		
30	2		42		3		32		5		74		
:45	0	5	42	173	4	13	26	106	4	18	68	279	
:00	6		61		3		28		9		89		
15	10		72		8		36		18		108		
.30	10		46		10		21		20		67		
:45	15	41	47	226	10	31	24	109	25	72	71	335	
:00	18		52		17		19		35		71		
:15	6		48		24		22		30		70		
:30	11		28		35		28		46		56		
45	5	40	32	160	26	102	30	99	31	142	62	259	
00	5		30		16		16		21		46		
15	17		29		26		14		43		43		
30	23		27		51		22		74		49		
45	32	77	30	116	50	143	17	69	82	220	47	185	
00	20		26		64		14		84		40		
15	12		30		55		9		67		39		
30	16		20		51		6		67		26		
45	15	63	28	104	35	205	12	41	50	268	40	145	
00	18		17		32		8		50		25		
15	24		20		28		11		52		31		
30	12		12		40		7		52		19		
45	15	69	12	61	29	129	7	33	44	198	19	94	
00	20		11		39		11		59		22		
.5	16		8		37		10		53		18		
0	18		10		33		6		51		16		
5	14	68	7	36	16	125	2	29	30	193	9	65	
0	15		9		28		2		43		11		
5	18		7		32		1		50		8		
0	25		7		40		3		65		10		
5	24	82	5	28	35	135	2	8	59	217	7	36	
ls	460		1471		958		992		1418		2463		
Totals		1931				1950				3881			
	32.4%		59.7%		67.5%		40.2%						

Hour	07:15	05:00	07:30	03:15	07:30	03:15
me	92	226	220	140	307	351
.	.71	.78	.85	.67	.91	.76

ted by:Chi Assoc., Inc.
d # :407
er :
et name :VA 83 BETWEEN SR 642 & SR 674

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-7
Start Date: 08/19/97
File I.D. : T7_F1ADJ
Page : 2

E/W

n	<------ EB ------>				<------ WB ------>				<------Combined ------>				Wednesday
me	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
0 00/20	4		25		1		32		5		57		
5	5		38		0		36		5		74		
:30	5		22		1		29		6		51		
:45	4	18	25	110	0	2	23	120	4	20	48	230	
0	2		25		0		30		2		55		
.15	2		29		1		28		3		57		
:30	1		33		0		36		1		69		
15	1	6	31	118	1	2	24	118	2	8	55	236	
0	1		33		3		29		4		62		
:15	0		34		2		39		2		73		
:30	0		34		1		27		1		61		
15	1	2	30	131	2	8	29	124	3	10	59	255	
:00	3		35		1		26		4		61		
:15	2		38		1		21		3		59		
30	0		29		0		37		0		66		
15	2	7	35	137	1	3	52	136	3	10	87	273	
:00	0		41		3		30		3		71		
15	1		27		4		30		5		57		
30	1		37		3		47		4		84		
:45	3	5	37	142	3	13	25	132	6	18	62	274	
:00	9		50		3		29		12		79		
15	10		49		8		35		18		84		
.30	4		42		8		25		12		67		
:45	17	40	27	168	11	30	13	102	28	70	40	270	
00	18		30		17		26		35		56		
15	17		33		25		25		42		58		
30	10		32		33		17		43		49		
45	10	55	19	114	26	101	14	82	36	156	33	196	
00	8		24		18		9		26		33		
15	17		15		26		5		43		20		
30	21		23		49		12		70		35		
45	35	81	20	82	50	143	5	31	85	224	25	113	
00	27		23		63		5		90		28		
15	24		20		55		10		79		30		
30	29		25		53		10		82		35		
15	16	96	22	90	31	202	8	33	47	298	30	123	
00	22		22		33		10		55		32		
.5	22		30		28		4		50		34		
0	19		16		29		4		48		20		
5	16	79	20	88	40	130	6	24	56	209	26	112	
0	30		7		39		13		69		20		
5	22		12		37		3		59		15		
0	28		11		33		5		61		16		
5	20	100	8	38	16	125	3	24	36	225	11	62	
0	22		3		17		3		39		6		
5	21		2		11		0		32		2		
0	25		7		40		1		65		8		
5	29	97	9	21	35	103	1	5	64	200	10	26	
ls	586		1239		862		931		1448		2170		
totals		1825				1793				3618			
	40.4%		57.1%		59.5%		42.9%						
Hour	07:45		04:45		07:45		03:45		07:45		04:30		
e	115		178		221		159		336		309		
.	.82		.89		.87		.76		.93		.91		

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

ther :
eet name :US 460 BETWEEN VANSANT AND OAKWOOD
in <------ EB ------><------ WB ------><------Combined ------>

Site Code : T-8
Start Date: 08/19/97
File I.D. : T8_F1
Page : 1

Tuesday

Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
19	11		100		11		92		22		192	
15	11		112		8		78		19		190	
30	13		87		10		88		23		175	
2:45	9	44	105	404	6	35	89	347	15	79	194	751
00	5		66		7		92		12		158	
15	7		83		8		115		15		198	
1:30	8		61		7		91		15		152	
45	8	28	89	299	6	28	89	387	14	56	178	686
00	4		107		4		108		8		215	
2:15	4		84		2		91		6		175	
2:30	4		91		3		120		7		211	
45	4	16	71	353	2	11	114	433	6	27	185	786
00	2		106		1		97		3		203	
3:15	12		72		2		98		14		170	
30	2		82		4		110		6		192	
45	3	19	100	360	4	11	87	392	7	30	187	752
4:00	4		100		7		104		11		204	
4:15	6		112		3		100		9		212	
30	9		115		8		88		17		203	
45	15	34	125	452	6	24	116	408	21	58	241	860
5:00	25		112		10		95		35		207	
15	15		99		17		98		32		197	
30	21		83		24		89		45		172	
5:45	15	76	85	379	18	69	68	350	33	145	153	729
00	47		69		16		80		63		149	
15	46		64		40		83		86		147	
6:30	65		53		42		76		107		129	
45	60	218	39	225	54	152	70	309	114	370	109	534
00	50		52		48		37		98		89	
15	42		35		62		53		104		88	
30	64		46		86		47		150		93	
45	67	223	46	179	78	274	49	186	145	497	95	365
00	80		43		79		36		159		79	
15	64		32		96		37		160		69	
30	60		30		85		31		145		61	
45	84	288	32	137	86	346	27	131	170	634	59	268
00	78		33		66		24		144		57	
15	82		23		70		33		152		56	
30	70		16		65		21		135		37	
45	97	327	24	96	66	267	35	113	163	594	59	209
00	71		17		72		30		143		47	
15	76		16		73		25		149		41	
30	76		32		84		15		160		47	
45	82	305	10	75	71	300	26	96	153	605	36	171
00	88		9		121		22		209		31	
15	61		14		90		27		151		41	
30	84		6		93		21		177		27	
45	83	316	10	39	102	406	15	85	185	722	25	124
ls	1894		2998		1923		3237		3817		6235	
Totals		4892				5160				10052		
t %	49.6%		48.0%		50.3%		51.9%					

Hour	09:00	04:15	11:00	02:00	11:00	04:15
me	327	464	406	433	722	863
F.	.84	.92	.83	.90	.86	.89

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-8
Start Date: 08/19/97
File I.D. : T8_F1
Page : 2

ther :

eet name :US 460 BETWEEN VANSANT AND OAKWOOD

E/W

in	<------ EB ------>				<------ WB ------>				<------Combined ------>				Wednesday
ime	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
-00 08/20	11		103		8		88		19		191		
15	15		87		13		99		28		186		
2:30	14		100		12		71		26		171		
2:45	4	44	90	380	9	42	77	335	13	86	167	715	
00	6		95		10		82		16		177		
..15	11		104		13		66		24		170		
1:30	9		89		5		106		14		195		
:45	6	32	79	367	6	34	78	332	12	66	157	699	
:00	2		83		6		85		8		168		
2:15	6		86		2		100		8		186		
2:30	5		88		1		86		6		174		
:45	3	16	95	352	8	17	109	380	11	33	204	732	
3:00	1		94		4		98		5		192		
3:15	6		101		2		96		8		197		
:30	4		91		8		106		12		197		
:45	3	14	102	388	1	15	90	390	4	29	192	778	
4:00	5		73		4		87		9		160		
:15	5		113		6		87		11		200		
:30	13		113		4		96		17		209		
4:45	11	34	88	387	16	30	85	355	27	64	173	742	
5:00	19		98		4		93		23		191		
:15	18		91		23		76		41		167		
:30	15		68		14		80		29		148		
5:45	19	71	57	314	22	63	83	332	41	134	140	646	
:00	46		68		32		71		78		139		
:1	49		60		37		62		86		122		
6:30	59		64		46		59		105		123		
6:45	62	216	54	246	44	159	51	243	106	375	105	489	
7:00	57		50		71		53		128		103		
7:15	51		46		70		40		121		86		
:30	51		31		83		45		134		76		
:45	68	227	53	180	73	297	47	185	141	524	100	365	
:00	63		40		69		39		132		79		
:15	61		22		73		35		134		57		
:30	71		32		80		50		151		82		
:45	68	263	34	128	76	298	35	159	144	561	69	287	
:00	96		29		53		33		149		62		
:15	75		27		64		32		139		59		
:30	85		26		57		35		142		61		
45	63	319	20	102	70	244	33	133	133	563	53	235	
00	89		35		94		20		183		55		
15	76		31		68		12		144		43		
30	76		27		81		23		157		50		
45	71	312	13	106	85	328	28	83	156	640	41	189	
00	80		13		90		28		170		41		
15	99		16		107		26		206		42		
30	99		10		78		16		177		26		
45	91	369	18	57	87	362	16	86	178	731	34	143	
ils	1917		3007		1889		3013		3806		6020		
Totals		4924				4902				9826			
	50.3%		49.9%		49.6%		50.0%						
Hour	11:00		04:15		10:30		02:45		11:00		02:45		
me	369		412		363		409		731		790		
F.	.93		.91		.84		.93		.88		.96		

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-9
Start Date: 08/17/97
File I.D. : T9_F1
Page : 1

ber :

eet name :VA 83 @ BUCHANAN GENERAL HOSPITAL (West Access) N/S

	<------ SB (In) ------>				<------ NB (out) ------>				<------Combined ------>				Sunday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
:00	0		5		2		2		2		7		
5	2		13		3		4		5		17		
0	2		15		2		6		4		21		
:45	3	7	8	41	7	14	6	18	10	21	14	59	
0	2		5		2		6		4		11		
5	0		5		1		7		1		12		
:30	1		6		5		4		6		10		
:45	2	5	6	22	2	10	7	24	4	15	13	46	
0	0		10		0		7		0		17		
.5	0		12		4		7		4		19		
:30	2		15		2		12		4		27		
15	1	3	3	40	1	7	5	31	2	10	8	71	
0	0		5		0		6		0		11		
:15	1		10		1		9		2		19		
:30	2		10		0		6		2		16		
15	1	4	8	33	1	2	8	29	2	6	16	62	
.00	3		2		1		11		4		13		
:15	0		6		0		6		0		12		
30	1		9		0		2		1		11		
15	0	4	6	23	1	2	5	24	1	6	11	47	
00	0		7		2		6		2		13		
15	1		6		0		3		1		9		
30	0		3		1		4		1		7		
45	3	4	5	21	1	4	7	20	4	8	12	41	
00	3		9		0		12		3		21		
15	6		12		2		4		8		16		
30	5		19		2		11		7		30		
45	5	19	7	47	2	6	5	32	7	25	12	79	
00	0		6		2		13		2		19		
15	2		4		6		10		8		14		
30	8		8		10		7		18		15		
15	2	12	3	21	3	21	9	39	5	33	12	60	
0	4		3		2		2		6		5		
:5	4		6		6		11		10		17		
0	4		3		1		4		5		7		
5	3	15	6	18	3	12	2	19	6	27	8	37	
0	3		2		1		5		4		7		
5	3		2		5		8		8		10		
0	2		3		4		18		6		21		
5	2	10	2	9	2	12	2	33	4	22	4	42	
0	3		2		4		2		7		4		
5	4		1		2		2		6		3		
0	3		1		2		1		5		2		
5	2	12	1	5	6	14	1	6	8	26	2	11	
0	4		0		3		0		7		0		
5	6		5		4		1		10		6		
0	10		0		5		2		15		2		
5	4	24	1	6	6	18	5	8	10	42	6	14	
s	119		286		122		283		241		569		
otals		405				405				810			
	49.3%		50.2%		50.6%		49.7%						
Hour	11:00		06:00		07:00		06:30		11:00		05:45		
e	24		47		21		39		42		79		
.	.6		.61		.52		.75		.7		.65		

ASSOC., INC.

CORE FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-9
Start Date: 08/17/97
File I.D. : T9_F1
Page : 2

Other :

Street Name : VA 83 @ BUCHANAN GENERAL HOSPITAL (West Access) N/S

Begin <------SB (In) ------><------ NB (Out) ------><------Combined ------> Monday

Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
12:00/18	1		11		4		14		5		25	
:15	1		11		4		12		5		23	
:30	0		12		0		8		0		20	
12:45	0	2	12	46	1	9	10	44	1	11	22	90
:00	0		7		0		13		0		20	
:15	0		13		0		7		0		20	
01:30	0		6		1		9		1		15	
:45	0	*	8	34	0	1	5	34	0	1	13	68
:00	0		12		0		12		0		24	
02:15	0		15		0		17		0		32	
02:30	1		7		0		5		1		12	
:45	1	2	7	41	0	*	19	53	1	2	26	94
:00	1		11		1		8		2		19	
03:15	0		8		2		15		2		23	
:30	0		13		0		12		0		25	
:45	1	2	5	37	1	4	15	50	2	6	20	87
04:00	0		11		0		15		0		26	
04:15	2		5		2		8		4		13	
:30	0		7		0		19		0		26	
:45	0	2	9	32	0	2	10	52	0	4	19	84
05:00	1		13		0		18		1		31	
:15	2		3		0		17		2		20	
:30	0		11		2		14		2		25	
05:45	2	5	7	34	2	4	3	52	4	9	10	86
:00	1		7		0		6		1		13	
:15	8		8		0		3		8		11	
06:30	17		20		2		4		19		24	
06:45	12	38	11	46	3	5	5	18	15	43	16	64
07:00	8		8		5		6		13		14	
07:15	7		2		8		13		15		15	
07:30	6		4		9		18		15		22	
07:45	16	37	7	21	6	28	6	43	22	65	13	64
08:00	15		8		7		10		22		18	
08:15	18		7		5		5		23		12	
08:30	12		0		9		3		21		3	
08:45	18	63	1	16	6	27	1	19	24	90	2	35
:00	15		1		6		8		21		9	
:15	14		3		6		2		20		5	
:30	14		3		6		10		20		13	
:45	16	59	2	9	10	28	1	21	26	87	3	30
:00	16		3		10		4		26		7	
:15	19		1		12		3		31		4	
:30	11		3		9		1		20		4	
:45	13	59	1	8	23	54	1	9	36	113	2	17
:00	15		1		20		3		35		4	
:15	15		2		20		4		35		6	
:30	16		1		14		5		30		6	
:45	8	54	4	8	13	67	7	19	21	121	11	27
Totals	323		332		229		414		552		746	
		655				643				1298		
%	58.5%		44.5%		41.4%		55.5%					
Peak Hour	09:30		06:15		10:45		04:30		10:45		04:30	
Volume	65		47		77		64		136		96	
P.H.F.	.85		.58		.83		.84		.94		.77	

ASSOC., INC.

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

ther :

Site Code : T-9
Start Date: 08/17/97
File I.D. : T9_F1
Page : 3

eet name :VA 83 @ BUCHANAN GENERAL HOSPITAL (West Access) N/S

in <------ SB (In) ------><------ NB (Out) ------><------Combined ------> Tuesday

ine	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
:00 /19	1		4		4		16		5		20	
15	2		14		4		12		6		26	
2:30	0		9		2		21		2		30	
2:45	0	3	16	43	1	11	12	61	1	14	28	104
00	2		10		0		15		2		25	
15	0		9		0		12		0		21	
1:30	0		13		0		9		0		22	
:45	0	2	10	42	2	2	5	41	2	4	15	83
:00	0		9		0		16		0		25	
2:15	0		17		0		12		0		29	
2:30	0		7		0		10		0		17	
:45	0	*	16	49	0	*	11	49	0	*	27	98
:00	3		18		0		14		3		32	
3:15	0		10		0		18		0		28	
:30	0		9		1		12		1		21	
:45	0	3	11	48	0	1	9	53	0	4	20	101
4:00	0		7		0		19		0		26	
:15	0		6		1		15		1		21	
:30	1		11		1		22		2		33	
:45	1	2	7	31	1	3	18	74	2	5	25	105
5:00	0		10		0		19		0		29	
:15	2		18		2		8		4		26	
:30	1		9		0		11		1		20	
5:45	5	8	7	44	2	4	8	46	7	12	15	90
:00	1		16		1		7		2		23	
:	9		12		1		6		10		18	
6:30	15		12		3		7		18		19	
6:45	16	41	3	43	1	6	7	27	17	47	10	70
:00	11		5		3		8		14		13	
:15	13		7		8		14		21		21	
7:30	7		10		10		13		17		23	
:45	18	49	3	25	6	27	7	42	24	76	10	67
:00	13		5		7		8		20		13	
8:15	16		3		3		10		19		13	
8:30	23		3		5		12		28		15	
8:45	16	68	0	11	7	22	0	30	23	90	0	41
:00	16		0		5		6		21		6	
:15	7		2		11		2		18		4	
:30	14		0		5		0		19		0	
:45	24	61	1	3	8	29	2	10	32	90	3	13
:00	16		1		13		3		29		4	
:15	11		0		12		1		23		1	
:30	17		0		9		1		26		1	
:45	12	56	1	2	8	42	1	6	20	98	2	8
:00	11		4		19		0		30		4	
:15	11		0		14		0		25		0	
:30	10		1		13		0		23		1	
:45	14	46	5	10	16	62	4	4	30	108	9	14
als	339		351		209		443		548		794	
Totals		690				652				1342		
%	61.8%		44.2%		38.1%		55.7%					

k Hour	08:15	02:15	11:00	04:00	09:45	04:30
ume	71	58	62	74	110	113
.F.	.77	.80	.81	.84	.85	.85

I ASSOC., INC.
7

Other :

COAL FIELDS EXPRESSWAY
TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-9
Start Date: 08/17/97
File I.D. : T9_F1
Page : 4

Street name :VA 83 @ BUCHANAN GENERAL HOSPITAL (West Access) N/S

gin <------ SB (In) ------><------ NB (Out) ------><------Combined ------> Wednesday

Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
12:0/20	1		14		2		13		3		27	
12:15	0		12		3		14		3		26	
12:30	0		14		4		14		4		28	
12:45	0	1	12	52	0	9	12	53	0	10	24	105
1:00	0		13		0		15		0		28	
1:15	1		14		1		7		2		21	
01:30	1		12		1		12		2		24	
01:45	0	2	16	55	0	2	13	47	0	4	29	102
2:00	1		17		1		14		2		31	
02:15	0		6		1		17		1		23	
02:30	0		11		0		10		0		21	
2:45	0	1	7	41	0	2	12	53	0	3	19	94
3:00	1		17		0		21		1		38	
03:15	0		21		0		26		0		47	
03:30	1		10		0		19		1		29	
3:45	0	2	10	58	1	1	14	80	1	3	24	138
04:00	0		10		0		18		0		28	
04:15	1		12		1		13		2		25	
4:30	1		14		3		30		4		44	
4:45	0	2	9	45	0	4	10	71	0	6	19	116
05:00	1		4		0		13		1		17	
05:15	0		15		0		10		0		25	
5:30	1		9		0		7		1		16	
05:45	3	5	8	36	1	1	6	36	4	6	14	72
06:00	2		16		1		10		3		26	
6:	9		13		1		11		10		24	
6:	11		9		0		16		11		25	
6:45	15	37	6	44	1	3	11	48	16	40	17	92
07:00	7		11		2		4		9		15	
07:15	12		4		8		9		20		13	
07:30	5		6		5		13		10		19	
7:45	15	39	4	25	8	23	9	35	23	62	13	60
8:00	13		6		7		4		20		10	
8:15	17		4		12		8		29		12	
8:30	16		2		5		13		21		15	
8:45	13	59	5	17	3	27	4	29	16	86	9	46
9:00	20		3		7		6		27		9	
9:15	11		6		6		2		17		8	
9:30	9		1		2		5		11		6	
9:45	13	53	5	15	6	21	4	17	19	74	9	32
0:00	12		3		14		5		26		8	
0:15	12		0		9		7		21		7	
0:30	13		1		8		1		21		2	
0:45	12	49	0	4	4	35	1	14	16	84	1	18
1:00	10		2		20		2		30		4	
1:15	11		2		7		0		18		2	
1:30	8		2		12		3		20		5	
1:45	13	42	3	9	11	50	5	10	24	92	8	19
tals	292		401		178		493		470		894	
y Totals		693				671				1364		
lit %	62.1%		44.8%		37.8%		55.1%					

ak Hour	08:15	01:15	11:00	03:00	07:45	03:00
lume	66	59	50	80	93	138
H.F.	.82	.86	.62	.76	.80	.73

TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

Site Code : T-10
Start Date: 08/17/97
File I.D. : T10_F1
Page : 1

eet Name :VA 83 @ BUCHANAN GENERAL HOSPITAL (East Access) N/S

Sunday

	<------ NB (Out) ------>				<------ SB (In) ------>				<------ Combined ------>			
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
00	0		4		4		7		4		11	
15	0		5		4		10		4		15	
)	0		8		1		4		1		12	
45	0	*	9	26	1	10	13	34	1	10	22	60
00	0		5		0		5		0		10	
5	1		8		0		6		1		14	
0	0		15		1		8		1		23	
:45	0	1	17	45	0	1	16	35	0	2	33	80
0	0		5		0		4		0		9	
5	0		3		0		5		0		8	
:30	2		8		0		7		2		15	
:45	0	2	12	28	0	*	10	26	0	2	22	54
0	0		7		0		6		0		13	
:15	0		8		0		8		0		16	
:30	0		11		1		8		1		19	
5	1	1	2	28	1	2	6	28	2	3	8	56
0	0		8		0		4		0		12	
:15	0		7		2		9		2		16	
0	0		14		2		5		2		19	
15	0	*	15	44	1	5	13	31	1	5	28	75
:00	0		15		0		3		0		18	
:15	0		10		0		4		0		14	
30	0		6		0		7		0		13	
.45	0	*	7	38	0	*	8	22	0	*	15	60
:00	0		12		2		3		2		15	
15	0		7		0		12		0		19	
30	0		7		10		7		10		14	
:45	2	2	11	37	2	14	7	29	4	16	18	66
00	1		6		4		8		5		14	
15	0		7		2		9		2		16	
:30	4		11		4		6		8		17	
:45	2	7	11	35	3	13	4	27	5	20	15	62
00	2		5		3		2		5		7	
15	1		3		2		4		3		7	
30	1		4		1		6		2		10	
45	5	9	2	14	0	6	3	15	5	15	5	29
00	1		2		1		5		2		7	
15	1		3		3		3		4		6	
30	2		4		3		0		5		4	
45	1	5	3	12	2	9	2	10	3	14	5	22
00	4		0		5		2		9		2	
15	7		0		2		2		9		2	
30	4		0		3		2		7		2	
45	11	26	0	*	3	13	1	7	14	39	1	7
00	4		1		1		1		5		2	
15	2		2		3		0		5		2	
30	0		0		5		1		5		1	
15	2	8	2	5	7	16	1	3	9	24	3	8
ls	61		312		89		267		150		579	
Totals		373				356				729		
t %	40.6%		53.8%		59.3%		46.1%					
our	10:00		04:30		06:30		01:00		10:00		04:15	
me	26		54		18		35		39		81	
F.	.59		.9		.45		.54		.69		.72	

TRAFFIC VOLUME COUNTS
CHI ASSOCIATES, INC.

er :
treet name :VA 83 @ BUCHANAN GENERAL HOSPITAL (East Access) N/S
eain <------ NB (Out) ------><------ SB (In) ------><------Combined ------>

Site Code : T-10
Start Date: 08/17/97
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e	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Monday
..00 08/18	0		14		1		15		1		29		
2:15	0		17		0		7		0		24		
30	0		11		0		14		0		25		
45	0	*	12	54	0	1	15	51	0	1	27	105	
1:00	0		13		0		10		0		23		
1:15	0		5		0		17		0		22		
30	0		16		0		10		0		26		
1:45	0	*	17	51	0	*	14	51	0	*	31	102	
2:00	0		8		1		13		1		21		
15	0		15		0		16		0		31		
30	0		14		0		22		0		36		
2:45	0	*	15	52	1	2	15	66	1	2	30	118	
3:00	2		12		0		25		2		37		
15	0		78		0		25		0		103		
3:30	0		46		0		24		0		70		
3:45	0	2	18	154	0	*	15	89	0	2	33	243	
00	1		27		0		16		1		43		
..15	0		29		2		17		2		46		
4:30	2		27		2		22		4		49		
45	0	3	15	98	3	7	35	90	3	10	50	188	
00	0		39		0		23		0		62		
5:15	2		25		5		24		7		49		
5:30	1		24		6		11		7		35		
45	1	4	14	102	6	17	12	70	7	21	26	172	
6:00	1		12		3		9		4		21		
6:15	3		16		11		17		14		33		
:30	6		13		12		11		18		24		
:45	8	18	11	52	7	33	13	50	15	51	24	102	
:00	2		11		9		17		11		28		
:15	9		22		21		28		30		50		
:30	24		56		45		10		69		66		
:45	38	73	23	112	103	178	15	70	141	251	38	182	
:00	52		10		131		6		183		16		
:15	31		4		57		9		88		13		
:30	6		9		24		9		30		18		
:45	10	99	11	34	12	224	11	35	22	323	22	69	
00	9		4		12		7		21		11		
15	12		24		6		7		18		31		
30	8		8		10		4		18		12		
45	20	49	5	41	14	42	4	22	34	91	9	63	
00	9		3		13		1		22		4		
15	7		2		10		2		17		4		
30	9		2		17		0		26		2		
45	8	33	0	7	7	47	1	4	15	80	1	11	
00	6		1		6		0		12		1		
15	7		2		8		0		15		2		
30	25		1		16		4		41		5		
45	16	54	4	8	13	43	0	4	29	97	4	12	
ls	335		765		594		602		929		1367		
Totals		1100				1196				2296			
t %	36.0%		55.9%		63.9%		44.0%						
r	07:30		03:15		07:30		04:30		07:30		03:15		
	145		169		336		104		481		249		
.	.69		.54		.64		.74		.65		.60		

CHI ASSOCIATES, INC.

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eet name :VA 83 @ BUCHANAN GENERAL HOSPITAL (East Access) N/S

in	<------ NB (Out) ------>				<------ SB (In) ------>				<------Combined ------>				Tuesday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
08/19	2		22		0		15		2		37		
15	0		13		0		16		0		29		
	0		7		0		9		0		16		
	0	2	7	49	0	*	11	51	0	2	18	100	
00	3		9		1		10		4		19		
15	0		7		0		8		0		15		
	0		13		0		14		0		27		
	0	3	22	51	0	1	13	45	0	4	35	96	
00	0		17		1		12		1		29		
	0		13		0		19		0		32		
	0		12		0		14		0		26		
45	0	*	14	56	0	1	28	73	0	1	42	129	
	0		14		0		24		0		38		
	1		69		1		22		2		91		
30	0		46		0		19		0		65		
45	1	2	25	154	0	1	21	86	1	3	46	240	
	1		27		0		12		1		39		
	0		24		1		12		1		36		
30	0		19		3		18		3		37		
	0	1	7	77	1	5	18	60	1	6	25	137	
	1		25		0		29		1		54		
15	1		28		5		25		6		53		
30	2		20		6		22		8		42		
	0	4	22	95	6	17	31	107	6	21	53	202	
00	1		28		5		39		6		67		
15	4		24		8		24		12		48		
0	6		15		13		28		19		43		
5	7	18	29	96	6	32	23	114	13	50	52	210	
00	5		25		9		18		14		43		
5	10		20		22		15		32		35		
0	15		23		49		6		64		29		
5	32	62	19	87	94	174	5	44	126	236	24	131	
0	32		26		107		9		139		35		
5	25		43		63		9		88		52		
0	12		20		16		8		28		28		
5	7	76	11	100	10	196	6	32	17	272	17	132	
0	8		7		9		3		17		10		
5	4		0		5		1		9		1		
0	6		7		9		3		15		10		
5	5	23	5	19	12	35	3	10	17	58	8	29	
0	12		2		11		4		23		6		
5	6		2		11		2		17		4		
	8		2		6		4		14		6		
	10	36	3	9	7	35	1	11	17	71	4	20	
	7		2		8		2		15		4		
	4		1		20		1		24		2		
	47		1		15		3		62		4		
	19	77	4	8	14	57	1	7	33	134	5	15	
	304		801		554		640		858		1441		
otals		1105				1194				2299			
%	35.4%		55.5%		64.5%		44.4%						
	07:30		03:15		07:30		05:45		07:30		03:15		
	104		167		313		122		417		241		
	.81		.60		.73		.78		.75		.66		

t name :VA 83 @ BUCHANAN GENERAL HOSPITAL (East Access) N/S

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File I.D. : T10_F1
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In	<------ NB (Out) ------>				<------ SB (In) ------>				<------Combined ------>				Wednesday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
08/20	0		12		1		26		1		38		
15	0		18		0		15		0		33		
30	3		8		0		10		3		18		
	0	3	7	45	0	1	11	62	0	4	18	107	
	0		13		0		6		0		19		
15	0		8		0		11		0		19		
	0		18		0		15		0		33		
	0	*	17	56	0	*	14	46	0	*	31	102	
00	0		11		0		10		0		21		
15	0		11		0		14		0		25		
	0		9		0		11		0		20		
45	0	*	11	42	0	*	24	59	0	*	35	101	
00	0		15		0		37		0		52		
5	0		82		0		34		0		116		
0	0		27		0		13		0		40		
:45	0	*	23	147	0	*	9	93	0	*	32	240	
0	1		23		0		13		1		36		
5	0		19		2		13		2		32		
:30	1		19		2		17		3		36		
:45	0	2	15	76	1	5	29	72	1	7	44	148	
0	0		41		1		24		1		65		
5	0		14		3		23		3		37		
:30	1		16		4		12		5		28		
5	0	1	18	89	6	14	12	71	6	15	30	160	
0	1		8		2		13		3		21		
:15	1		14		11		13		12		27		
30	6		34		7		19		13		53		
15	6	14	28	84	7	27	11	56	13	41	39	140	
00	10		30		10		16		20		46		
15	3		15		19		15		22		30		
30	14		15		40		10		54		25		
45	25	52	14	74	84	153	6	47	109	205	20	121	
00	34		13		107		9		141		22		
15	36		2		81		9		117		11		
30	5		9		17		11		22		20		
45	14	89	5	29	16	221	11	40	30	310	16	69	
00	3		23		4		6		7		29		
15	4		8		2		9		6		17		
30	7		1		7		2		14		3		
45	6	20	7	39	10	23	2	19	16	43	9	58	
00	9		1		10		5		19		6		
15	8		3		9		0		17		3		
30	8		5		13		2		21		7		
15	4	29	1	10	8	40	1	8	12	69	2	18	
00	17		2		13		3		30		5		
.5	10		0		19		0		29		0		
0	30		1		14		4		44		5		
5	18	75	4	7	14	60	2	9	32	135	6	16	
ls.	285		698		544		582		829		1280		
Totals		983				1126				2109			
t %	34.3%		54.5%		65.6%		45.4%						
Hour	07:30		03:15		07:30		02:45		07:30		02:45		
	109		155		312		108		421		243		
.	.75		.47		.72		.72		.74		.52		

r :

CHI ASSOCIATES, INC.

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File I.D. : T11_F1

ss TO BUCHANAN INFORMATION PARK (ON VA 83) N/S

gin <------ SB (out) ------><------ NB (In) ------><------Combined ------>

Sunday

	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
0 08/17	0		2		0		1		0		3	
:15	0		0		0		0		0		0	
30	1		0		0		1		1		1	
15	3	4	0	2	1	1	0	2	4	5	0	4
:00	0		4		0		0		0		4	
:15	0		2		0		1		0		3	
30	1		4		0		1		1		5	
15	0	1	0	10	0	*	3	5	0	1	3	15
:00	0		1		0		3		0		4	
15	0		1		0		0		0		1	
30	4		2		0		1		4		3	
:45	0	4	0	4	0	*	0	4	0	4	0	8
:00	0		5		0		1		0		6	
15	0		0		0		0		0		0	
:30	0		0		0		2		0		2	
3:45	0	*	2	7	0	*	2	5	0	*	4	12
00	0		3		0		0		0		3	
15	0		0		2		0		2		0	
4:30	3		0		1		0		4		0	
45	0	3	0	3	1	4	0	*	1	7	0	3
00	0		5		0		0		0		5	
5:15	0		0		0		1		0		1	
5:30	0		0		1		0		1		0	
45	0	*	1	6	1	2	0	1	1	2	1	7
.00	0		4		0		0		0		4	
5:15	0		3		0		3		0		6	
30	0		0		0		0		0		0	
4	0	*	2	9	0	*	2	5	0	*	4	14
:00	1		1		0		0		1		1	
:15	0		0		1		0		1		0	
:30	1		0		0		1		1		1	
:45	0	2	2	3	1	2	2	3	1	4	4	6
:00	0		1		3		0		3		1	
:15	2		1		1		1		3		2	
:30	0		1		0		0		0		1	
:45	1	3	0	3	2	6	1	2	3	9	1	5
:00	0		2		6		1		6		3	
:15	0		5		0		2		0		7	
:30	0		3		0		0		0		3	
45	0	*	1	11	1	7	0	3	1	7	1	14
00	0		3		2		1		2		4	
15	0		0		1		0		1		0	
30	0		0		0		0		0		0	
45	0	*	1	4	1	4	0	1	1	4	1	5
00	2		3		0		0		2		3	
15	0		0		1		0		1		0	
30	0		1		0		1		0		2	
15	0	2	1	5	0	1	1	2	0	3	2	7
als	19		67		27		33		46		100	
Totals		86				60				146		
t %	41.3%		67.0%		58.7%		33.0%					
ur	00:00		09:15		08:15		01:15		08:15		01:00	
e	4		12		9		8		12		15	
F.	.33		.6		.37		.66		.5		.75	

er :

CHI ASSOCIATES, INC.

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ccess TO BUCHANAN INFO. PARK M/S

gin <------ SB (out) ------><------ NB (In) ------><------Combined ------> Monday

e	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
00 08/18	0		2		0		1		0		3	
:15	0		3		0		0		0		3	
:30	0		1		0		1		0		2	
45	0	*	1	7	0	*	0	2	0	*	1	9
:00	2		3		0		2		2		5	
:15	0		1		0		3		0		4	
30	0		1		0		4		0		5	
:45	0	2	5	10	0	*	2	11	0	2	7	21
:00	3		2		0		7		3		9	
15	0		4		0		4		0		8	
30	0		4		0		2		0		6	
:45	0	3	2	12	0	*	4	17	0	3	6	29
:00	0		1		0		3		0		4	
15	0		2		0		4		0		6	
:30	0		3		0		9		0		12	
3:45	0	*	3	9	0	*	4	20	0	*	7	29
00	0		6		0		3		0		9	
15	0		1		0		1		0		2	
4:30	0		1		0		4		0		5	
:45	0	*	0	8	0	*	4	12	0	*	4	20
:00	0		13		0		0		0		13	
5:15	0		2		1		1		1		3	
5:30	1		0		6		5		7		5	
:45	1	2	8	23	1	8	9	15	2	10	17	38
:00	0		6		0		2		0		8	
6:15	0		2		0		8		0		10	
:30	0		5		0		4		0		9	
:	0	*	2	15	0	*	6	20	0	*	8	35
7:00	0		8		1		0		1		8	
7:15	3		2		7		0		10		2	
:30	0		0		1		0		1		0	
:45	0	3	2	12	2	11	2	2	2	14	4	14
:00	6		1		11		2		17		3	
:15	3		10		2		6		5		16	
:30	1		3		7		1		8		4	
:45	0	10	6	20	4	24	3	12	4	34	9	32
:00	1		8		4		0		5		8	
:15	1		2		5		2		6		4	
:30	0		1		0		0		0		1	
:45	0	2	1	12	1	10	0	2	1	12	1	14
:00	0		3		5		0		5		3	
:15	2		2		4		0		6		2	
:30	0		0		0		1		0		1	
:45	0	2	2	7	0	9	0	1	0	11	2	8
00	0		10		0		0		0		10	
15	1		4		1		0		2		4	
30	0		4		0		0		0		4	
45	1	2	1	19	3	4	0	*	4	6	1	19
als	26		154		66		114		92		268	
Totals		180				180				360		
lt %	28.2%		57.4%		71.7%		42.5%					

ur	07:45	08:15	08:00	05:30	08:00	05:45
ne	10	27	24	24	34	44
F.	.41	.67	.54	.66	.5	.64

CHI ASSOCIATES, INC.

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ccess to Buchanan Info. Park N/S

gin	<------ SB(out) ------>				<------ NB (In) ------>				<------Combined ------>				Tuesday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
0 08/19	0		4		0		4		0		8		
:15	2		2		1		3		3		5		
:30	3		7		0		1		3		8		
5	1	6	2	15	0	1	1	9	1	7	3	24	
..0	1		5		0		1		1		6		
:15	2		2		0		1		2		3		
0	0		3		0		1		0		4		
5	0	3	4	14	0	*	5	8	0	3	9	22	
:00	0		1		0		5		0		6		
:15	0		5		0		3		0		8		
0	0		7		0		6		0		13		
:45	0	*	1	14	0	*	5	19	0	*	6	33	
:00	0		5		0		3		0		8		
5	0		1		0		3		0		4		
0	0		3		0		6		0		9		
:45	0	*	3	12	0	*	2	14	0	*	5	26	
:00	0		8		0		2		0		10		
5	0		5		0		1		0		6		
:30	0		1		0		2		0		3		
:45	0	*	2	16	0	*	5	10	0	*	7	26	
0	0		11		0		0		0		11		
5	0		4		2		4		2		8		
:30	0		4		0		4		0		8		
15	0	*	1	20	1	3	4	12	1	3	5	32	
0	0		16		0		2		0		18		
:15	0		11		1		0		1		11		
:30	0		3		0		3		0		6		
	0	*	1	31	0	1	2	7	0	1	3	38	
:00	0		6		4		1		4		7		
:15	1		1		2		1		3		2		
30	0		0		1		1		1		1		
15	0	1	3	10	1	8	2	5	1	9	5	15	
:00	1		2		6		0		7		2		
15	2		0		6		4		8		4		
30	0		6		9		1		9		7		
:45	1	4	1	9	8	29	0	5	9	33	1	14	
:00	2		0		5		0		7		0		
15	1		1		4		1		5		2		
.30	0		1		5		0		5		1		
:45	0	3	2	4	8	22	0	1	8	25	2	5	
00	0		6		4		2		4		8		
15	2		4		6		1		8		5		
30	0		5		0		0		0		5		
45	1	3	3	18	2	12	1	4	3	15	4	22	
00	1		3		0		0		1		3		
15	1		1		4		0		5		1		
30	3		4		10		0		13		4		
15	3	8	0	8	5	19	0	*	8	27	0	8	
ils	28		171		95		94		123		265		
Totals		199				189				388			
t %	22.7%		64.5%		77.2%		35.4%						
ur	11:00		05:30		08:00		01:45		08:00		05:30		
	8		32		29		19		33		42		
F.	.66		.5		.80		.79		.91		.58		

r :

CHI ASSOCIATES, INC.

Start Date: 08/17/97
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CCESS TO BUCHANAN INFO. PARK

M/S

gin <------ SB(out) ------><------ NB(IN) ------><------Combined ------> Wednesday

	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
0 08/20	1		3		0		4		1		7	
:15	4		2		0		0		4		2	
0	3		1		1		2		4		3	
5	1	9	1	7	0	1	1	7	1	10	2	14
:00	0		6		0		2		0		8	
:15	0		1		0		2		0		3	
0	0		3		0		1		0		4	
5	0	*	2	12	0	*	0	5	0	*	2	17
:00	0		2		0		6		0		8	
5	0		0		0		1		0		1	
0	0		5		0		0		0		5	
:45	0	*	1	8	0	*	5	12	0	*	6	20
:00	0		2		0		2		0		4	
5	0		1		0		2		0		3	
0	0		3		0		9		0		12	
:45	0	*	0	6	0	*	3	16	0	*	3	22
00	0		10		0		1		0		11	
5	0		1		0		1		0		2	
:30	0		2		0		4		0		6	
:45	0	*	4	17	0	*	7	13	0	*	11	30
00	0		12		0		1		0		13	
.15	2		3		1		2		3		5	
:30	0		4		2		3		2		7	
45	0	2	3	22	2	5	3	9	2	7	6	31
00	0		10		0		1		0		11	
:15	0		11		0		6		0		17	
:30	0		6		0		7		0		13	
	0	*	4	31	1	1	4	18	1	1	8	49
:00	0		6		0		1		0		7	
:15	0		0		5		1		5		1	
30	0		0		1		0		1		0	
45	1	1	1	7	1	7	4	6	2	8	5	13
:00	2		4		4		0		6		4	
15	3		0		17		0		20		0	
30	5		1		17		0		22		1	
:45	4	14	0	5	6	44	1	1	10	58	1	6
:00	1		1		9		0		10		1	
:15	4		4		2		2		6		6	
:30	1		4		3		3		4		7	
:45	0	6	4	13	6	20	0	5	6	26	4	18
00	0		7		2		0		2		7	
15	0		3		7		2		7		5	
30	0		3		0		1		0		4	
45	2	2	1	14	1	10	0	3	3	12	1	17
00	0		4		0		0		0		4	
15	1		1		0		0		1		1	
30	0		4		1		0		1		4	
45	3	4	2	11	3	4	0	*	6	8	2	11
ils	38		153		92		95		130		248	
Totals		191				187				378		
t %	29.2%		61.6%		70.7%		38.3%					
our	08:00		06:00		08:15		02:45		08:15		06:00	
	14		31		49		18		62		49	
F.	.7		.70		.72		.5		.70		.72	

CHI ASSOCIATES, INC.

Start Date: 08/16/97
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er :
et name :ACCESS TO BREAKS INTERSTATE PARK
gin <------ EB (out) ------><------ WB (In) ------><------Combined ------> E/W Saturday

	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
00 08/16	2		3		0		18		2		21	
:15	0		12		0		22		0		34	
:3	0		4		1		32		1		36	
15	0	2	9	28	1	2	20	92	1	4	29	120
00	0		10		0		24		0		34	
1:15	0		13		0		29		0		42	
30	0		10		0		17		0		27	
45	0	*	15	48	0	*	20	90	0	*	35	138
2:00	0		12		0		25		0		37	
2:15	0		18		0		11		0		29	
30	0		19		0		13		0		32	
45	0	*	14	63	0	*	12	61	0	*	26	124
3:00	0		28		0		11		0		39	
15	0		14		0		8		0		22	
30	0		14		0		9		0		23	
3:45	0	*	20	76	0	*	15	43	0	*	35	119
00	0		24		0		9		0		33	
15	0		26		0		10		0		36	
4:30	0		16		0		7		0		23	
4:45	0	*	32	98	0	*	15	41	0	*	47	139
00	0		21		0		19		0		40	
15	0		19		0		18		0		37	
5:30	0		8		0		16		0		24	
45	0	*	15	63	0	*	25	78	0	*	40	141
00	0		13		1		24		1		37	
6:15	1		24		7		17		8		41	
30	2		13		0		30		2		43	
	0	3	8	58	2	10	29	100	2	13	37	158
7:00	1		17		4		18		5		35	
7:15	1		9		3		17		4		26	
30	3		10		5		7		8		17	
45	1	6	16	52	4	16	13	55	5	22	29	107
1:00	4		16		4		6		8		22	
15	5		24		4		3		9		27	
30	4		33		6		1		10		34	
45	9	22	39	112	3	17	4	14	12	39	43	126
00	6		61		3		5		9		66	
15	2		12		5		1		7		13	
30	5		6		3		4		8		10	
45	5	18	4	83	4	15	2	12	9	33	6	95
00	7		0		14		2		21		2	
15	8		7		9		1		17		8	
30	10		2		25		3		35		5	
45	8	33	2	11	12	60	2	8	20	93	4	19
00	3		3		20		0		23		3	
15	8		0		21		0		29		0	
30	3		0		23		1		26		1	
45	3	17	0	3	15	79	1	2	18	96	1	5
als	101		695		199		596		300		1291	
Totals		796				795				1591		
t %	33.6%		53.8%		66.3%		46.1%					

Hour	10:00	08:15	11:00	00:30	10:30	08:15
	33	157	79	105	107	170
F.	.82	.64	.85	.82	.76	.64

CHI ASSOCIATES, INC.

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eet name :ACCESS TO BREAKS INTERSTATE PARK
gin <------ EB(out) ------><------ WB(In) ------><------Combined ------> E/W

	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
0 08/17	4		11		1		33		5		44	
:15	0		8		2		26		2		34	
:30	0		8		0		53		0		61	
5	0	4	17	44	0	3	49	161	0	7	66	205
:00	0		14		0		47		0		61	
:15	0		12		0		41		0		53	
0	0		24		0		57		0		81	
5	0	*	33	83	0	*	31	176	0	*	64	259
:00	0		30		0		47		0		77	
:15	0		46		0		38		0		84	
0	0		35		0		34		0		69	
:45	0	*	34	145	0	*	37	156	0	*	71	301
:00	0		42		0		20		0		62	
5	0		52		0		23		0		75	
0	0		42		0		25		0		67	
:45	0	*	37	173	0	*	26	94	0	*	63	267
:00	0		64		0		26		0		90	
5	0		41		0		19		0		60	
:30	0		30		0		14		0		44	
:45	0	*	39	174	0	*	15	74	0	*	54	248
0	0		28		0		17		0		45	
:15	0		36		0		13		0		49	
:30	0		43		0		13		0		56	
15	0	*	51	158	1	1	12	55	1	1	63	213
00	0		96		2		10		2		106	
:15	1		31		6		1		7		32	
:30	1		6		0		2		1		8	
15	2	4	17	150	2	10	8	21	4	14	25	171
:00	1		14		9		3		10		17	
:15	0		6		3		1		3		7	
30	0		3		0		5		0		8	
45	2	3	5	28	4	16	6	15	6	19	11	43
00	3		11		2		3		5		14	
15	5		6		1		0		6		6	
30	17		3		7		1		24		4	
45	5	30	1	21	6	16	2	6	11	46	3	27
00	9		5		6		2		15		7	
15	6		2		5		2		11		4	
30	7		3		13		1		20		4	
15	7	29	1	11	6	30	0	5	13	59	1	16
0	4		0		13		2		17		2	
5	4		3		12		1		16		4	
0	7		1		19		1		26		2	
5	12	27	0	4	26	70	1	5	38	97	1	9
0	9		1		29		0		38		1	
5	6		0		26		0		32		0	
0	7		0		29		1		36		1	
5	13	35	0	1	33	117	1	2	46	152	1	3
ls	132		992		263		770		395		1762	
Totals		1124				1033				2157		
%	33.4%		56.3%		66.5%		43.7%					

Hour	08:30	05:15	11:00	00:45	11:00	01:30
	37	226	117	194	152	306
	.54	.58	.88	.85	.82	.91

Sunday

r :

CHI ASSOCIATES, INC.

et name :ACCESS TO BREAKS INTERSTATE PARK

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gin <------ EB(out) ------><------ WB(In) ------><------Combined ------> E/W

	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
0 08/18	0		5		0		3		0		8		Monday
:15	0		4		0		4		0		8		
:30	0		3		0		8		0		11		
5	0	*	6	18	0	*	3	18	0	*	9	36	
.00	0		6		0		5		0		11		
:15	1		4		1		7		2		11		
0	1		7		1		12		2		19		
5	0	2	9	26	0	2	9	33	0	4	18	59	
:00	0		6		0		1		0		7		
5	0		1		0		3		0		4		
0	1		13		0		2		1		15		
:45	0	1	4	24	1	1	2	8	1	2	6	32	
:00	2		9		0		3		2		12		
5	1		1		1		7		2		8		
.0	0		4		0		6		0		10		
:45	0	3	1	15	1	2	4	20	1	5	5	35	
0	0		13		0		2		0		15		
5	0		7		0		6		0		13		
:30	0		2		0		10		0		12		
15	0	*	9	31	0	*	4	22	0	*	13	53	
0	0		8		0		4		0		12		
:15	0		2		0		2		0		4		
:30	1		7		0		2		1		9		
45	1	2	4	21	0	*	6	14	1	2	10	35	
0	1		5		0		8		1		13		
:15	0		5		5		1		5		6		
30	0		2		1		4		1		6		
	0	1	3	15	5	11	7	20	5	12	10	35	
:00	1		7		3		2		4		9		
:15	0		5		5		4		5		9		
30	4		2		7		3		11		5		
45	9	14	1	15	6	21	1	10	15	35	2	25	
:00	10		4		3		2		13		6		
15	2		4		3		4		5		8		
30	3		0		7		0		10		0		
:45	8	23	4	12	4	17	2	8	12	40	6	20	
:00	4		5		3		2		7		7		
15	4		3		0		1		4		4		
30	7		0		4		0		11		0		
45	3	18	0	8	2	9	0	3	5	27	0	11	
00	2		1		6		1		8		2		
15	6		1		7		0		13		1		
30	2		0		4		1		6		1		
45	7	17	1	3	5	22	2	4	12	39	3	7	
00	6		0		8		0		14		0		
15	7		0		6		0		13		0		
0	3		0		5		0		8		0		
5	2	18	0	*	7	26	1	1	9	44	1	1	
ls	99		188		111		161		210		349		
Totals		287				272				559			
t %	47.1%		53.8%		52.8%		46.1%						

ur	07:30	04:00	11:00	01:00	10:45	01:00
	25	31	26	33	47	59
.	.62	.59	.81	.68	.83	.77

CHI ASSOCIATES, INC.

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et name :ACCESS TO BREAKS INTERSTATE PARK

E/W

gin	<------ EB (out) ------>				<------ WB (In) ------>				<------Combined ------>				Tuesday
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
0 08/19	1		0		0		1		1		1		
:1	0		3		0		6		0		9		
:20	0		6		0		7		0		13		
5	0	1	1	10	0	*	6	20	0	1	7	30	
:00	0		6		0		4		0		10		
:15	0		9		0		7		0		16		
0	0		7		0		5		0		12		
5	0	*	4	26	0	*	10	26	0	*	14	52	
2:00	0		3		0		7		0		10		
15	0		4		0		1		0		5		
0	0		2		0		5		0		7		
2:45	0	*	8	17	0	*	3	16	0	*	11	33	
3:00	0		5		0		4		0		9		
15	0		10		0		5		0		15		
.30	0		8		0		5		0		13		
3:45	0	*	9	32	0	*	6	20	0	*	15	52	
00	0		13		0		7		0		20		
15	0		6		0		5		0		11		
4:30	0		6		0		2		0		8		
45	0	*	7	32	0	*	3	17	0	*	10	49	
00	0		3		0		6		0		9		
5:15	0		4		0		3		0		7		
5:30	0		6		0		2		0		8		
45	2	2	1	14	0	*	6	17	2	2	7	31	
.00	1		10		0		2		1		12		
6:15	1		6		4		4		5		10		
	3		6		1		7		4		13		
	1	6	3	25	4	9	10	23	5	15	13	48	
7:00	1		5		5		4		6		9		
7:15	1		4		0		3		1		7		
:30	0		3		5		2		5		5		
7:45	1	3	4	16	3	13	4	13	4	16	8	29	
8:00	3		5		2		4		5		9		
:15	2		2		8		4		10		6		
:30	3		3		4		1		7		4		
3:45	7	15	3	13	2	16	2	11	9	31	5	24	
:00	3		1		1		3		4		4		
:15	1		2		2		2		3		4		
:30	0		5		2		1		2		6		
:45	3	7	4	12	12	17	1	7	15	24	5	19	
:00	1		0		2		0		3		0		
:15	3		0		4		0		7		0		
:30	8		1		4		1		12		2		
:45	6	18	1	2	3	13	0	1	9	31	1	3	
:00	2		0		4		1		6		1		
:15	0		0		2		1		2		1		
:30	6		1		6		1		12		2		
:45	3	11	1	2	3	15	1	4	6	26	2	6	
:als	63		201		83		175		146		376		
Totals		264				258				522			
it %	43.1%		53.4%		56.8%		46.5%						
our	10:15		03:15		09:45		01:15		09:45		03:15		
me	19		40		22		29		37		63		
.F.	.59		.76		.45		.72		.61		.78		

:161

er :

CHI ASSOCIATES, INC.

Site Code : T 12

Start Date: 08/16/97

File I.D. : T12_F1

Page : 5

eet name :ACCESS TO BREAKS INTERSTATE PARK

egin <------ EB(out) ------><------ WB(In) ------><------Combined ------> E/W

Wednesday

e	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
00 08/20	1		5		1		5		2		10	
2:	0		2		0		3		0		5	
30	0		1		0		4		0		5	
45	0	1	7	15	0	1	6	18	0	2	13	33
1:00	0		5		0		4		0		9	
1:15	0		4		0		6		0		10	
:30	0		1		0		1		0		2	
.45	0	*	4	14	0	*	7	18	0	*	11	32
2:00	0		8		0		2		0		10	
:15	0		4		0		5		0		9	
:30	0		5		0		3		0		8	
2:45	0	*	4	21	0	*	3	13	0	*	7	34
:00	0		4		0		3		0		7	
:15	0		5		0		3		0		8	
:30	0		2		0		6		0		8	
3:45	0	*	2	13	0	*	3	15	0	*	5	28
:00	0		13		0		2		0		15	
:15	0		3		0		3		0		6	
4:30	0		0		0		4		0		4	
:45	0	*	3	19	0	*	4	13	0	*	7	32
:00	0		3		0		3		0		6	
:15	0		3		0		4		0		7	
5:30	0		3		0		7		0		10	
:45	1	1	3	12	0	*	3	17	1	1	6	29
:00	1		3		1		0		2		3	
6:15	1		1		4		5		5		6	
:30	1		3		1		1		2		4	
	3	6	2	9	3	9	7	13	6	15	9	22
:00	2		1		2		3		4		4	
7:15	0		1		4		2		4		3	
:30	2		5		1		1		3		6	
:45	3	7	0	7	3	10	0	6	6	17	0	13
:00	1		4		3		3		4		7	
:15	2		1		4		1		6		2	
:30	4		4		4		3		8		7	
:45	4	11	5	14	1	12	1	8	5	23	6	22
:00	4		2		2		3		6		5	
:15	0		0		0		1		0		1	
:30	5		3		4		2		9		5	
45	1	10	1	6	3	9	1	7	4	19	2	13
00	1		1		2		0		3		1	
15	3		2		2		2		5		4	
30	5		0		3		1		8		1	
45	3	12	2	5	1	8	1	4	4	20	3	9
00	4		0		7		0		11		0	
15	2		0		3		0		5		0	
30	5		1		1		1		6		2	
45	2	13	0	1	1	12	0	1	3	25	0	2
ls	61		136		61		133		122		269	
Totals		197				194				391		
t %	50.0%		50.5%		50.0%		49.4%					
r	10:15		03:15		07:45		00:30		10:15		01:45	
e	15		22		14		20		28		38	
.	.75		.42		.87		.83		.63		.86	

APPENDIX B
MANUAL TRAFFIC COUNT DATA

ther :SUNNY/DRY
..nted by:CHI ASSOC.
oard # :D1-0853
:ation :M-1 (VA 83 @ VA 72 - G. FORK)

TURNING MOVEMENT COUNT
COAL FIELDS EXPRESSWAY
CHI ASSOCIATES, INC.

Study Name: M1_AMPM2
Site Code : 00000001
Start Date: 08/19/97
Page : 1

Vehicle group 1

Start Time	VA ROUTE 83 Westbound			VA ROUTE 72 Northbound			VA ROUTE 83 Eastbound			Intrvl. Total
	Left	Thru	Other	Left	Right	Other	Thru	Right	Other	
08/19/97										
08:00	14	44	0	11	26	0	35	7	0	137
08:15	15	40	0	4	22	0	31	8	0	120
08:30	13	38	0	14	16	0	36	8	0	125
08:45	10	44	0	9	24	0	39	9	0	135
Hour	52	166	0	38	88	0	141	32	0	517
09:00	14	39	0	9	23	0	45	5	0	135
09:15	14	47	0	8	18	0	20	4	0	111
09:30	13	36	0	6	22	0	34	4	0	115
09:45	24	50	0	5	25	0	23	4	0	131
Hour	65	172	0	28	88	0	122	17	0	492
10:00	17	40	0	7	16	0	28	3	0	111
10:15	21	48	0	3	19	0	20	7	0	118
10:30	21	46	0	8	17	0	35	6	0	133
10:45	22	33	0	4	11	0	47	4	0	121
Hour	81	167	0	22	63	0	130	20	0	483
[BREAK]										
15:00	33	60	0	21	40	0	38	4	0	196
15:15	22	58	0	16	23	0	46	10	0	175
15:30	27	52	0	9	30	0	65	18	0	201
15:45	21	51	0	6	26	0	79	13	0	196
Hour	103	221	0	52	119	0	228	45	0	768
16:00	20	47	0	5	19	0	60	7	0	158
16:15	27	50	0	9	30	0	56	10	0	182
16:30	24	54	0	5	27	0	52	9	0	171
16:45	16	52	0	7	23	0	57	10	0	165
Hour	87	203	0	26	99	0	225	36	0	676
17:00	29	71	0	8	19	1	67	8	0	203
17:15	39	48	0	5	33	0	68	7	0	200
17:30	40	33	0	3	16	0	78	13	0	183
17:45	14	46	0	1	14	0	52	15	0	142
Hour	122	198	0	17	82	1	265	43	0	728
Total	510	1127	0	183	539	1	1111	193	0	3664
% Apr.	31.1	68.8	-	25.3	74.5	0.1	85.1	14.8	-	-
% Int.	13.9	30.7	-	4.9	14.7	-	30.3	5.2	-	-

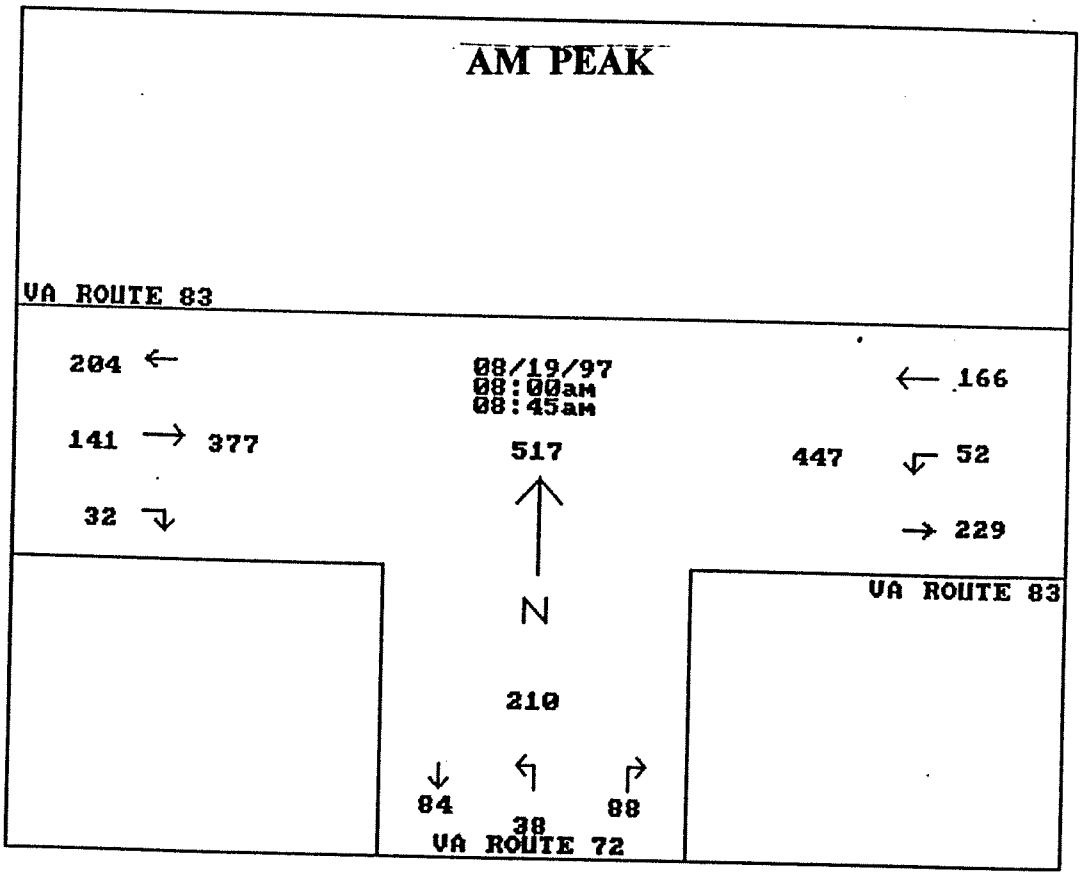
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0853
Location :M-1 (VA 83 @ VA 72 - G. FORK)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name:
Site Code :
Start Date:
Page :

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	VA ROUTE 72 Northbound Left	Right	Other	VA ROUTE 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97										
Time	08:00			08:00			08:00			
Vol.	52	166	0	38	88	0	141	32	0	
Pct.	23.8	76.1	0.0	30.1	69.8	0.0	81.5	18.4	0.0	
Total	218			126			173			
High	08:00			08:00			08:45			
Vol.	14	44	0	11	26	0	39	9	0	
Total	58			37			48			
PHF	0.939			0.851			0.901			



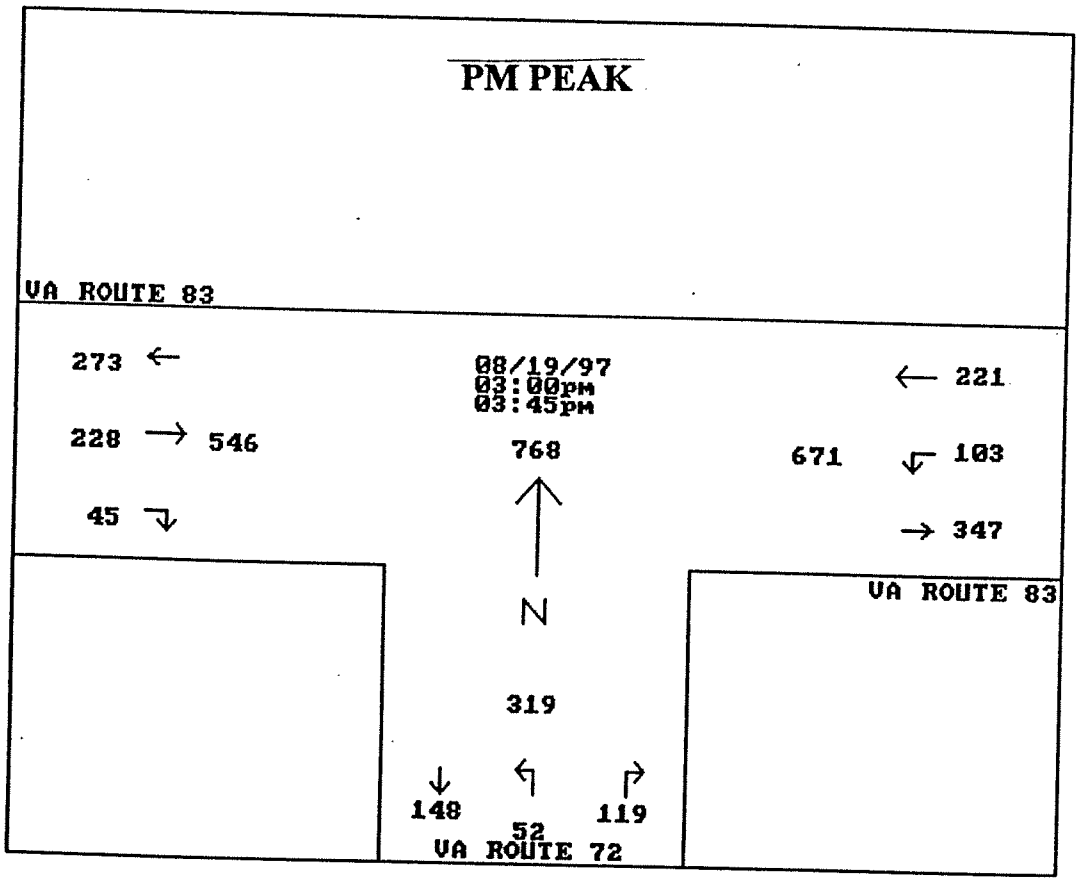
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0853
Location :M-1 (VA 83 @ VA 72 - G. FORK)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	VA ROUTE 72 Northbound Left	Right	Other	VA ROUTE 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	15:00			15:00			15:00			
Vol.	103	221	0	52	119	0	228	45	0	
Pct.	31.7	68.2	0.0	30.4	69.5	0.0	83.5	16.4	0.0	
Total	324			171			273			
High	15:00			15:00			15:45			
Vol.	33	60	0	21	40	0	79	13	0	
Total	93			61			92			
PHF	0.870			0.700			0.741			



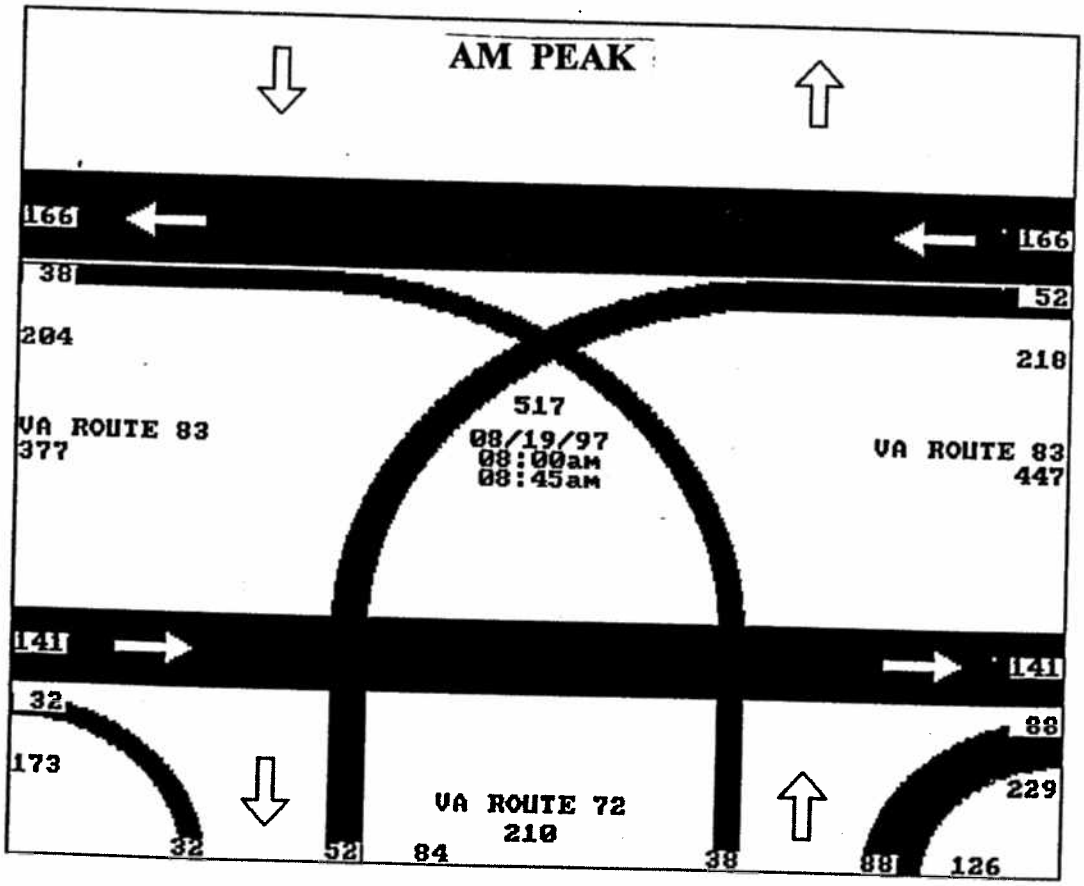
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0853
Location :M-1 (VA 83 @ VA 72 - G. FORK)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name:
Site Code :
Start Date:
Page :

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	VA ROUTE 72 Northbound Left	Right	Other	VA ROUTE 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97										
Time	08:00			08:00			08:00			
Vol.	52	166	0	38	88	0	141	32	0	
Pct.	23.8	76.1	0.0	30.1	69.8	0.0	81.5	18.4	0.0	
Total	218			126			173			
High	08:00			08:00			08:45			
Vol.	14	44	0	11	26	0	39	9	0	
Total	58			37			48			
PHF	0.939			0.851			0.901			



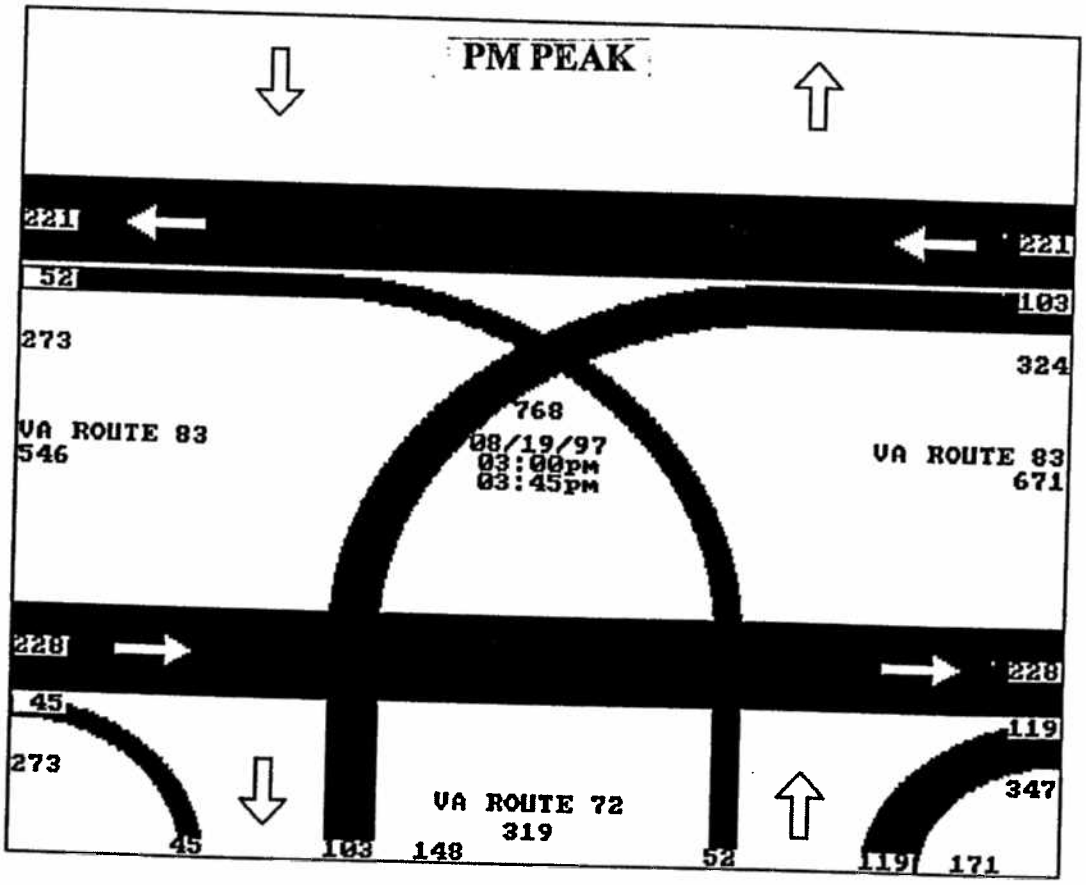
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0853
Location :M-1 (VA 83 @ VA 72 - G. FORK)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name:
Site Code :
Start Date:
Page :

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	VA ROUTE 72 Northbound Left	Right	Other	VA ROUTE 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	15:00			15:00			15:00			
Vol.	103	221	0	52	119	0	228	45	0	
Pct.	31.7	68.2	0.0	30.4	69.5	0.0	83.5	16.4	0.0	
Total	324			171			273			
High	15:00			15:00			15:45			
Vol.	33	60	0	21	40	0	79	13	0	
Total	93			61			92			
PHF	0.870			0.700			0.741			



unted by:CHI ASSOC.
board # :D1-0855
Location :M-2 (VA 83 @ T-607 CLINTWOOD)

COAL FIELDS EXPRESSWAY
CHI ASSOCIATES, INC.

Study Name: M2_AMPM
Site Code : 00000002
Start Date: 08/19/97
Page : 1

Vehicle group 1

Start Time	ROUTE 607 Southbound Left	Right	Other	VA ROUTE 83 Westbound Thru	Right	Other	VA ROUTE 83 Eastbound Left	Thru	Other	Intrvl. Total
08/19/97										
08:00	26	66	0	62	19	0	47	54	0	274
08:15	18	54	0	49	20	0	50	38	0	229
08:30	14	41	0	57	27	0	45	42	0	226
08:45	10	43	0	35	9	0	50	45	0	192
Hour	68	204	0	203	75	0	192	179	0	921
09:00	15	30	0	51	19	0	52	54	0	221
09:15	16	44	0	54	13	0	49	54	0	230
09:30	16	47	0	65	20	0	57	39	0	244
09:45	16	56	0	60	29	0	67	42	0	270
Hour	63	177	0	230	81	0	225	189	0	965
10:00	5	70	0	60	19	0	51	54	0	259
10:15	19	54	0	56	13	0	43	49	0	234
10:30	15	43	0	75	19	0	71	36	0	259
10:45	12	42	0	52	13	0	44	55	0	218
Hour	51	209	0	243	64	0	209	194	0	970
[BREAK]										
15:00	21	59	0	69	20	0	53	47	0	269
15:15	33	72	0	73	31	0	78	74	0	361
15:30	18	55	0	67	16	0	66	59	0	281
15:45	24	68	0	57	21	0	62	62	0	294
Hour	96	254	0	266	88	0	259	242	0	1205
16:00	20	47	0	64	19	0	75	78	0	303
16:15	19	54	0	64	25	0	70	67	0	299
16:30	21	72	0	52	20	0	68	72	0	305
16:45	32	64	0	68	18	0	81	60	0	323
Hour	92	237	0	248	82	0	294	277	0	1230
17:00	29	59	0	69	21	0	71	61	0	310
17:15	25	48	0	80	25	0	98	58	0	334
17:30	20	68	0	70	27	0	57	62	0	304
17:45	22	61	0	61	14	0	66	60	0	284
Hour	96	236	0	280	87	0	292	241	0	1232
Total	466	1317	0	1470	477	0	1471	1322	0	6523
% Apr.	26.1	73.8	-	75.5	24.4	-	52.6	47.3	-	-
% Int.	7.1	20.1	-	22.5	7.3	-	22.5	20.2	-	-

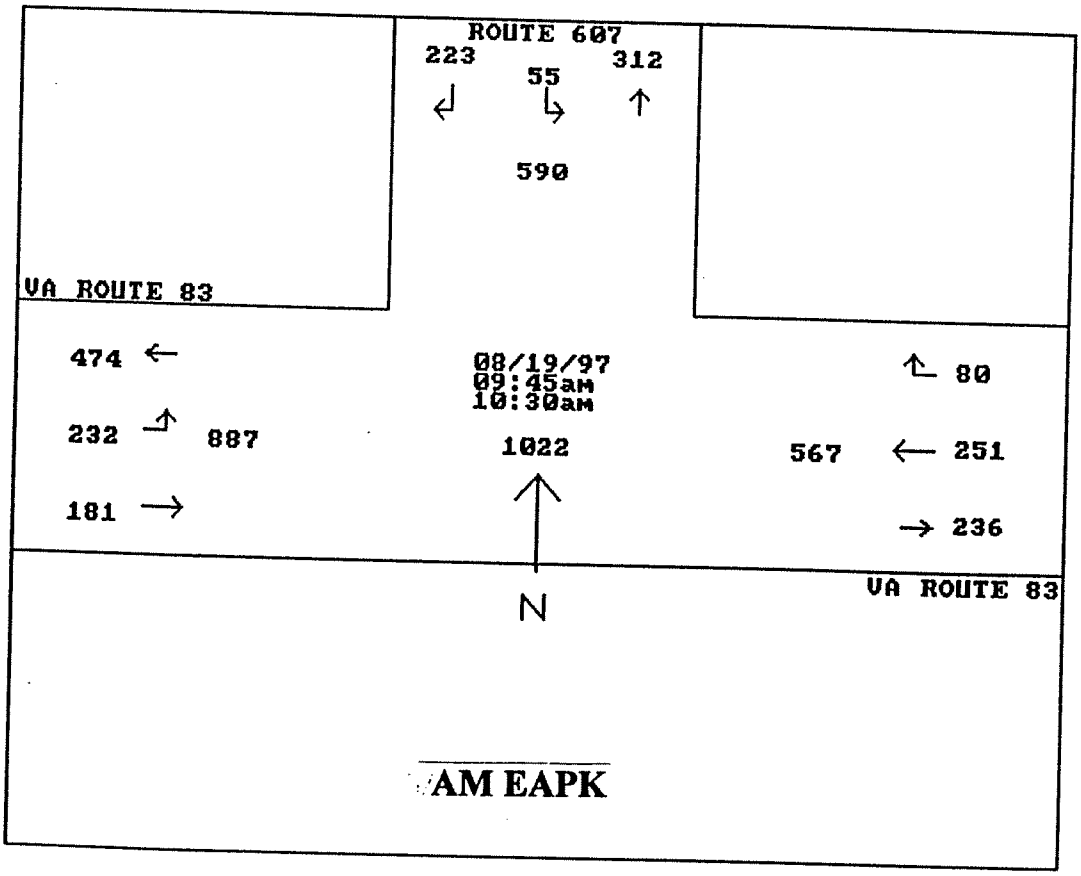
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0855
Location :M-2 (VA 83 @ T-607 CLINTWOOD)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	ROUTE 607 Southbound Left	Right	Other	VA ROUTE 83 Westbound Thru	Right	Other	VA ROUTE 83 Eastbound Left	Thru	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97										
Time	09:45			09:45			09:45			
Vol.	55	223	0	251	80	0	232	181	0	
Pct.	19.7	80.2	0.0	75.8	24.1	0.0	56.1	43.8	0.0	
Total	278			331			413			
High	10:00			10:30			09:45			
Vol.	5	70	0	75	19	0	67	42	0	
Total	75			94			109			
PHF	0.926			0.880			0.947			



AM EAPK

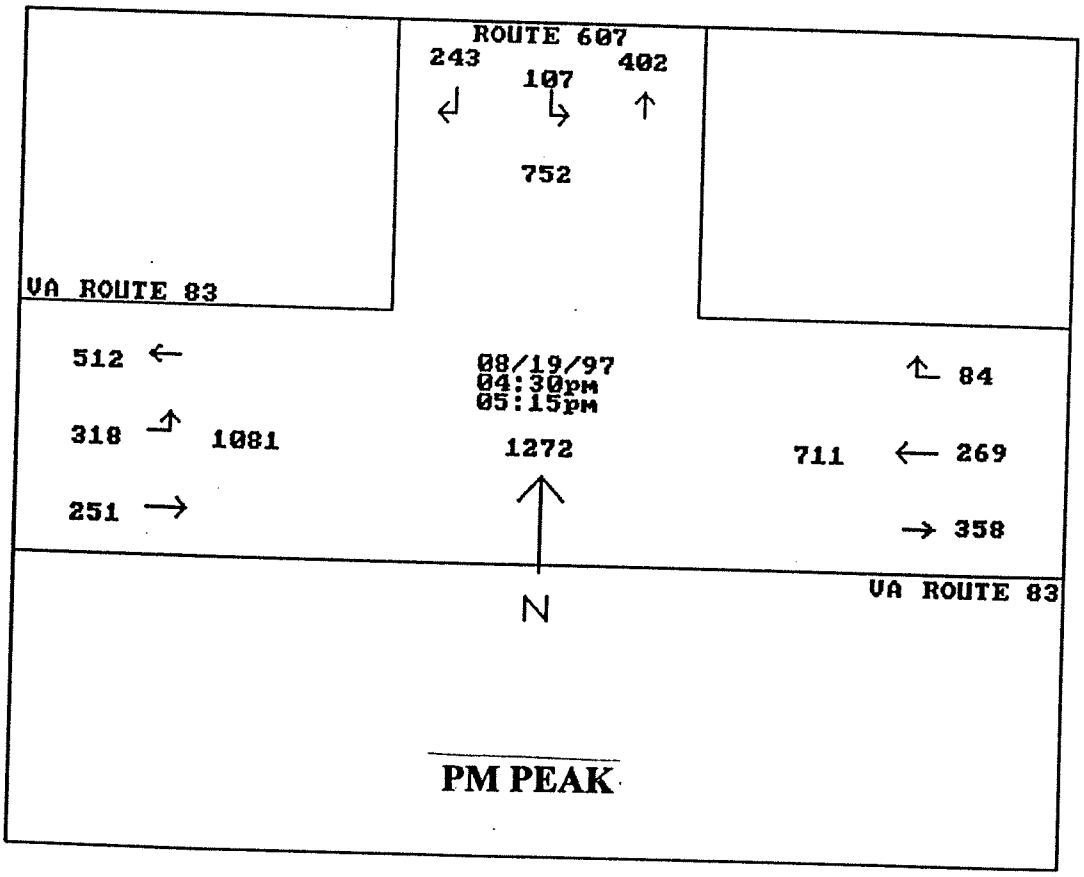
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0855
Location :M-2 (VA 83 @ T-607 CLINTWOOD)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	ROUTE 607 Southbound Left	Right	Other	VA ROUTE 83 Westbound Thru	Right	Other	VA ROUTE 83 Eastbound Left	Thru	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	16:30			16:30			16:30			
Vol.	107	243	0	269	84	0	318	251	0	
Pct.	30.5	69.4	0.0	76.2	23.7	0.0	55.8	44.1	0.0	
Total	350			353			569			
High	16:45			17:15			17:15			
Vol.	32	64	0	80	25	0	98	58	0	
Total	96			105			156			
PHF	0.911			0.840			0.911			



Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0855
Location :M-2 (VA 83 @ T-607 CLINTWOOD)

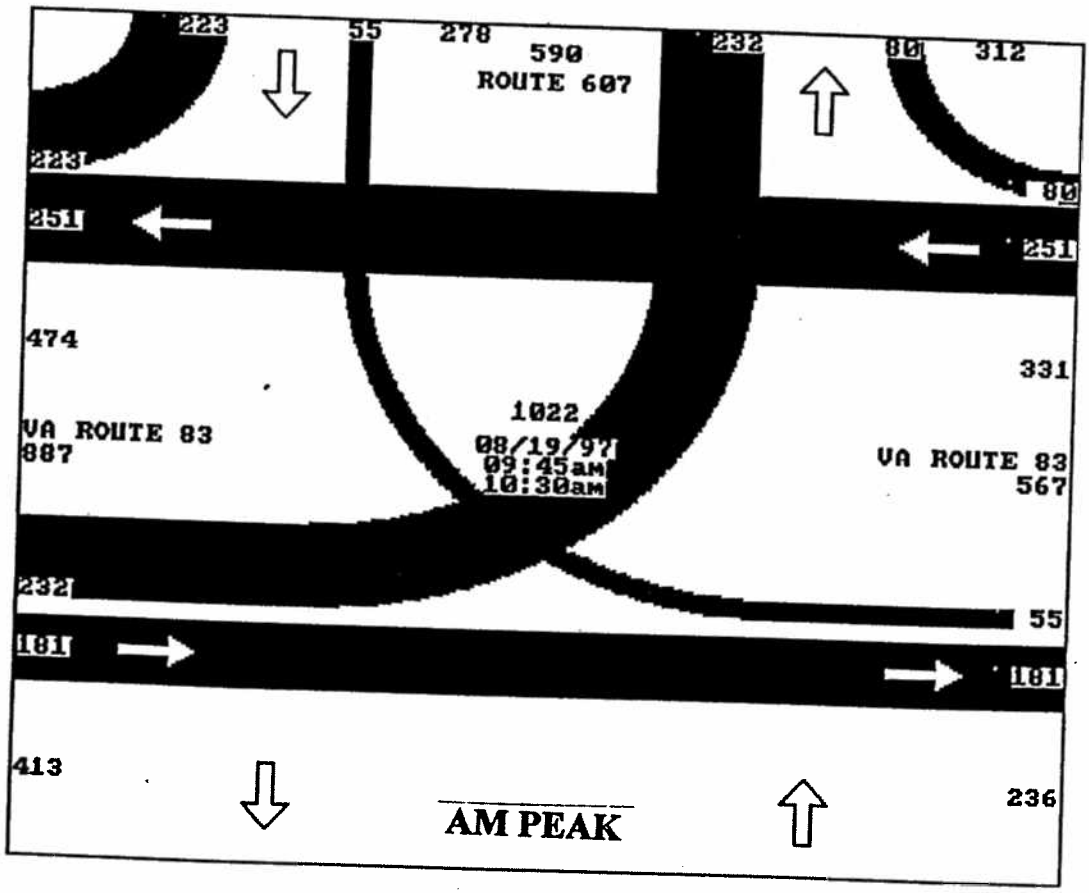
COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Vehicle group 1

Study Name
Site Code
Start Date
Page :

Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97

Time	09:45			09:45			09:45		
Vol.	55	223	0	251	80	0	232	181	0
Pct.	19.7	80.2	0.0	75.8	24.1	0.0	56.1	43.8	0.0
Total	278			331			413		
High	10:00			10:30			09:45		
Vol.	5	70	0	75	19	0	67	42	0
Total	75			94			109		
PHF	0.926			0.880			0.947		



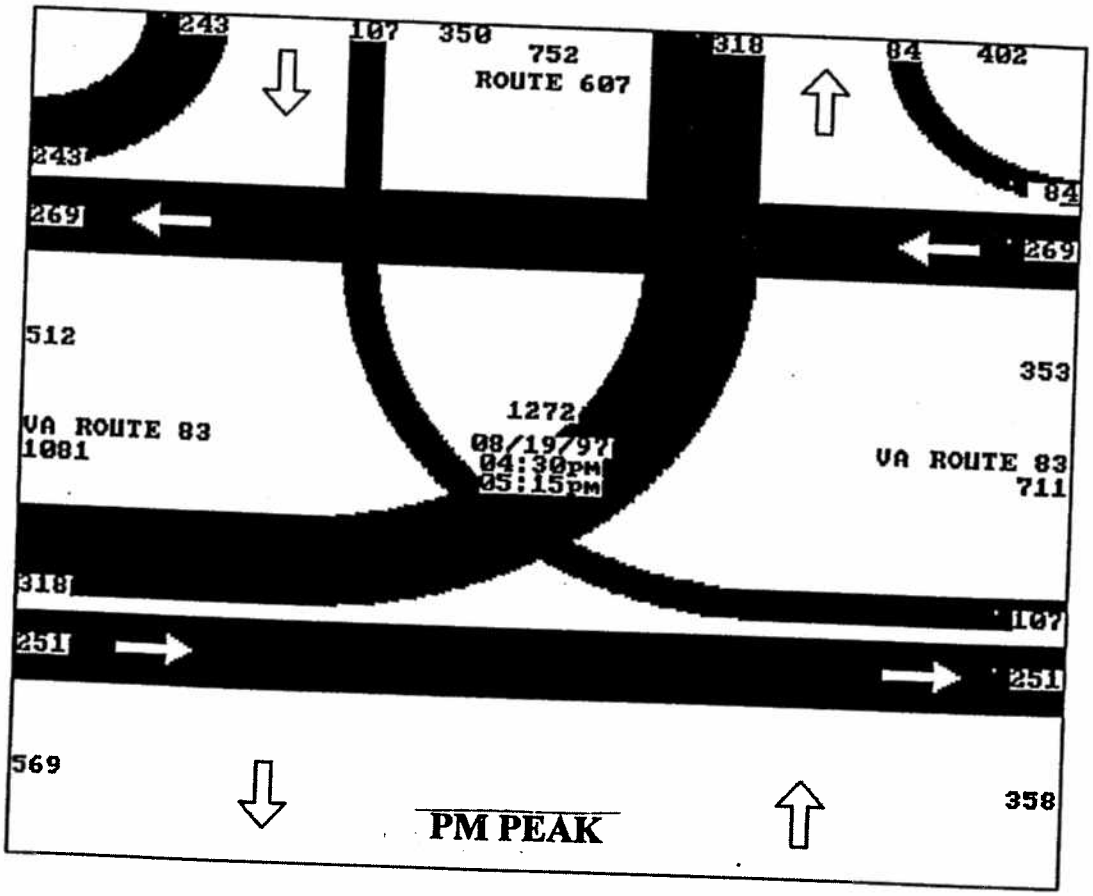
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0855
Location :M-2 (VA 83 @ T-607 CLINTWOOD)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	ROUTE 607 Southbound Left	Right	Other	VA ROUTE 83 Westbound Thru	Right	Other	VA ROUTE 83 Eastbound Left	Thru	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	16:30			16:30			16:30			
Vol.	107	243	0	269	84	0	318	251	0	
Pct.	30.5	69.4	0.0	76.2	23.7	0.0	55.8	44.1	0.0	
Total	350			353			569			
High	16:45			17:15			17:15			
Vol.	32	64	0	80	25	0	98	58	0	
Total	96			105			156			
PHF	0.911			0.840			0.911			



ather :SUNNY/DRY
inted by:CHI ASSOC.
oard # :D1-0856
ocation :M-3 (VA 83 @ VA 80 S. -HAYSI)

COAL FIELDS EXPRESSWAY
CHI ASSOCIATES, INC.

Study Name: M3_AMPM2
Site Code : 00000003
Start Date: 08/19/97
Page : 1

Vehicle group 1

Start Time	VA ROUTE 80 Westbound			VA ROUTE 83 Northbound			VA 80/VA 83 Eastbound			Intrvl. Total
	Left	Thru	Other	Left	Right	Other	Thru	Right	Other	
08/19/97										
08:00	17	22	0	19	9	0	30	23	0	120
08:15	15	25	0	20	10	0	19	14	0	103
08:30	6	13	0	11	8	0	13	15	0	66
08:45	9	25	0	17	4	0	23	18	0	96
Hour	47	85	0	67	31	0	85	70	0	385
09:00	7	16	0	8	7	0	15	12	0	65
09:15	4	11	0	10	6	0	17	12	0	60
09:30	6	19	0	14	10	0	10	14	0	73
09:45	4	21	0	23	9	0	22	17	0	96
Hour	21	67	0	55	32	0	64	55	0	294
10:00	3	15	0	16	7	0	18	16	0	75
10:15	10	11	0	15	3	0	16	8	0	63
10:30	13	8	0	23	13	0	23	19	0	99
10:45	5	21	0	10	4	0	21	18	0	79
Hour	31	55	0	64	27	0	78	61	0	316
[BREAK]										
15:00	12	62	0	15	8	0	15	13	0	125
15:15	12	50	0	15	6	0	29	10	0	122
15:30	11	32	0	18	14	0	19	27	0	121
15:45	10	19	0	20	6	0	24	28	0	107
Hour	45	163	0	68	34	0	87	78	0	475
16:00	14	21	0	19	20	0	50	30	0	154
16:15	5	34	0	26	23	0	28	21	0	137
16:30	7	25	0	16	9	0	25	13	0	95
16:45	8	24	0	18	4	0	28	24	0	106
Hour	34	104	0	79	56	0	131	88	0	492
17:00	4	20	0	16	14	0	27	20	0	101
17:15	5	19	0	14	11	0	22	22	0	93
17:30	4	24	0	28	10	0	21	16	0	103
17:45	7	16	0	13	9	0	33	26	0	104
Hour	20	79	0	71	44	0	103	84	0	401
Total	198	553	0	404	224	0	548	436	0	2363
% Apr.	26.3	73.6	-	64.3	35.6	-	55.6	44.3	-	-
% Int.	8.3	23.4	-	17.0	9.4	-	23.1	18.4	-	-

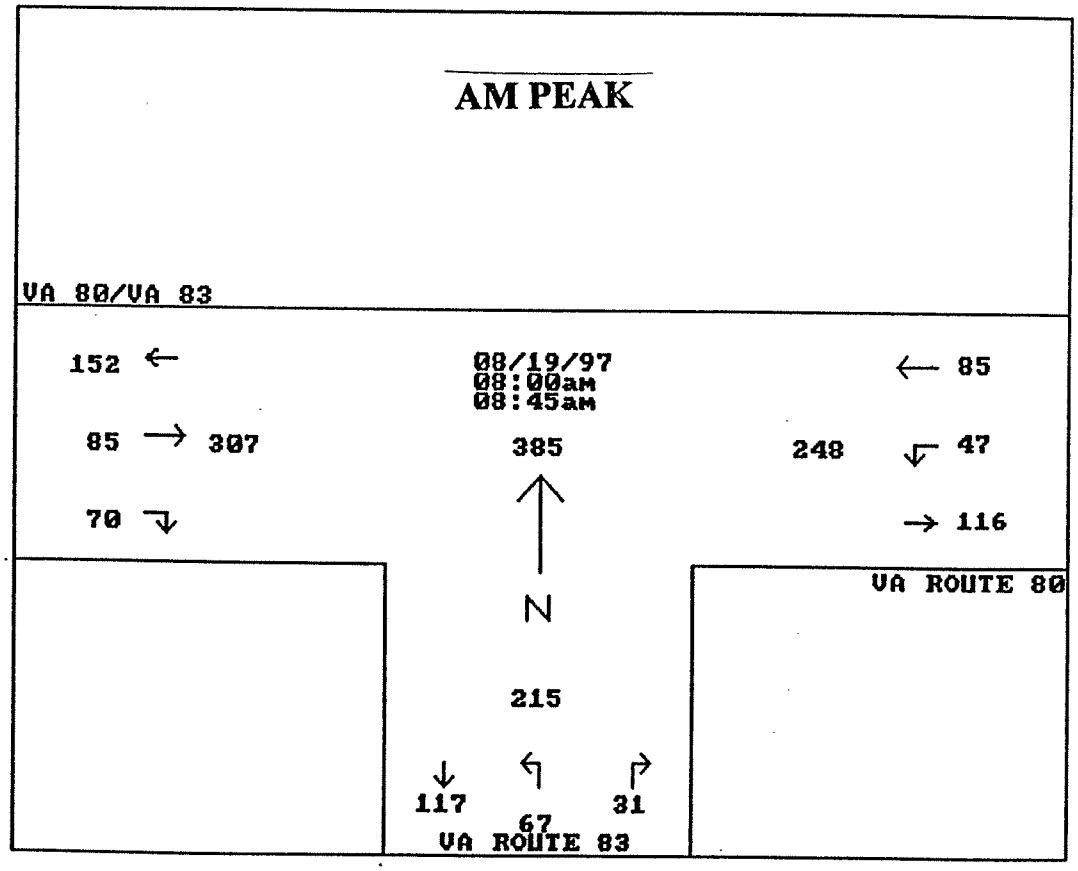
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0856
Location :M-3 (VA 83 @ VA 80 N. -HAYSI)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name: |
Site Code : |
Start Date: |
Page : :

Vehicle group 1

Start Time	VA ROUTE 80 Westbound Left	Thru	Other	VA ROUTE 83 Northbound Left	Right	Other	VA 80/VA 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97										
Time	08:00			08:00			08:00			
Vol.	47	85	0	67	31	0	85	70	0	
Pct.	35.6	64.3	0.0	68.3	31.6	0.0	54.8	45.1	0.0	
Total	132			98			155			
High	08:15			08:15			08:00			
Vol.	15	25	0	20	10	0	30	23	0	
Total	40			30			53			
PHF	0.825			0.816			0.731			



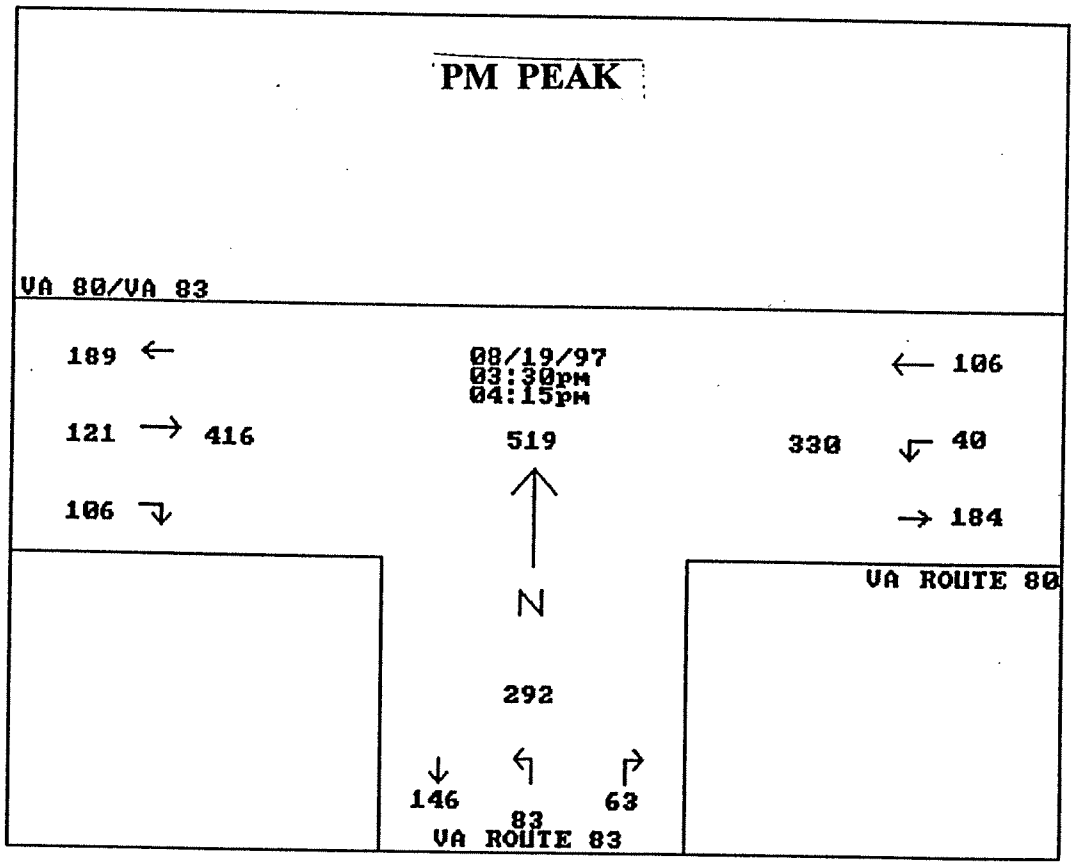
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0856
Location :M-3 (VA 83 @ VA 80 N. -HAYSI)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name:
Site Code :
Start Date:
Page :

Vehicle group 1

Start Time	VA ROUTE 80 Westbound Left	Thru	Other	VA ROUTE 83 Northbound Left	Right	Other	VA 80/VA 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	15:30			15:30			15:30			
Vol.	40	106	0	83	63	0	121	106	0	
Pct.	27.3	72.6	0.0	56.8	43.1	0.0	53.3	46.6	0.0	
Total	146			146			227			
High	15:30			16:15			16:00			
Vol.	11	32	0	26	23	0	50	30	0	
Total	43			49			80			
PHF	0.848			0.744			0.709			



Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0856
Location :M-3 (VA 83 @ VA 80 N. -HAYSI)

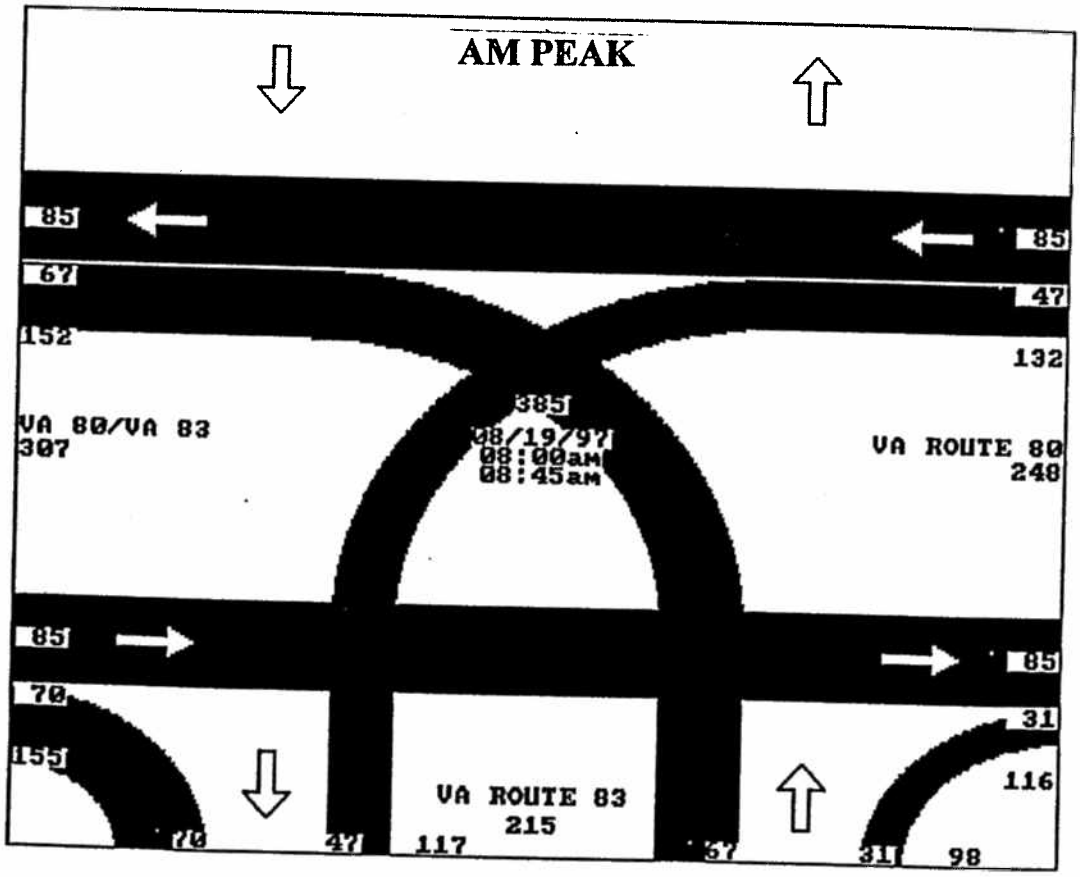
COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Vehicle group 1

Study Name:
Site Code :
Start Date:
Page :

Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97

Time	08:00			08:00			08:00		
Vol.	47	85	0	67	31	0	85	70	0
Pct.	35.6	64.3	0.0	68.3	31.6	0.0	54.8	45.1	0.0
Total	132			98			155		
High	08:15			08:15			08:00		
Vol.	15	25	0	20	10	0	30	23	0
Total	40			30			53		
PHF	0.825			0.816			0.731		



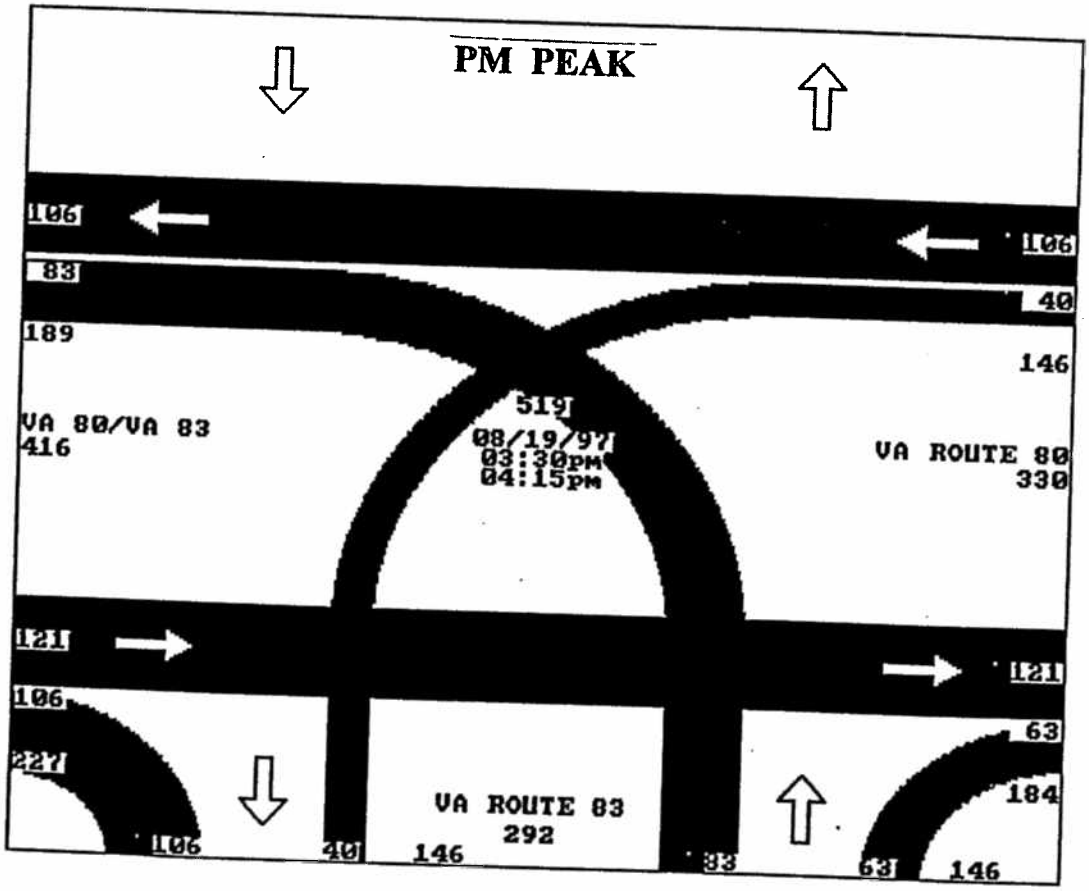
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0856
Location :M-3 (VA 83 @ VA 80 N. -HAYSI)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	VA ROUTE 80 Westbound Left	Thru	Other	VA ROUTE 83 Northbound Left	Right	Other	VA 80/VA 83 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	15:30			15:30			15:30			
Vol.	40	106	0	83	63	0	121	106	0	
Pct.	27.3	72.6	0.0	56.8	43.1	0.0	53.3	46.6	0.0	
Total	146			146			227			
High	15:30			16:15			16:00			
Vol.	11	32	0	26	23	0	50	30	0	
Total	43			49			80			
PHF	0.848			0.744			0.709			



:ather :SUNNY/DRY
.ounted by:CHI ASSOC.
3oard # :D1-0854
ther :M-4 (VA 83 @ VA 80 N. -HAYSI)

YORKING HOVBARRY COUNT
COAL FIELDS EXPRESSWAY
CHI ASSOCIATES, INC.

Study Name: M4_AMPM
Site Code : 0000000
Start Date: 08/19/9
Page : 1

Vehicle group 1

Start Time	VA ROUTE 80 Southbound Left	Thru	Other	VA ROUTE 83 Westbound Left	Right	Other	VA ROUTE 80 Northbound Thru	Right	Other	Intrvl. Total
08/19/97										
08:00	1	21	0	14	3	0	5	23	0	67
08:15	2	5	0	14	5	0	10	16	0	52
08:30	2	9	0	12	1	0	7	10	0	41
08:45	0	15	0	24	0	0	3	15	0	57
Hour	5	50	0	64	9	0	25	64	0	217
09:00	1	13	0	11	0	0	14	17	0	56
09:15	0	11	0	20	1	0	9	12	0	53
09:30	0	5	0	12	2	0	6	15	0	40
09:45	1	6	0	14	0	0	10	12	0	43
Hour	2	35	0	57	3	0	39	56	0	192
10:00	3	11	0	16	1	0	10	24	0	65
10:15	0	9	0	16	2	0	8	18	0	53
10:30	3	18	0	16	1	0	9	12	0	59
10:45	0	11	0	16	1	0	10	18	0	56
Hour	6	49	0	64	5	0	37	72	0	233
[BREAK]										
15:00	0	12	0	19	1	0	7	20	0	59
15:15	2	8	0	11	7	0	13	22	0	63
15:30	3	7	0	22	2	0	26	29	0	89
15:45	2	18	0	18	2	0	10	30	0	80
Hour	7	45	0	70	12	0	56	101	0	291
16:00	4	14	0	23	2	0	12	22	0	77
16:15	11	64	0	16	0	0	16	15	0	122
16:30	4	23	0	14	6	0	15	16	0	78
16:45	3	23	0	17	4	0	13	15	0	75
Hour	22	124	0	70	12	0	56	68	0	352
17:00	1	17	0	28	0	0	8	20	0	74
17:15	3	13	0	17	1	0	15	20	0	69
17:30	2	10	0	24	0	0	13	15	0	64
17:45	1	10	0	31	2	0	17	20	0	81
Hour	7	50	0	100	3	0	53	75	0	288
Total	49	353	0	425	44	0	266	436	0	1573
% Apr.	12.1	87.8	-	90.6	9.3	-	37.8	62.1	-	-
% Int.	3.1	22.4	-	27.0	2.7	-	16.9	27.7	-	-

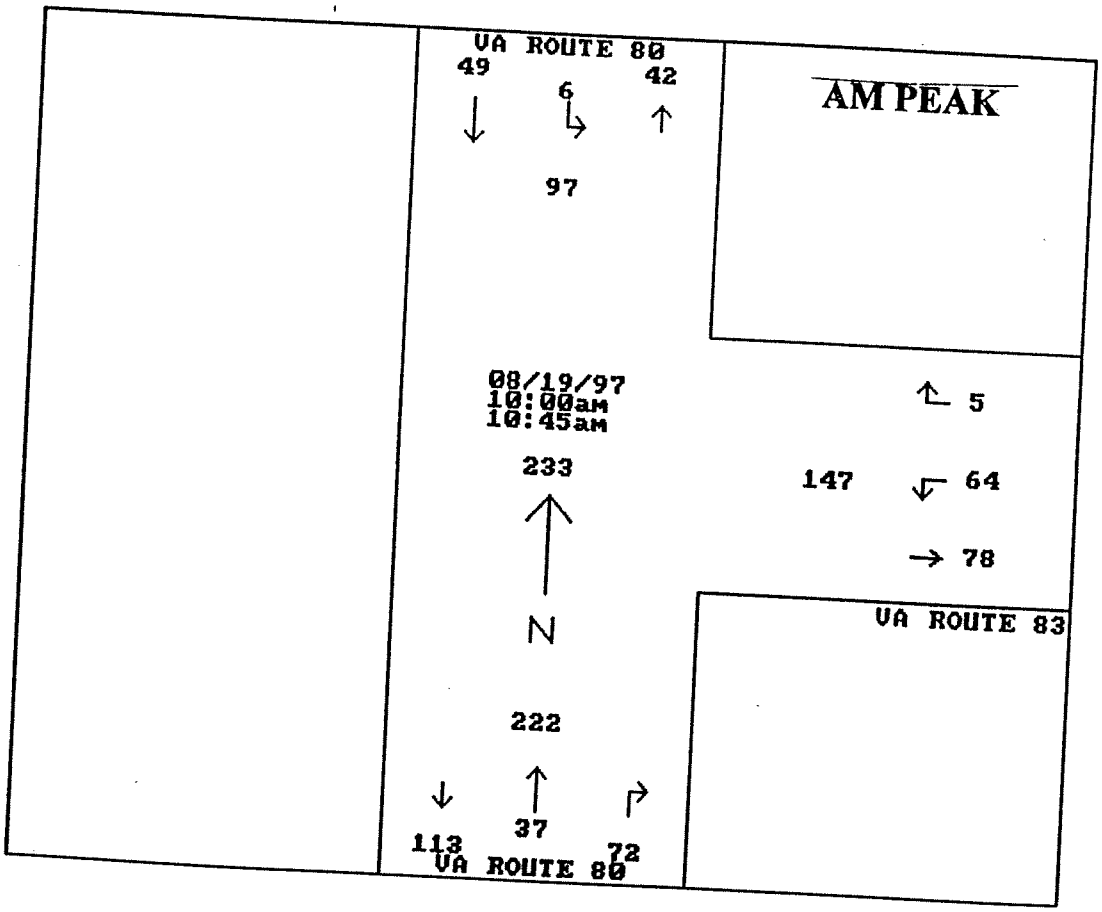
:ather :SUNNY/DRY
ounted by:CHI ASSOC.
oard # :D1-0854
:her :M-4

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name:
Site Code :
Start Date:
Page :

Vehicle group 1

Start Time	VA ROUTE 80 Southbound Left	Thru	Other	VA ROUTE 83 Westbound Left	Right	Other	VA ROUTE 80 Northbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97										
Time	10:00			10:00			10:00			
Vol.	6	49	0	64	5	0	37	72	0	
Pct.	10.9	89.0	0.0	92.7	7.2	0.0	33.9	66.0	0.0	
Total	55			69			109			
High	10:30			10:15			10:00			
Vol.	3	18	0	16	2	0	10	24	0	
Total	21			18			34			
PHF	0.654			0.958			0.801			



Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0854
Other :M-4

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Nam
Site Code
Start Date
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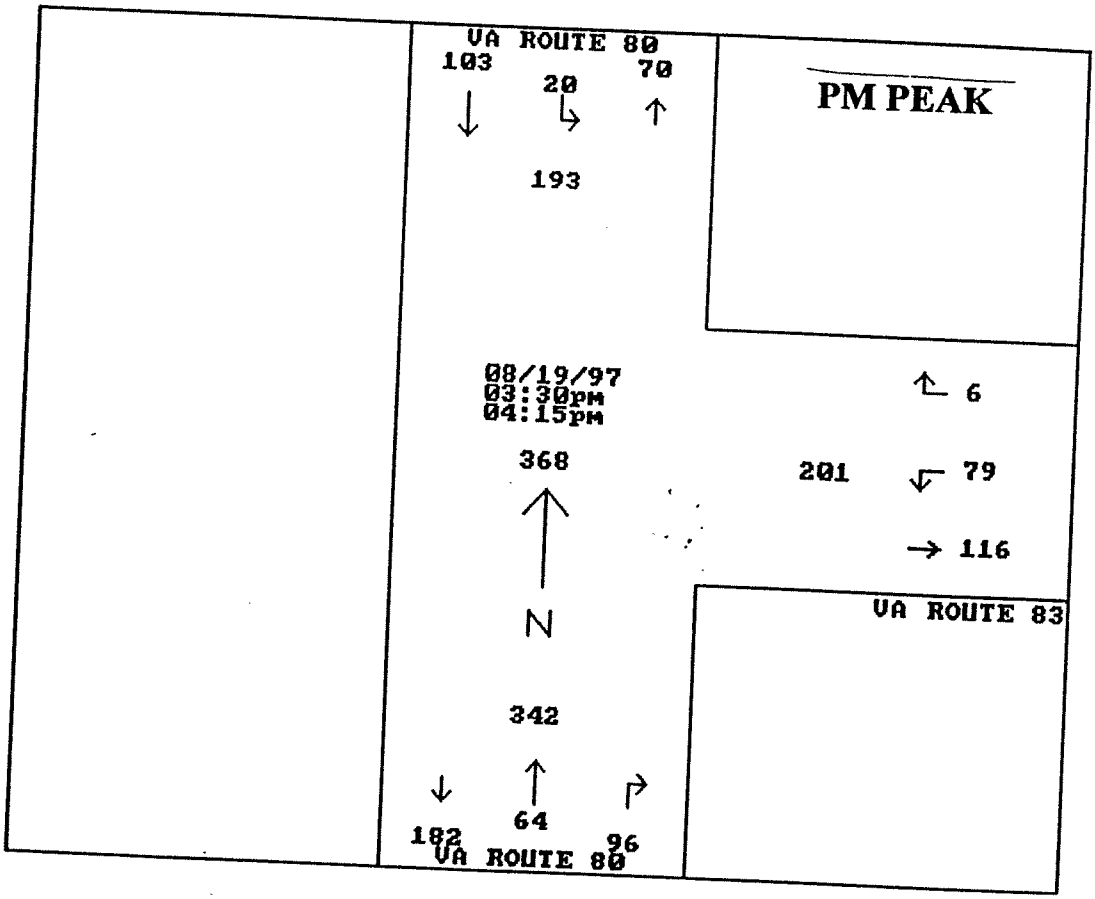
Vehicle group 1

Start Time	VA ROUTE 80 Southbound Left	Thru	Other	VA ROUTE 83 Westbound Left	Right	Other	VA ROUTE 80 Northbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	15:30			15:30			15:30			
Vol.	20	103	0	79	6	0	64	96	0	
Pct.	16.2	83.7	0.0	92.9	7.0	0.0	40.0	60.0	0.0	
Total	123			85			160			
High	16:15			16:00			15:30			
Vol.	11	64	0	23	2	0	26	29	0	
Total	75			25			55			
PHF	0.410			0.850			0.727			



'eather :SUNNY/DRY
'ounted by:CHI ASSOC.
Board # :D1-0854
Other :M-4

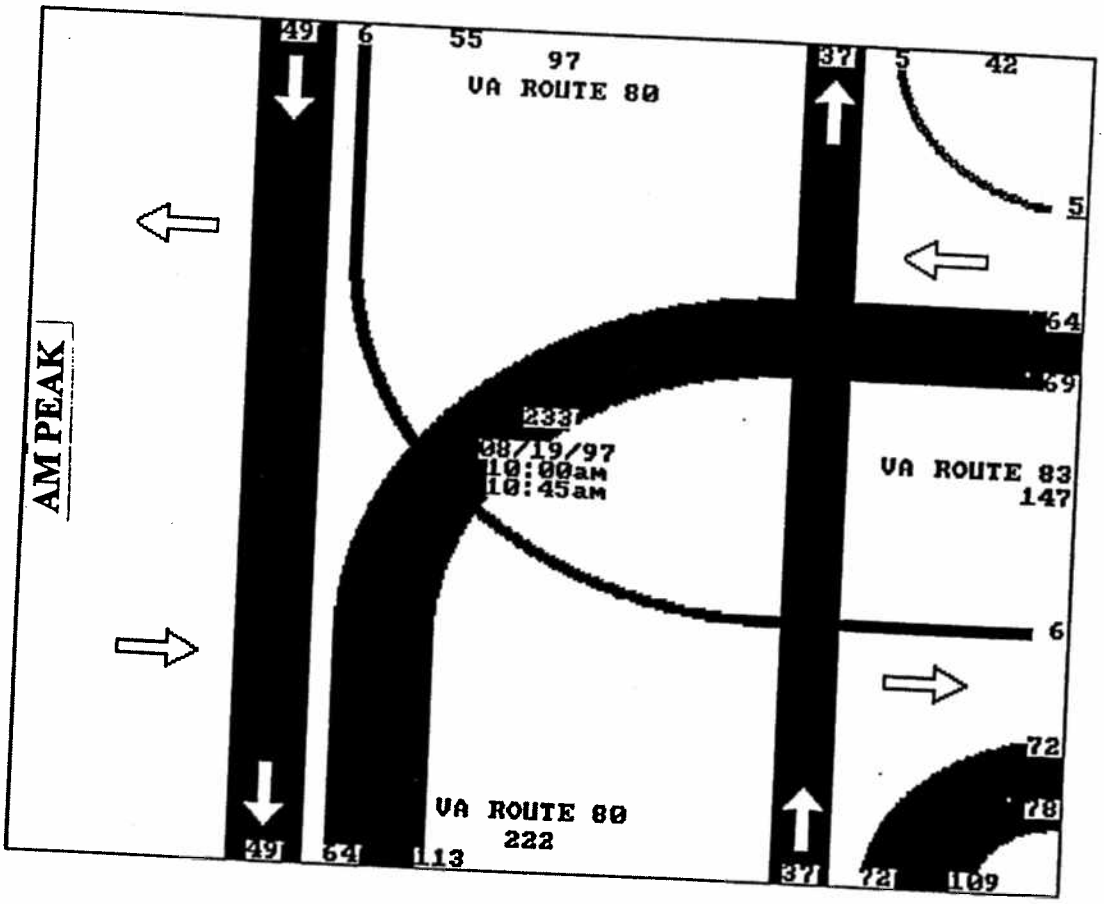
COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97

Time	10:00			10:00			10:00		
Vol.	6	49	0	64	5	0	37	72	0
Pct.	10.9	89.0	0.0	92.7	7.2	0.0	33.9	66.0	0.0
Total	55			69			109		
High	10:30			10:15			10:00		
Vol.	3	18	0	16	2	0	10	24	0
Total	21			18			34		
PHF	0.654			0.958			0.801		



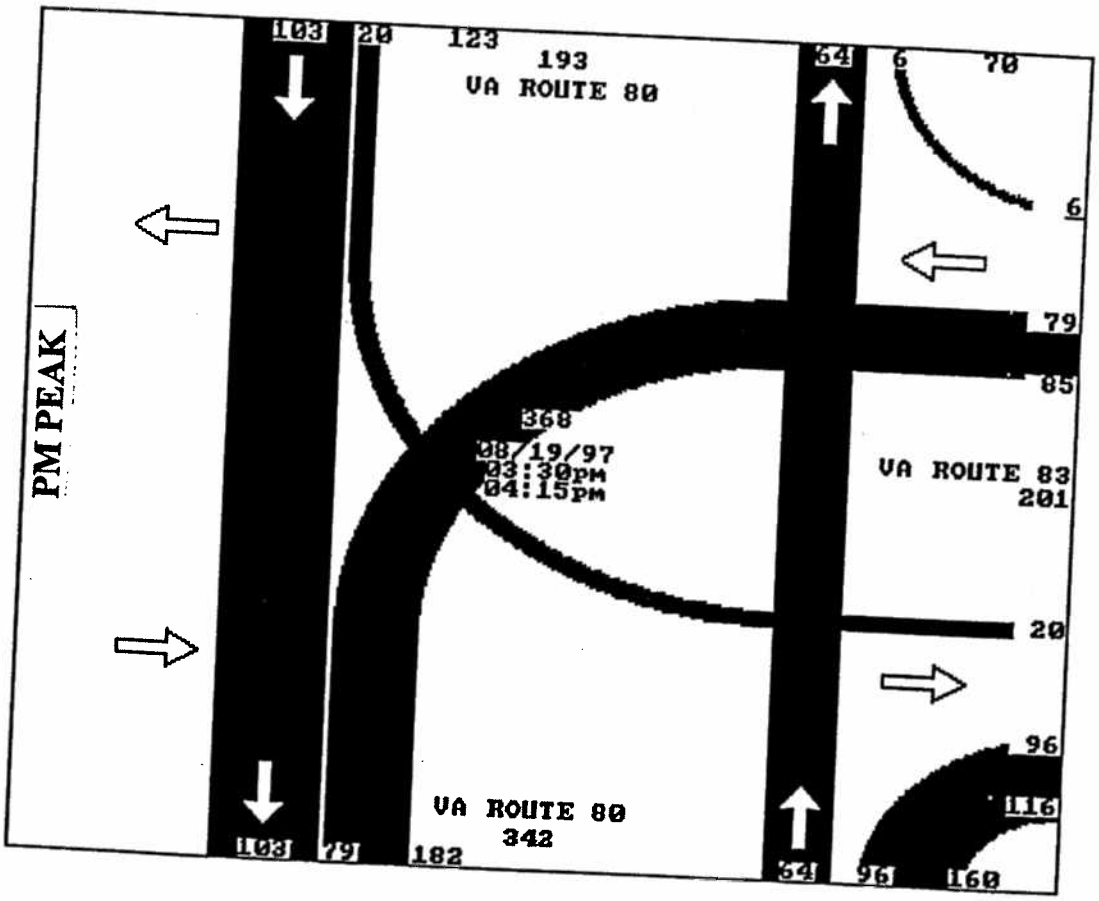
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0854
Other :M-4

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	VA ROUTE 80 Southbound Left	Thru	Other	VA ROUTE 83 Westbound Left	Right	Other	VA ROUTE 80 Northbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	15:30			15:30			15:30			
Vol.	20	103	0	79	6	0	64	96	0	
Pct.	16.2	83.7	0.0	92.9	7.0	0.0	40.0	60.0	0.0	
Total	123			85			160			
High	16:15			16:00			15:30			
Vol.	11	64	0	23	2	0	26	29	0	
Total	75			25			55			
PHF	0.410			0.850			0.727			



Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0852
Location :M-5 (US 460/VA 83@ 83-GRUNDY)

COAL FIELDS EXPRESSWAY
CHI ASSOCIATES, INC.

Study Name: M5_AM
Site Code : 00000
Start Date: 08/19/
Page : 1

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	US 460/VA 83 Northbound Left	Right	Other	US ROUTE 460 Eastbound Thru	Right	Other	Intrvl. Total
08/19/97										
08:00	0	96	0	56	79	0	55	0	0	286
08:15	0	94	0	61	68	0	35	0	0	258
08:30	0	79	0	68	69	0	31	0	0	247
08:45	0	59	0	64	64	0	23	0	0	210
Hour	0	328	0	249	280	0	144	0	0	1001
09:00	0	82	0	78	45	0	22	0	0	227
09:15	0	79	0	64	43	0	25	0	0	211
09:30	0	85	0	73	54	0	26	0	0	238
09:45	0	85	0	71	43	0	22	0	0	221
Hour	0	331	0	286	185	0	95	0	0	897
10:00	0	69	0	64	63	0	28	0	0	224
10:15	0	82	0	58	54	0	38	0	0	232
10:30	0	79	0	82	50	0	29	0	0	240
10:45	0	66	0	74	63	0	27	0	0	230
Hour	0	296	0	278	230	0	122	0	0	926
[BREAK]										
15:00	0	81	0	107	84	0	23	0	0	295
15:15	0	121	0	91	70	0	39	0	0	321
15:30	0	139	0	93	76	0	28	0	0	336
15:45	0	125	0	100	73	0	27	0	0	325
Hour	0	466	0	391	303	0	117	0	0	1277
16:00	0	112	0	76	68	0	30	0	0	286
16:15	0	101	0	88	51	0	33	0	0	273
16:30	0	88	0	106	73	0	25	0	0	292
16:45	0	91	0	84	79	0	36	0	0	290
Hour	0	392	0	354	271	0	124	0	0	1141
17:00	0	96	0	139	109	0	49	0	0	393
17:15	0	123	0	82	74	0	26	0	0	305
17:30	0	101	0	68	71	0	28	0	0	268
17:45	0	63	0	80	68	0	35	0	0	246
Hour	0	383	0	369	322	0	138	0	0	1212
Total	0	2196	0	1927	1591	0	740	0	0	6454
% Apr.	-	100.0	-	54.7	45.2	-	100.0	-	-	-
% Int.	-	34.0	-	29.8	24.6	-	11.4	-	-	-

Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0852
Location :M-5 (US 460/VA 83@ 83-GRUNDY)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Nam
Site Code
Start Dat
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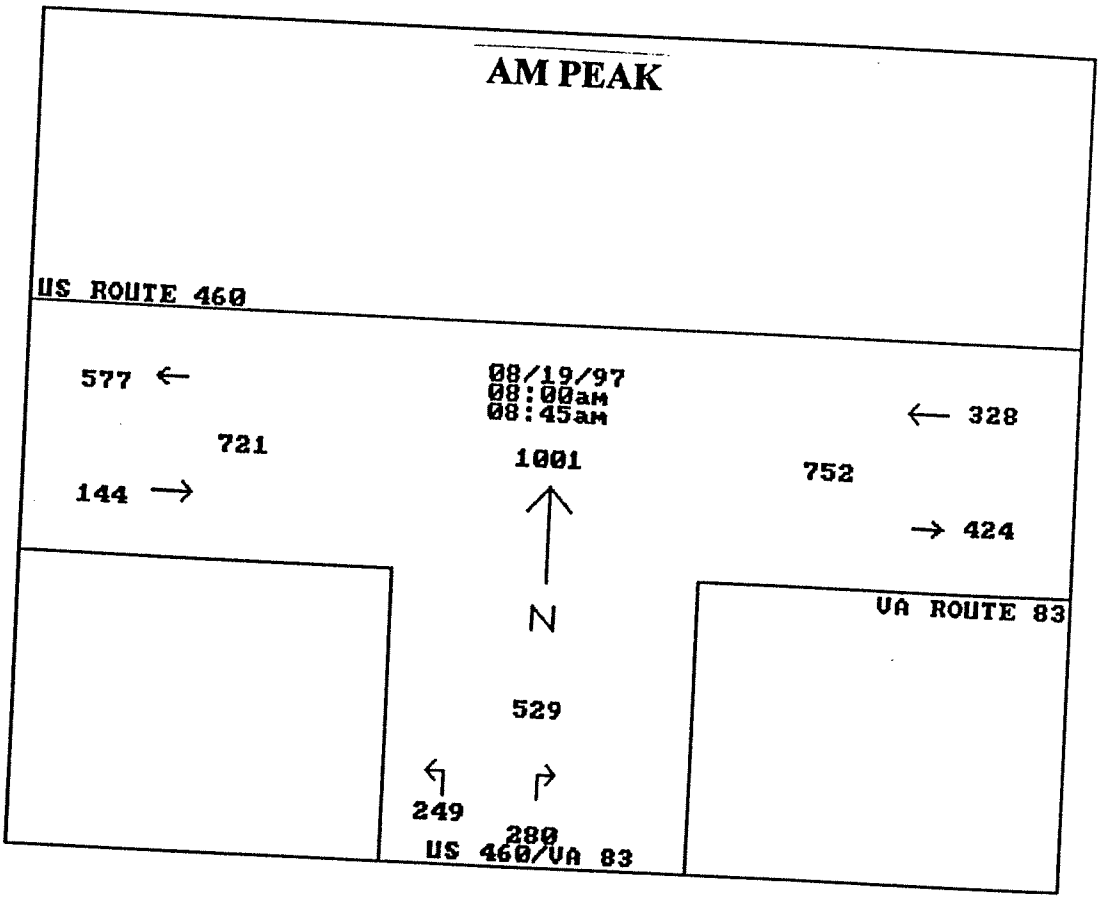
Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	US 460/VA 83 Northbound Left	Right	Other	US ROUTE 460 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97										
Time	08:00			08:00			08:00			
Vol.	0	328	0	249	280	0	144	0	0	
Pct.	0.0	100.0	0.0	47.0	52.9	0.0	100.0	0.0	0.0	
Total	328			529			144			
High	08:00			08:30			08:00			
Vol.	0	96	0	68	69	0	55	0	0	
Total	96			137			55			
PHF	0.854			0.965			0.654			



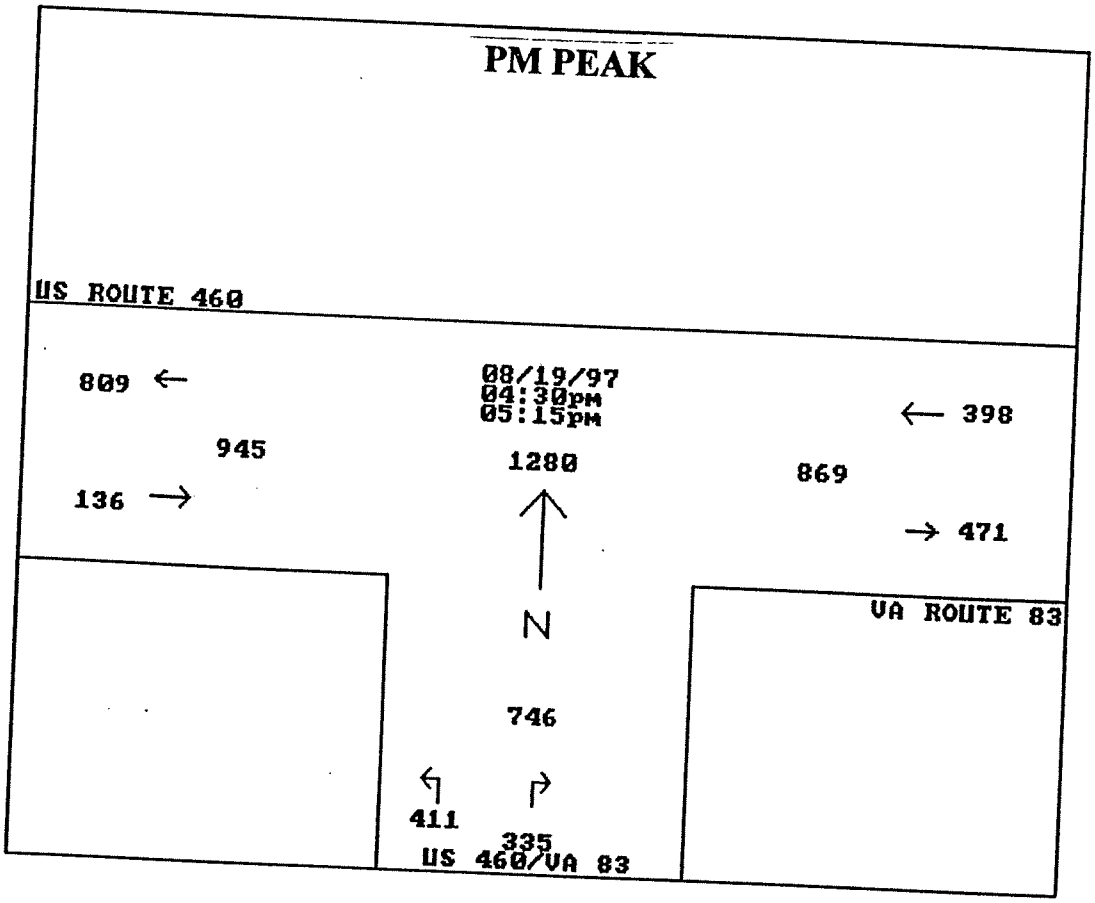
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0852
Location :M-5 (US 460/VA 83@ 83-GRUNDY)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Name
Site Code
Start Date
Page

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	US 460/VA 83 Northbound Left	Right	Other	US ROUTE 460 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	16:30			16:30			16:30			
Vol.	0	398	0	411	335	0	136	0	0	
Pct.	0.0	100.0	0.0	55.0	44.9	0.0	100.0	0.0	0.0	
Total	398			746			136			
High	17:15			17:00			17:00			
Vol.	0	123	0	139	109	0	49	0	0	
Total	123			248			49			
PHF	0.808			0.752			0.693			



Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0852
Location :M-5 (US 460/VA 83@ 83-GRUNDY)

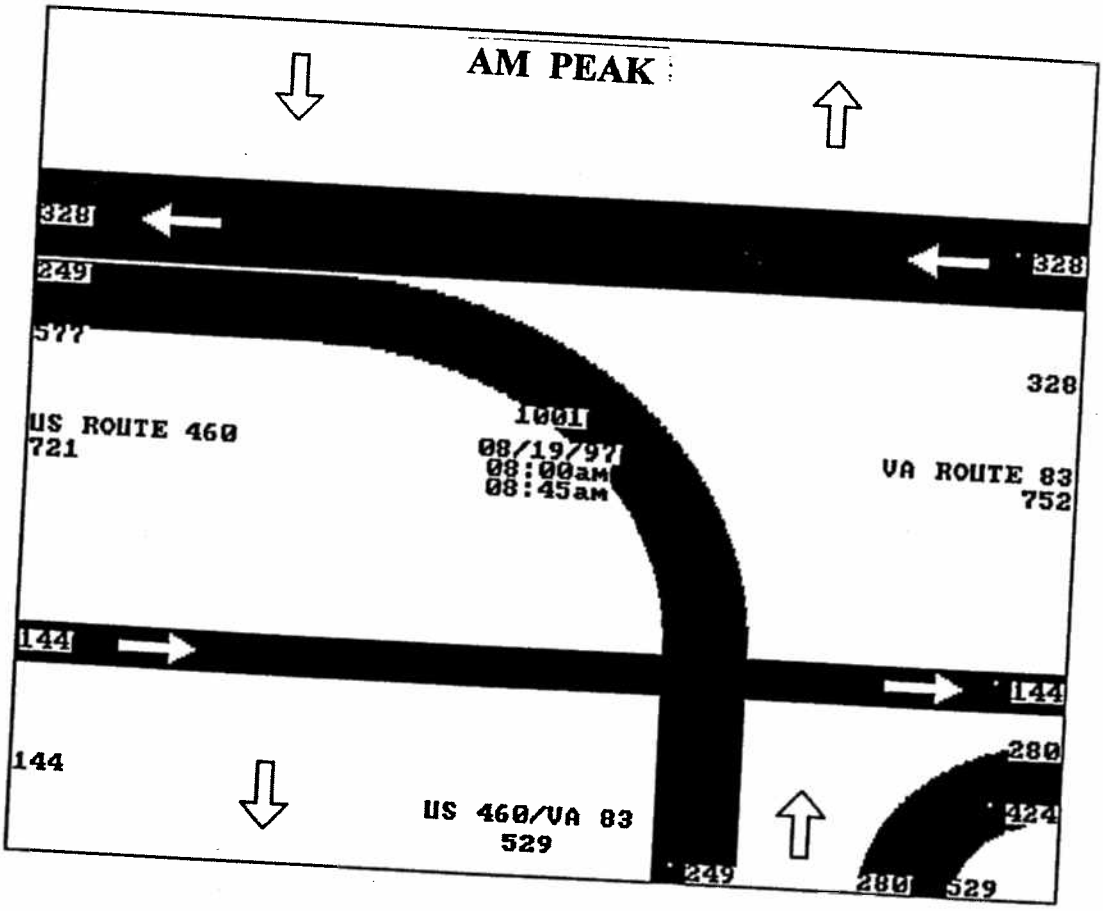
COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Nam
Site Code
Start Dat
Page

Vehicle group 1

Peak Hour Analysis By Entire Intersection for the Period: 08:00 on 08/19/97 to 10:45 on 08/19/97

Time	08:00			08:00			08:00		
Vol.	0	328	0	249	280	0	144	0	0
Pct.	0.0	100.0	0.0	47.0	52.9	0.0	100.0	0.0	0.0
Total	328			529			144		
High	08:00			08:30			08:00		
Vol.	0	96	0	68	69	0	55	0	0
Total	96			137			55		
PHF	0.854			0.965			0.654		



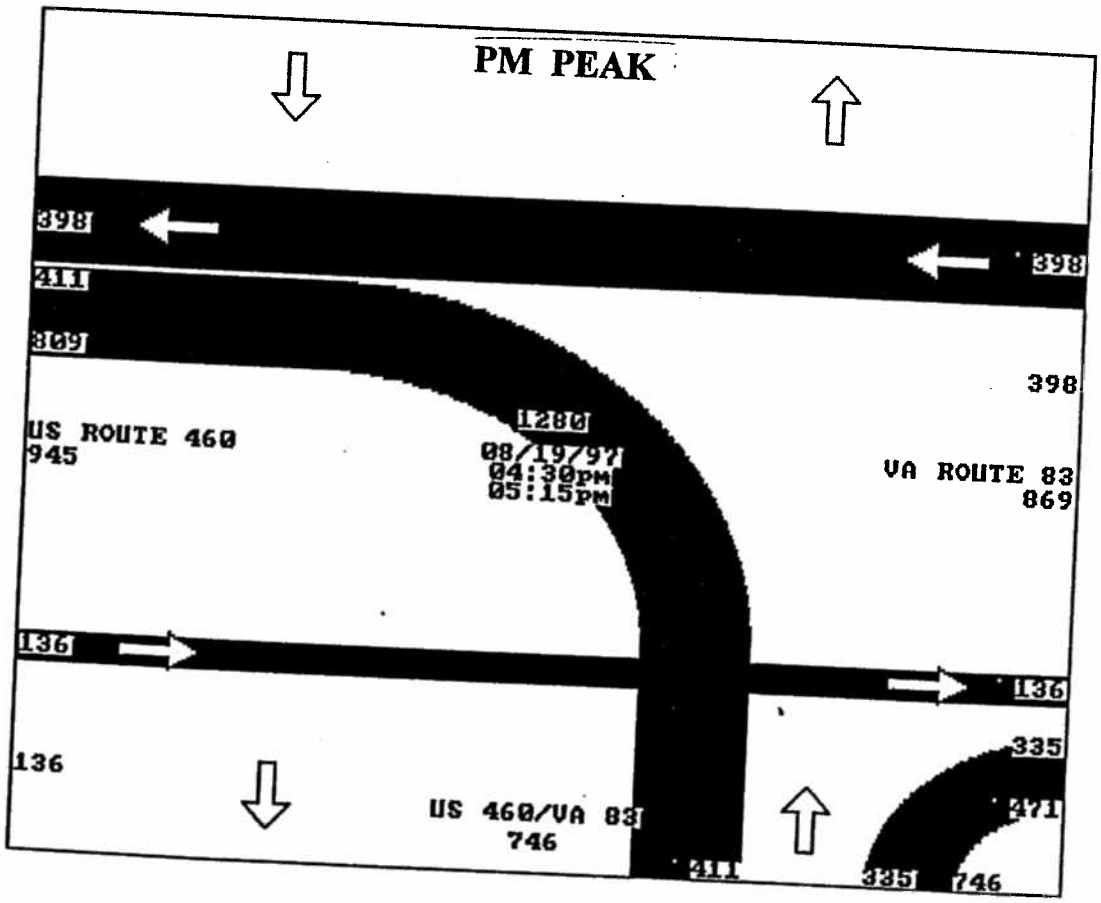
Weather :SUNNY/DRY
Counted by:CHI ASSOC.
Board # :D1-0852
Location :M-5 (US 460/VA 83@ 83-GRUNDY)

COAL FIELDS EXPRESSWAY
TURNING MOVEMENT COUNTS
CHI ASSOCIATES, INC.

Study Nam
Site Code
Start Dat
Page

Vehicle group 1

Start Time	VA ROUTE 83 Westbound Left	Thru	Other	US 460/VA 83 Northbound Left	Right	Other	US ROUTE 460 Eastbound Thru	Right	Other	Intrvl. Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 on 08/19/97 to 17:45 on 08/19/97										
Time	16:30			16:30			16:30			
Vol.	0	398	0	411	335	0	136	0	0	
Pct.	0.0	100.0	0.0	55.0	44.9	0.0	100.0	0.0	0.0	
Total	398			746			136			
High	17:15			17:00			17:00			
Vol.	0	123	0	139	109	0	49	0	0	
Total	123			248			49			
PHF	0.808			0.752			0.693			



APPENDIX C

VIDEO SURVEILLANCE COUNT DATA

Monday, August 18, 1997

	US 23 Northbound		US 23 Southbound		VA 83 Westbound		
	through	right turn	left turn	through	left turn	right turn	total
7:15	7	30	16	10	31	20	114
7:30	10	35	23	20	60	17	165
7:45	13	27	34	31	60	24	189
8:00	14	18	50	35	20	48	185
8:15	22	8	37	32	46	24	169
8:30	21	14	23	37	39	19	153
8:45	26	31	17	26	29	29	158
9:00	18	29	15	33	37	11	143
9:15	28	23	14	22	41	16	144
9:30	20	30	21	25	21	17	134
9:45	26	32	10	30	21	18	137
10:00	23	38	14	25	49	17	166
10:15	24	21	13	16	18	20	112
10:30	27	31	18	33	47	23	179
10:45	30	31	20	23	33	16	153
11:00	30	37	19	38	30	16	170
11:15	29	37	16	29	33	10	154
11:30	31	37	17	29	38	21	173
11:45	40	39	16	31	22	13	161
12:00	27	42	23	35	41	21	189
12:15	33	30	20	32	28	19	162
12:30	32	37	17	30	31	21	168
12:45	34	33	19	30	13	18	147
13:00	35	30	21	43	34	18	181
13:15	30	31	11	29	37	28	166
13:30	34	41	19	31	36	17	178
13:45	31	42	16	32	23	16	160
14:00	40	41	27	37	16	23	184
14:15	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0
14:45	24	30	24	23	22	14	137
15:00	27	40	31	30	31	14	173
15:15	37	52	58	41	36	11	235
15:30	36	39	27	35	57	23	217
15:45	32	57	30	32	33	20	204
16:00	39	56	25	18	18	18	174
16:15	41	58	38	33	36	28	234
16:30	35	64	26	38	31	16	210
16:45	40	66	35	41	40	24	246
17:00	48	55	28	47	34	36	248
17:15	42	65	28	39	20	18	212
17:30	51	60	25	35	30	22	223
17:45	40	50	29	33	17	29	198
18:00	43	42	25	44	17	22	193
18:15	34	49	18	38	37	18	194
18:30	33	62	18	47	41	28	229
18:45	43	42	24	27	37	21	194
19:00	31	42	25	24	36	32	190
total	1411	1804	1080	1449	1507	954	8205

AM Peak 7:30-8:30, 708 vehs
PM Peak 16:15-17:15, 938 vehs

Monday, August 18, 1997

	VA83 Eastbound			VA83 Westbound			SR631 Northbound			SR631 Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	total
7:30	3	61	2	7	98	6	1	0	0	25	3	9	215
7:45	8	124	9	5	93	26	0	1	2	25	4	16	313
8:00	19	76	3	2	110	27	1	0	0	15	1	14	268
8:15	6	68	0	2	86	13	0	0	1	14	0	9	199
8:30	17	80	0	1	96	8	0	0	3	17	0	13	235
8:45	7	78	0	1	60	10	2	0	2	15	0	6	181
9:00	9	38	0	0	74	11	0	1	0	14	1	14	162
9:15	10	79	1	2	89	11	0	0	0	21	1	10	224
9:30	5	72	0	0	76	11	0	0	1	13	1	11	190
9:45	4	87	0	1	96	12	1	0	2	15	0	12	230
10:00	6	82	0	3	98	16	0	0	1	20	1	10	237
10:15	7	71	0	1	88	9	0	1	2	17	0	20	216
10:30	3	78	0	1	100	14	0	0	0	24	0	4	224
10:45	9	71	0	2	68	12	1	0	0	20	0	9	192
11:00	16	83	0	0	83	12	0	0	1	21	0	16	232
11:15	3	87	2	1	91	15	1	0	0	27	0	10	237
11:30	10	86	0	0	77	16	2	0	2	19	0	10	222
11:45	11	84	1	2	101	8	4	0	0	16	0	11	238
12:00	14	91	1	1	109	8	2	1	1	18	0	8	254
12:15	8	89	2	1	103	18	0	0	0	14	0	15	250
12:30	12	91	0	0	91	9	0	1	1	9	0	14	228
12:45	7	83	0	3	111	8	0	0	0	15	0	11	238
13:00	6	103	0	0	86	10	2	0	2	12	0	6	227
13:15	4	71	0	1	95	12	0	1	1	13	0	14	212
13:30	3	103	0	1	102	8	2	0	7	19	0	9	254
13:45	5	96	0	2	83	9	1	0	1	18	0	14	229
14:00	9	97	0	0	92	9	1	1	1	7	0	14	231
14:15	6	85	0	0	79	12	1	0	0	20	0	10	213
14:30	6	104	1	1	99	5	2	0	1	13	0	13	245
14:45	8	92	0	1	99	8	1	0	2	11	0	8	230
15:00	9	112	1	4	129	15	10	5	12	12	0	8	317
15:15	14	97	1	4	112	20	2	2	0	10	1	9	272
15:30	8	116	1	2	105	8	3	0	0	6	1	13	263
15:45	11	129	0	1	105	18	0	1	0	15	0	14	294
16:00	10	119	1	4	81	13	3	0	1	21	1	9	263
16:15	6	118	0	2	126	12	1	1	2	11	0	10	289
16:30	8	114	1	1	100	15	2	0	2	31	0	15	289
16:45	8	111	0	3	98	14	1	0	3	18	0	6	262
17:00	9	119	1	1	120	16	3	1	1	15	0	16	302
17:15	8	127	2	3	124	16	6	0	1	13	0	8	305
17:30	26	111	2	7	93	12	0	1	0	14	0	17	283
17:45	14	120	5	4	88	10	3	0	4	19	0	7	274
18:00	13	86	0	7	99	9	3	0	4	8	0	13	242
18:15	12	86	2	2	73	11	5	3	6	15	1	8	224
18:30	14	99	2	4	85	15	11	2	7	12	1	12	264
18:45	7	79	1	4	74	8	3	1	3	13	0	8	201
19:00	6	97	2	4	73	9	4	2	1	9	0	7	214
19:15	8	102	0	2	78	7	2	1	0	8	9	8	225
total	**432**	**4452**	**44**	**101**	**4493**	**581**	**87**	**27**	**81**	**757**	**26**	**528**	**11609**

AM Peak 7:45-8:45, 1015 vehs
PM Peak 17:00-18:00, 1164 vehs

Monday, August 18, 1997

	VA 63 Northbound		VA 83 Eastbound		VA 83 Westbound		
	left turn	right turn	through	right turn	left turn	through	total
7:45	23	20	26	19	9	26	123
8:00	19	6	10	16	15	29	95
8:15	17	9	12	5	11	31	85
8:30	24	7	13	20	5	21	90
8:45	12	5	14	3	8	19	61
9:00	20	14	20	10	0	0	64
9:15	14	7	25	13	10	6	75
9:30	22	12	13	16	2	16	81
9:45	10	10	16	14	11	24	85
10:00	13	8	16	13	6	16	72
10:15	12	6	17	11	11	22	79
10:30	14	5	23	12	5	14	73
10:45	15	17	7	11	16	26	92
11:00	3	5	15	18	6	22	69
11:15	18	19	17	17	6	25	102
11:30	10	13	32	19	9	26	109
11:45	13	3	21	22	8	20	87
12:00	4	6	18	5	8	25	66
12:15	13	8	23	16	8	19	87
12:30	9	11	10	9	6	22	67
12:45	13	12	17	18	11	24	95
13:00	5	8	17	18	8	10	66
13:15	8	9	2	1	6	14	40
13:30	12	15	21	19	5	23	95
13:45	4	7	26	21	10	33	101
14:00	14	10	22	12	10	19	87
14:15	10	3	24	13	5	17	72
14:30	15	13	18	18	7	18	89
14:45	11	8	17	19	13	52	120
15:00	15	9	15	14	12	39	104
15:15	20	16	18	18	8	22	102
15:30	13	20	23	16	9	22	103
15:45	16	9	31	19	4	17	96
16:00	14	4	23	18	11	19	89
16:15	17	11	26	19	7	18	98
16:30	15	16	22	18	3	22	96
16:45	14	10	28	28	9	31	120
17:00	15	9	27	16	5	17	89
17:15	15	12	29	20	8	12	96
17:30	17	16	18	9	10	14	84
17:45	25	10	22	22	7	12	98
18:00	21	7	25	17	4	13	87
18:15	23	6	17	14	8	17	85
18:30	8	6	12	9	1	8	44
18:45	14	9	16	10	7	9	65
19:00	8	6	12	9	1	15	51
19:15	10	10	11	9	4	13	57
19:30	10	8	12	9	1	14	54
total	667	470	899	702	354	953	4045

AM Peak 7:45-8:45, 393 vehs
PM Peak 14:45-15:45, 429 vehs

Thursday, August 21, 1997

	VA 83 Northbound		US460/VA83 Eastbound		US 460 Westbound		
	left turn	right turn	through	right turn	left turn	through	total
7:30	83	23	46	26	34	73	285
7:45	111	20	65	30	28	88	342
8:00	92	19	56	36	19	91	313
8:15	101	46	56	36	16	75	330
8:30	72	30	63	51	22	69	307
8:45	65	43	34	45	32	75	294
9:00	39	44	61	43	25	50	262
9:15	65	43	61	41	24	60	294
9:30	56	33	44	50	20	72	275
9:45	48	47	71	54	34	55	309
10:00	49	51	63	56	32	62	313
10:15	48	45	67	42	17	53	272
10:30	44	48	68	37	27	80	304
10:45	47	29	49	48	28	82	283
11:00	50	43	74	48	30	60	305
11:15	43	36	82	69	41	90	361
11:30	56	41	60	56	44	86	343
11:45	29	33	76	61	38	64	301
12:00	23	33	82	55	35	91	319
12:15	48	38	86	68	29	82	351
12:30	12	34	86	53	32	88	305
12:45	12	36	83	59	27	75	292
13:00	29	27	71	51	31	60	269
13:15	48	33	66	56	35	65	303
13:30	39	43	84	56	32	83	337
13:45	32	32	71	45	30	72	282
14:00	45	40	78	59	42	33	297
14:15	54	50	94	56	53	87	394
14:30	43	44	90	53	54	91	375
14:45	40	50	89	56	41	84	360
15:00	55	40	94	79	39	87	394
15:15	34	34	82	71	48	83	352
15:30	67	33	87	89	35	85	396
15:45	44	38	101	91	39	84	397
16:00	58	51	94	69	46	79	397
16:15	46	43	87	65	51	82	374
16:30	61	47	87	80	51	91	417
16:45	52	37	83	99	40	99	410
17:00	55	51	107	24	52	90	379
17:15	61	35	67	81	114	167	525
17:30	50	37	73	77	46	85	368
17:45	69	30	61	49	39	72	320
18:00	51	22	56	55	43	62	289
18:15	39	28	55	60	48	67	297
18:30	45	23	61	55	30	63	277
18:45	39	16	57	61	31	54	258
19:00	54	14	42	52	32	41	235
19:15	23	17	32	52	28	48	200
total	2426	1730	3402	2705	1764	3635	15662

AM Peak 11:15-12:15, 1324 vehs
PM Peak 16:30-17:30, 1731 vehs

Wednesday, August 20 and Thursday, August 21, 1997

	SR 643 Southbound		VA 83 Eastbound		VA 83 Westbound		
	left turn	right turn	left turn	through	through	right turn	total
8:00	6	15	4	28	43	3	99
8:15	17	2	6	24	31	2	82
8:30	3	17	10	10	28	1	69
8:45	8	10	7	6	27	0	58
9:00	3	4	7	7	18	1	40
9:15	4	10	6	9	15	3	47
9:30	2	17	6	10	14	1	50
9:45	3	8	2	12	23	4	52
10:00	6	10	7	12	14	0	49
10:15	2	7	7	10	15	0	41
10:30	4	7	9	11	11	3	45
10:45	5	11	9	11	16	2	54
11:00	4	6	7	3	10	0	30
11:15	2	7	8	8	16	1	42
11:30	4	8	10	10	10	2	44
11:45	1	10	15	12	10	2	50
12:00	1	11	7	12	10	5	46
12:15	1	16	12	13	14	1	57
12:30	6	9	4	12	12	1	44
12:45	4	5	14	12	15	5	55
13:00	2	11	7	14	19	1	54
13:15	4	13	15	10	17	0	59
13:30	4	8	13	10	17	3	55
13:45	6	6	9	15	19	3	58
14:00	5	17	16	20	12	1	71
14:15	3	9	9	17	17	4	59
14:30	1	15	11	12	10	4	53
14:45	8	11	12	25	16	6	78
15:00	2	6	16	23	17	3	67
15:15	6	18	9	19	9	2	63
15:30	5	12	12	27	21	5	82
15:45	5	11	6	13	24	3	62
16:00	6	19	18	29	11	4	87
16:15	3	5	5	24	12	8	57
16:30	5	13	13	17	13	6	67
16:45	6	7	17	18	15	6	69
17:00	3	4	11	35	14	4	71
17:15	6	4	17	27	16	8	78
17:30	2	9	20	21	8	4	64
17:45	7	3	10	21	11	2	54
18:00	1	14	9	15	10	5	54
18:15	1	8	13	15	8	5	50
18:30	1	12	9	18	14	7	61
18:45	5	7	8	16	15	3	54
19:00	4	4	4	16	3	4	35
19:15	0	2	11	15	6	4	38
19:30	2	4	8	14	11	2	41
19:45	3	3	4	13	4	3	30
total	192	445	469	751	721	147	2725

AM Peak 8:00-9:00, 308 vehs
PM Peak 15:15-16:15, 294 vehs

Saturday, August 16, 1997

	Park Entrance		VA 80 Northbound		VA 80 Southbound		
	left turn	right turn	left turn	through	through	right turn	total
8:00	1	2	2	2	2	3	12
8:15	3	1	0	3	6	2	15
8:30	2	3	3	5	5	1	19
8:45	3	2	2	5	3	5	20
9:00	2	2	0	3	8	0	15
9:15	1	3	1	4	2	3	14
9:30	1	1	0	6	4	2	14
9:45	5	1	3	2	4	2	17
10:00	7	1	9	4	5	5	31
10:15	2	1	3	2	9	6	23
10:30	9	4	7	5	6	10	41
10:45	2	2	6	6	9	6	31
11:00	3	5	13	3	8	10	42
11:15	4	2	9	2	6	13	36
11:30	2	3	9	6	3	15	38
11:45	1	0	4	7	6	10	28
12:00	3	1	7	5	8	5	29
12:15	4	3	8	6	7	13	41
12:30	1	5	6	8	9	20	49
12:45	4	4	6	3	19	20	56
13:00	6	4	2	6	7	5	30
13:15	9	4	11	9	2	19	54
13:30	6	5	4	4	10	14	43
13:45	8	7	7	9	4	13	48
14:00	5	7	8	10	10	14	54
14:15	7	3	3	6	5	10	34
14:30	17	4	7	6	6	5	45
14:45	9	5	1	6	2	12	35
15:00	14	11	3	4	11	8	51
15:15	14	1	2	3	8	4	32
15:30	9	9	6	3	5	2	34
15:45	5	1	5	3	10	13	37
16:00	13	10	4	8	10	6	51
16:15	24	9	0	8	4	4	49
16:30	11	2	1	4	2	2	22
16:45	2	8	3	5	4	6	28
17:00	11	9	6	13	7	12	58
17:15	8	7	10	6	4	9	44
17:30	5	10	1	9	7	10	42
17:45	13	7	6	9	9	17	61
18:00	10	4	7	7	9	20	57
18:15	14	6	6	5	12	7	50
18:30	10	4	8	5	6	17	50
18:45	4	2	18	5	5	18	52
19:00	12	4	7	6	10	9	48
19:15	7	5	6	6	5	7	36
19:30	6	1	6	3	0	6	22
total	**313**	**189**	**241**	**245**	**290**	**414**	**1692**

AM Peak 10:30-11:30, 150 vehs
PM Peak 17:45-18:45, 218 vehs

Saturday, August 16, 1997

	VA80 Northbound		VA 80 Southbound		SR 609 Westbound		
	through	right turn	left turn	through	left turn	right turn	total
8:00	1	0	2	4	1	2	10
8:15	4	0	3	4	0	3	14
8:30	7	0	3	3	0	1	14
8:45	7	0	2	5	4	1	19
9:00	13	0	6	5	4	7	35
9:15	2	0	4	9	0	2	17
9:30	4	0	3	3	0	6	16
9:45	5	0	0	4	0	4	13
10:00	10	0	2	7	0	3	22
10:15	14	0	5	12	0	4	35
10:30	8	1	2	14	1	2	28
10:45	4	0	4	6	0	4	18
11:00	3	0	2	15	0	2	22
11:15	4	0	1	14	0	3	22
11:30	6	0	3	17	0	5	31
11:45	8	0	2	8	1	4	23
12:00	7	0	4	10	0	6	27
12:15	7	0	3	14	1	6	31
12:30	7	0	6	23	0	5	41
12:45	6	0	7	23	0	5	41
13:00	9	0	9	18	1	8	45
13:15	10	0	7	16	0	7	40
13:30	6	0	10	13	0	5	34
13:45	13	0	0	12	0	1	26
14:00	12	1	3	13	0	5	34
14:15	5	0	3	15	0	8	31
14:30	15	0	0	11	0	6	32
14:45	9	0	5	15	0	5	34
15:00	9	0	6	9	0	6	30
15:15	12	0	3	10	0	7	32
15:30	6	0	4	10	0	4	24
15:45	5	0	2	15	0	3	25
16:00	15	0	4	10	0	6	35
16:15	17	0	3	9	0	4	33
16:30	10	0	5	6	0	6	27
16:45	18	0	2	7	0	3	30
17:00	19	0	2	12	1	3	37
17:15	8	0	1	13	0	3	25
17:30	14	0	7	18	0	1	40
17:45	11	1	6	15	1	4	38
18:00	11	0	3	17	0	5	36
18:15	10	0	1	13	0	1	25
18:30	10	1	7	16	0	8	42
18:45	5	0	2	17	0	4	28
19:00	11	0	5	13	0	6	35
19:15	9	0	5	10	1	4	29
19:30	4	1	5	7	0	7	24
19:45	8	1	4	10	0	6	29
total	406	6	170	539	15	205	1341

AM Peak 11:15-12:15, 112 vehs
PM Peak 12:15-13:15, 167 vehs

Friday, August 15, 1997

	SR 609 Eastbound		US 460 Eastbound		US 460 Westbound		
	left turn	right turn	through	right turn	left turn	through	total
8:45	10	31	65	0	1	39	146
9:00	4	22	39	6	10	28	109
9:15	7	20	50	15	8	26	126
9:30	4	19	44	5	6	31	109
9:45	7	19	48	4	14	32	124
10:00	5	32	44	7	13	37	138
10:15	6	11	41	10	16	34	118
10:30	11	21	34	7	14	40	127
10:45	8	21	63	10	13	44	159
11:00	3	12	50	10	18	21	114
11:15	5	24	54	5	18	35	141
11:30	6	17	44	31	24	48	170
11:45	9	21	37	5	13	51	136
12:00	4	21	57	9	47	27	165
12:15	13	31	40	17	17	43	161
12:30	12	26	46	4	19	46	153
12:45	8	26	45	9	24	40	152
13:00	13	12	39	10	22	47	143
13:15	10	18	58	8	16	51	161
13:30	3	23	40	11	22	52	151
13:45	9	27	49	7	17	45	154
14:00	11	26	50	8	12	56	163
14:15	3	26	50	9	24	41	153
14:30	18	6	48	10	15	78	175
14:45	4	22	36	14	15	44	135
15:00	4	23	48	9	12	46	142
15:15	7	13	78	0	21	64	183
15:30	6	18	56	8	36	50	174
15:45	4	26	69	7	25	67	198
16:00	7	31	36	10	30	61	175
16:15	9	29	50	5	24	42	159
16:30	8	26	37	6	54	32	163
16:45	3	14	50	6	28	52	153
17:00	1	26	52	6	21	79	185
17:15	7	23	62	1	28	78	199
17:30	7	17	45	8	15	59	151
17:45	10	19	35	6	22	61	153
18:00	2	12	29	8	23	40	114
18:15	12	28	28	6	25	46	145
18:30	6	14	31	2	13	34	100
18:45	5	10	22	4	20	32	93
19:00	6	12	19	2	13	29	81
19:15	2	12	21	6	16	43	100
19:30	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0
20:30	0	0	0	0	41	0	41
total	**299**	**887**	**1939**	**331**	**885**	**1951**	**6292**

AM Peak 11:15-12:15, 632 vehs
PM Peak 15:00-16:00, 730 vehs

APPENDIX D

VEHICLE CLASSIFICATION COUNT DATA

V-4 trucks

Thursday, August 21, 1997

	VA 83/80 Northbound		VA 63 Eastbound		VA 83/80 Westbound		
	left turn	right turn	through	right turn	left turn	through	total
8:00	3	5	0	0	9	0	17
9:00	3	7	1	1	6	1	19
10:00	1	6	2	2	4	2	17
11:00	2	11	0	1	7	2	23
12:00	5	10	1	2	15	2	35
13:00	6	9	2	2	12	1	32
14:00	0	14	1	7	14	0	36
15:00	4	7	0	4	7	0	22
16:00	1	6	0	4	16	0	27
17:00	0	4	0	4	3	0	11
18:00	2	5	0	0	0	0	7
19:00	0	1	0	0	0	0	1
total	**27**	**85**	**7**	**27**	**93**	**8**	**247**

V-3 trucks

Monday, August 18, 1997

	VA 63 Northbound		VA 83 Eastbound		VA 83 Westbound		
	left turn	right turn	through	right turn	left turn	through	total
8:00	10	8	10	10	16	9	63
9:00	16	24	6	0	12	12	70
10:00	10	13	11	0	12	12	58
11:00	11	11	7	0	12	12	53
12:00	12	17	1	0	12	12	54
13:00	10	8	10	0	12	12	52
14:00	9	15	4	0	12	12	52
15:00	15	4	7	0	12	12	50
16:00	9	8	0	0	12	12	41
17:00	7	7	0	0	12	12	38
18:00	8	6	0	0	12	12	38
total	**117**	**121**	**56**	**10**	**136**	**129**	**569**

V-6 trucks

Wednesday, August 20, 1997

	VA 460 Eastbound		VA 460 Westbound		
	through	right turn	left turn	through	total
8:00	3	8	9	22	**42**
9:00	8	9	20	17	**54**
10:00	4	13	32	16	**65**
11:00	4	17	20	24	**65**
12:00	2	15	15	19	**51**
13:00	2	14	20	18	**54**
14:00	2	24	18	19	**63**
15:00	1	22	18	23	**64**
16:00	5	15	14	15	**49**
17:00	2	9	10	9	**30**
18:00	3	4	5	9	**21**
19:00	0	4	3	9	**16**
total	**36**	**154**	**184**	**200**	**574**

V-5 trucks

Thursday, August 21, 1997

	VA 83 Northbound		US460/VA83 Eastbound		US 460 Westbound		
	left turn	right turn	through	right turn	left turn	through	total
8:00	6	10	24	5	15	48	**108**
9:00	5	12	37	10	8	38	**110**
10:00	3	24	30	5	16	44	**122**
11:00	6	25	36	6	18	33	**124**
12:00	6	15	38	6	14	35	**114**
13:00	2	19	42	4	16	33	**116**
14:00	8	15	52	8	13	39	**135**
15:00	5	7	47	18	12	32	**121**
16:00	6	14	32	8	17	31	**108**
17:00	2	5	25	10	10	20	**72**
18:00	2	3	14	5	8	17	**49**
total	**51**	**149**	**377**	**85**	**147**	**370**	**1179**

V-8 trucks

Saturday, August 16, 1997

	Park Entrance		VA 80 Northbound		VA 80 Southbound		
	left turn	right turn	left turn	through	through	right turn	total
8:00	2	1	0	0	0	5	8
9:00	2	0	0	0	0	2	4
10:00	4	0	0	0	0	2	6
11:00	3	1	0	0	0	3	7
12:00	0	0	0	0	1	0	1
13:00	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0
total	**11**	**2**	**0**	**0**	**1**	**12**	**26**

V-7 trucks

Wednesday, August 20 and Thursday, August 21, 1997

	SR 643 Southbound		VA 83 Eastbound		VA 83 Westbound		
	left turn	right turn	left turn	through	through	right turn	total
8:00	0	2	5	3	3	0	13
9:00	0	1	0	1	2	5	9
10:00	1	0	0	1	0	0	2
11:00	0	0	2	0	0	0	2
12:00	1	1	0	0	4	1	7
13:00	3	3	2	0	2	0	10
14:00	1	3	1	4	2	1	12
15:00	0	3	1	4	5	1	14
16:00	0	3	1	0	1	1	6
17:00	0	3	1	0	0	0	4
18:00	0	0	1	0	0	0	1
19:00	1	0	0	0	0	0	1
total	**7**	**19**	**14**	**13**	**19**	**9**	**81**

V-10 trucks

Friday, August 15, 1997

	SR 609 SB		US 460 Eastbound		US 460 Westbound		
	left turns	right turns	through	right turns	left turns	through	total
9:00	9	5	24	14	5	18	75
10:00	14	4	23	6	6	30	83
11:00	11	5	19	9	4	24	72
12:00	10	5	29	9	4	21	78
13:00	11	1	26	10	4	21	73
14:00	7	6	15	10	1	25	64
15:00	7	6	25	6	4	28	76
16:00	5	1	13	8	4	10	41
17:00	5	3	15	4	3	11	41
18:00	0	0	3	3	0	5	11
19:00	0	0	1	0	0	0	1
total	**79**	**36**	**193**	**79**	**35**	**193**	**615**

V-9 trucks

Saturday, August 16, 1997

	VA80 Northbound		VA 80 Southbound		SR 609 Westbound		
	through	right turn	left turn	through	left turn	right turn	total
8:00	0	0	0	6	0	0	6
9:00	2	0	0	4	0	0	6
10:00	2	0	0	3	0	0	5
11:00	1	0	0	4	0	0	5
12:00	0	0	1	1	0	0	2
13:00	0	0	1	0	0	0	1
14:00	0	0	0	0	0	0	0
15:00	0	0	0	1	0	0	1
16:00	0	0	0	0	0	1	1
17:00	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0
total	**5**	**0**	**2**	**19**	**0**	**1**	**27**

APPENDIX E

TRAVEL TIME DATA

#	Road	Segment	Distance (miles)	Travel Time (seconds) AM (8-11)	MID (11-3)	PM (3-7)	Average	Speed (mph)
1	US 23	VA 634 to US 23 Bus. (South)	3.4	234	235 238	233	235.000	52.1
2	US 23 Bus.	US 23 to VA 83	1.8	212 174 164	168 199	174	181.833	35.6
3	US 23 Bus.	VA 83 to US 23	1.2	137 144	150	157 146	146.800	29.4
4	US 23	US 23 Bus. South to US 23 Bus. North	2.4		167 164 166	160 167	164.800	52.4
5	US 23	US 23 Bus. North to VA 630	0.9	63 70	60 60	70 64	64.500	50.2
6	US 23	VA 630 to US 119	3.5	303 315	286	280 311	299.000	42.1
7	VA 83	US 23 Bus. to VA 853	2.9	227 229	248 268	237 500 235	277.714	37.6
8	VA 83	VA 853 to VA 72	4.3	285 322	290 305	324 340	311.000	49.8
9	VA 83	VA 72 to VA 631	1.5	105 120	152	164 132 160	138.833	38.9
10	VA 83	VA 631 to VA 63 south	6.5	605	745 759	598 605 624	656.000	35.7
11	VA 83	VA 63 south to VA 63 north	4.8	393 419	388 435	396 427	409.667	42.2
12	VA 83	VA 63 north to VA 80 south	6.1	483 520	460	502 510 522	499.500	44.0
13	VA 83	VA 80 south to VA 80 north	1.5	175 174		134 163 200 181	171.167	31.5
14	VA 83	VA 80 north to VA 604	5.7	774 600	636 594	608 602	635.667	32.3
15	VA 83	VA 604 to US 460	7.7	840 730	718 786	756 808	773.000	35.9
16	VA 83/US 460	US 460 to VA 83	4.2	434	445 472	520 435 462	461.333	32.8
17	VA 83	US 460 to VA 642	4.8	450 435	433 433 485	500 440	453.714	34.1

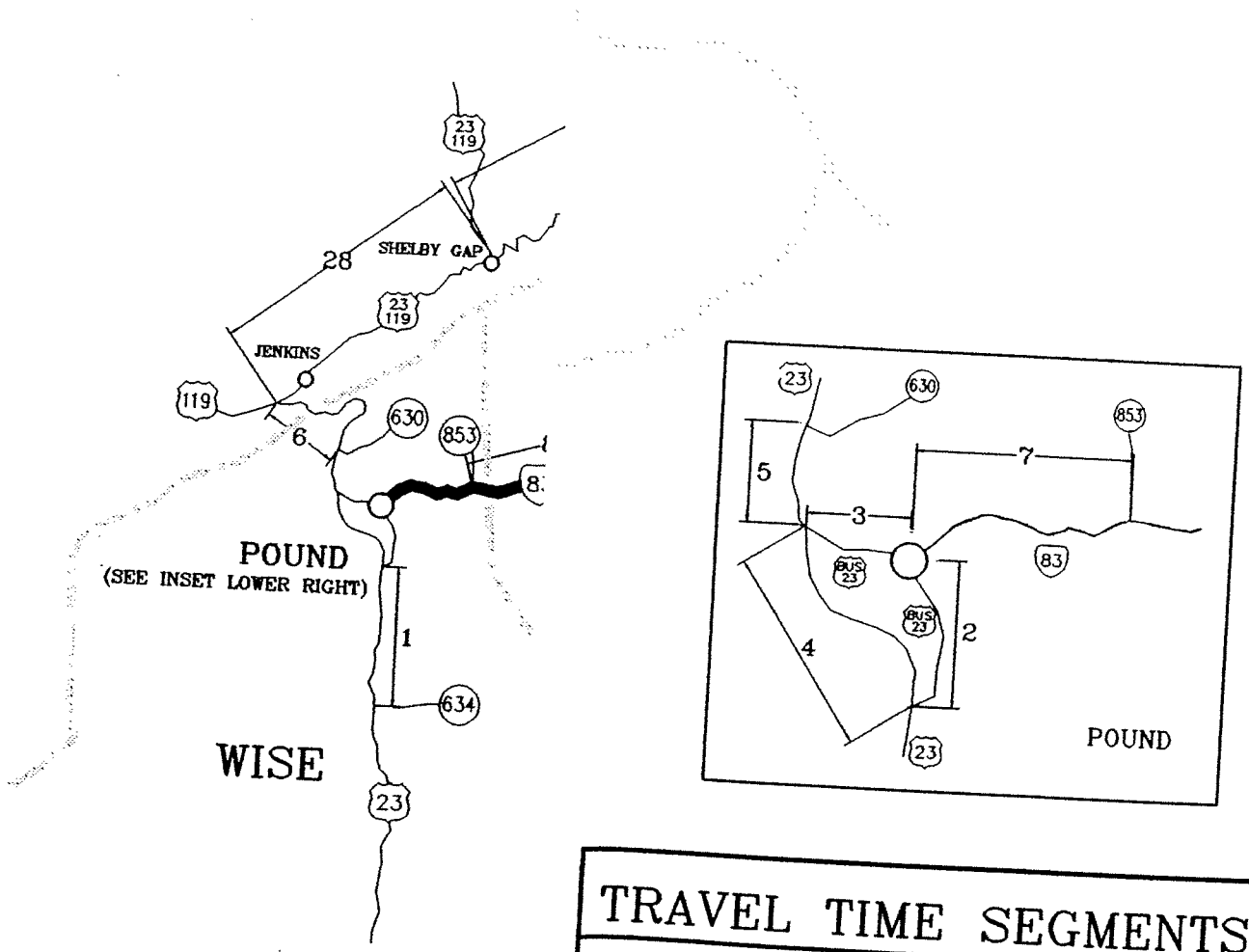
#	Road	Segment	Distance (miles)	Travel Time (seconds) AM (8-11)	MID (11-3)	PM (3-7)	Average	Speed (mph)
18	VA 83	VA 642 to VA 643	4.2	380	370 385	374 375	376.800	40.1
19	VA 83	VA 643 to State Line	6.9		674 765 745	676	715.000	34.7
20	US 460	VA 83 to VA 638	4.0			315 293 313	307.000	46.9
21	US 460	VA 638 to VA 624	3.6			298 270 317	295.000	43.9
22	US 460	VA 624 to VA 680	3.7			268 268 298	278.000	47.9
23	US 460	VA 83 to VA 609	5.8	542		589 491 485	526.750	39.6
24	US 460	VA 609 to KY 80	17.6	1372 1292		1414	1359.333	46.6
25	KY 80	US 460 to KY 197	3.1	293 292 377		276	309.500	36.1
26	KY 197	KY 80 to KY 195	5.6	690 616	675	639	655.000	30.8
27	KY 197	KY 195 to US 23	9.5	880 962 850	821 826	835	862.333	39.7
28	US 23	KY 197 to US 119	6.6	750 830	771 797	790	787.600	30.2
29	VA 72	VA 83 to VA 665	4.9		500 513		506.500	34.8
30	VA 63	VA 83 to VA 652	3.7			360 359	359.500	37.1
31	VA 80	VA 83 to VA 670	2	210		190 196	198.667	36.2
32	VA 80	VA 83 to VA 609	8	778	802 894	813 850	827.400	34.8
33	VA 80	VA 609 to KY 197	5.5	540 535		579	551.333	35.9
34	VA 609	VA 80 to US 460	9.5	1019 1015 1030		1079 990 1056	1031.500	33.2

COALFIELDS EXP

Project No. R000-961-10

From: US 23 at Pound

To: West Virginia State Li



TRAVEL TIME SEGMENTS

BELLOMO-McGEE, INC. BMI

8330 Boone Boulevard-Suite 700
Vienna, Virginia 22182
703 / 847-3071

Appendix E

Approx. Scale:
1" = 4.5 miles

APPENDIX F

LOS WORKSHEETS FOR EXISTING CONDITIONS ANALYSIS

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T7
ANALYST..... AJN
TIME OF ANALYSIS..... 3:15 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	5
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.76
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	60 / 40
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.99	.87
B	5	3.4	3.9	.85	.99	.83
C	5	3.4	3.9	.85	.99	.83
D	5	2.9	3.3	.85	.99	.83
E	5	2.9	3.3	.92	.99	.83

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 351
ACTUAL FLOW RATE: 462

LOS	SERVICE FLOW RATE	V/C
A	61	.03
B	255	.13
C	550	.28
D	844	.43
E	1913	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T1
ANALYST..... AJN
TIME OF ANALYSIS..... 4:15 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	4
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.9
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	54 / 46
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.98	.89
B	5	3.4	3.9	.85	.98	.86
C	5	3.4	3.9	.85	.98	.86
D	5	2.9	3.3	.85	.98	.86
E	5	2.9	3.3	.92	.98	.86

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 216
ACTUAL FLOW RATE: 240

LOS	SERVICE FLOW RATE	V/C
A	62	.03
B	260	.13
C	561	.28
D	861	.43
E	1951	.9

LOS FOR GIVEN CONDITIONS: B

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T2
ANALYST..... AJN
TIME OF ANALYSIS..... 3:00 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	4
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.86
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	46 / 54
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.98	.89
B	5	3.4	3.9	.85	.98	.86
C	5	3.4	3.9	.85	.98	.86
D	5	2.9	3.3	.85	.98	.86
E	5	2.9	3.3	.92	.98	.86

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 699
ACTUAL FLOW RATE: 813

LOS	SERVICE FLOW RATE	V/C
A	62	.03
B	260	.13
C	561	.28
D	861	.43
E	1951	.9

LOS FOR GIVEN CONDITIONS: D

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T3
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	4
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.93
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	62 / 38
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.93	.89
B	5	3.4	3.9	.85	.93	.86
C	5	3.4	3.9	.85	.93	.86
D	5	2.9	3.3	.85	.93	.86
E	5	2.9	3.3	.92	.93	.86

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 459
ACTUAL FLOW RATE: 494

LOS	SERVICE FLOW RATE	V/C
A	59	.03
B	248	.13
C	534	.28
D	820	.43
E	1859	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T4
ANALYST..... AJN
TIME OF ANALYSIS..... 3:45 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	12
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.91
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	61 / 39
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.94	.74
B	5	3.4	3.9	.85	.94	.68
C	5	3.4	3.9	.85	.94	.68
D	5	2.9	3.3	.85	.94	.68
E	5	2.9	3.3	.92	.94	.68

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 292
ACTUAL FLOW RATE: 321

LOS	SERVICE FLOW RATE	V/C
A	49	.03
B	195	.13
C	421	.28
D	647	.43
E	1465	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T5
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	6
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.8
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	34 / 66
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.91	.85
B	5	3.4	3.9	.85	.91	.81
C	5	3.4	3.9	.85	.91	.81
D	5	2.9	3.3	.85	.91	.81
E	5	2.9	3.3	.92	.91	.81

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 244
ACTUAL FLOW RATE: 305

LOS	SERVICE FLOW RATE	V/C
A	55	.03
B	227	.13
C	489	.28
D	751	.43
E	1701	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T6
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	8
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.89
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	52 / 48
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.99	.81
B	5	3.4	3.9	.85	.99	.76
C	5	3.4	3.9	.85	.99	.76
D	5	2.9	3.3	.85	.99	.76
E	5	2.9	3.3	.92	.99	.76

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 1159
ACTUAL FLOW RATE: 1302

LOS	SERVICE FLOW RATE	V/C
A	57	.03
B	232	.13
C	499	.28
D	766	.43
E	1735	.9

LOS FOR GIVEN CONDITIONS: E

HCS: Multilane Highways Release 2.3d

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

File Name T8.HC7
Facility Section..... T8 -- VA 460
From/To.....
Analyst..... AJN
Time of Analysis..... 4:15 pm peak hour
Date of Analysis..... 11/03/97
Other Information....

A. Geometrics and Traffic Input	Direction 1	Direction 2
Volume	464	399
Peak-Hour Factor or Peak 15 Minutes	0.93	0.88
Number of Lanes	2	2
Percentage of Trucks and Buses	4	4
Percentage of Recreational Vehicles	0	0
Ideal Free-Flow Speed (mph)	50.0	50.0
Type of Median	U	U
Lane Width (ft)	11.0	11.0
Distance from Roadway Edge (ft)	3.0	3.0
Access Points per Mile	20.0	20.0

B. Adjustment Factors

	Terrain Type	E T	E R	F HV	F M	F LW	F LC	F A
Dir 1	ROLLING	3.00		0.93	1.60	1.90	0.65	5.00
Dir 2		3.00		0.93	1.60	1.90	0.65	5.00

C. Level of Service Results	Direction 1	Direction 2
Service Flow Rate (Vp)	269	245
Free Flow Speed (mph)	40.9	40.9
Average Passenger Car Speed (mph)	40.9	40.9
Density (pcpmpl)	6.6	6.0
Level of Service (LOS)	A	A

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T-14
ANALYST..... AJN
TIME OF ANALYSIS..... 3:30 peak hour
DATE OF ANALYSIS..... 10-31-97
OTHER INFORMATION.... 460 West of Grundy

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	5
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.84
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	52 / 48
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	4	3	3.2	.85	.99	.87
B	5	3.4	3.9	.85	.99	.83
C	5	3.4	3.9	.85	.99	.83
D	5	2.9	3.3	.85	.99	.83
E	5	2.9	3.3	.92	.99	.83

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 789
ACTUAL FLOW RATE: 939

LOS	SERVICE FLOW RATE	V/C
A	61	.03
B	255	.13
C	549	.28
D	843	.43
E	1909	.9

LOS FOR GIVEN CONDITIONS: E

Center For Microcomputers In Transportation
University of Florida
Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 23 (E-W) 83
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/2/97
Other Information.....4:15-5:15 pm
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes		164	243	127	159					141		104
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0						0	
MC's (%)				0						0		0
SU/RV's (%)				0						0		0
CV's (%)				2						2		2
PCE's				1.02						1.02		1.02

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	301	
Potential Capacity: (pcph)	975	
Movement Capacity: (pcph)	975	
Prob. of Queue-Free State:	0.89	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	429	
Potential Capacity: (pcph)	1071	
Movement Capacity: (pcph)	1071	
Prob. of Queue-Free State:	0.87	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.86	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	602	
Potential Capacity: (pcph)	474	
Major LT, Minor TH Impedance Factor:	0.86	
Adjusted Impedance Factor:	0.86	
Capacity Adjustment Factor due to Impeding Movements	0.86	
Movement Capacity: (pcph)	407	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	151	407 >					
WB R	111	975 >	540	12.9	3.0	C	12.9
SB L	137	1071		3.9	0.5	A	1.7

Intersection Delay = 3.9 sec/veh

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Streets: (N-S) 23 (E-W) 83
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/2/97
Other Information.....7:30-8:30 am
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes		59	88	144	118					189		113
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0						0	
MC's (%)				0						0		0
SU/RV's (%)				0						0		0
CV's (%)				2						2		2
PCE's				1.02						1.02		1.02

Adjustment Factors

Vehicle Mover	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	108	
Potential Capacity: (pcph)	1221	
Movement Capacity: (pcph)	1221	
Prob. of Queue-Free State:	0.90	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	155	
Potential Capacity: (pcph)	1446	
Movement Capacity: (pcph)	1446	
Prob. of Queue-Free State:	0.89	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.88	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	384	
Potential Capacity: (pcph)	635	
Major LT, Minor TH Impedance Factor:	0.88	
Adjusted Impedance Factor:	0.88	
Capacity Adjustment Factor due to Impeding Movements	0.88	
Movement Capacity: (pcph)	562	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	203	562 >					
			704	9.5	2.8	B	9.5
WB R	121	1221 >					
SB L	155	1446		2.8	0.3	A	1.5

Intersection Delay = 4.6 sec/veh

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) 83 (N-S) 631
Analyst: AJN File Name: V2-1.HC9
Area Type: Other 10-2-97 5:00 hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<		> 1	<	1	1	<
Volumes	57	477	10	15	422	54	12	2	6	61	1	48
PHF or PK15	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Lane W (ft)	12.0	12.0		12.0	12.0			12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
Parking	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Arr Type	3	3		3	3			3		3	3	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	35.0P							
Yellow/AR	5.0							

	5	6	7	8
NB Left	*	*		
Thru	*	*		
Right	*	*		
Peds				
SB Left		*		
Thru		*		
Right		*		
Peds				
EB Right				
WB Right				
Green	5.0P	10.0P		
Yellow/AR	0.0	5.0		

Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	163	264	0.369	0.617	5.0	A	4.9	A
	TR	1112	1804	0.461	0.617	4.9	A		
WB	L	153	248	0.105	0.617	3.6	A	4.8	A
	TR	1097	1779	0.457	0.617	4.9	A		
NB	LTR	395	1394	0.053	0.283	11.9	B	11.9	B
SB	L	321	1603	0.200	0.200	15.2	C	15.2	C
	TR	309	1543	0.169	0.200	15.1	C		

Intersection Delay = 6.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.333

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

eets: (E-W) 83 (N-S) 631
lyst: AJN File Name: V2-2.HC9
Area Type: Other 10-2-97 7:45 hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<		> 1	<	1	1	<
Volumes	50	348	12	10	385	74	1	1	6	71	5	52
PHF or PK15	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Lane W (ft)	12.0	12.0		12.0	12.0			12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
Parking	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Arr Type	3	3		3	3			3		3	3	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	35.0P				5.0P	10.0P		
Yellow/AR	5.0				0.0	5.0		

NB Left	*	*					
Thru	*	*					
Right	*	*					
Peds							
SB Left		*					
Thru		*					
Right		*					
Peds							
EB Right							
WB Right							

Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	178	289	0.297	0.617	4.4	A	4.3	A
	TR	1110	1800	0.341	0.617	4.3	A		
WB	L	325	527	0.034	0.617	3.4	A	4.8	A
	TR	1089	1766	0.444	0.617	4.8	A		
NB	LTR	400	1411	0.020	0.283	11.8	B	11.8	B
SB	L	335	1675	0.224	0.200	15.3	C	15.3	C
	TR	312	1561	0.192	0.200	15.2	C		

Intersection Delay = 6.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.310

Center For Microcomputers In Transportation
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Ph: (904) 392-0378

Streets: (N-S) 63 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....2:45 - 3:45 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		73	67	42	135		59		53			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				12			23		23			
PCE's				1.12			1.23		1.23			

Adjustment Factors

Vehicle euver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	112	
Potential Capacity: (pcph)	1215	
Movement Capacity: (pcph)	1215	
Prob. of Queue-Free State:	0.94	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	148	
Potential Capacity: (pcph)	1457	
Movement Capacity: (pcph)	1457	
Prob. of Queue-Free State:	0.97	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.96	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	298	
Potential Capacity: (pcph)	712	
Major LT, Minor TH Impedance Factor:	0.96	
Adjusted Impedance Factor:	0.96	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	686	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	76	686 >	865	5.0	0.7	A	5.0
NB R	69	1215 >					
WB L	49	1457		2.6	0.0	A	0.6

Intersection Delay = 1.6 sec/veh

Center For Microcomputers In Transportation
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[illegible]inesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 63 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....4:00 - 5:00 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		99	83	30	90		60		41			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				12			23		23			
PCE's				1.12			1.23		1.23			

Adjustment Factors

Vehicle [illegible]neuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	148	
Potential Capacity: (pcph)	1165	
Movement Capacity: (pcph)	1165	
Prob. of Queue-Free State:	0.95	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	191	
Potential Capacity: (pcph)	1390	
Movement Capacity: (pcph)	1390	
Prob. of Queue-Free State:	0.97	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.97	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	274	
Potential Capacity: (pcph)	735	
Major LT, Minor TH Impedance Factor:	0.97	
Adjusted Impedance Factor:	0.97	
Capacity Adjustment Factor due to Impeding Movements	0.97	
Movement Capacity: (pcph)	715	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	77	715 >					
NB R	53	1165 >	849	5.0	0.6	B	5.0
WB L	36	1390		2.7	0.0	A	0.7

Intersection Delay = 1.5 sec/veh

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University of Florida
Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 80/83 (E-W) 80/83/63
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....2:15 - 3:15 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		100	86	122	118		67		141			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				4			8		8			
PCE's				1.04			1.08		1.08			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	150	
Potential Capacity: (pcph)	1162	
Movement Capacity: (pcph)	1162	
Prob. of Queue-Free State:	0.86	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	196	
Potential Capacity: (pcph)	1383	
Movement Capacity: (pcph)	1383	
Prob. of Queue-Free State:	0.90	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.90	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	402	
Potential Capacity: (pcph)	620	
Major LT, Minor TH Impedance Factor:	0.90	
Adjusted Impedance Factor:	0.90	
Capacity Adjustment Factor due to Impeding Movements	0.90	
Movement Capacity: (pcph)	556	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	77	556 >	858	5.8	1.3	B	5.8
NB R	160	1162 >					
WB L	133	1383		2.9	0.3	A	1.5

Intersection Delay = 2.5 sec/veh

Center For Microcomputers In Transportation
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Ph: (904) 392-0378

Streets: (N-S) 80/83 (E-W) 80/83/63
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....4:00 - 5:00 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		80	64	180	114		52		83			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				4			8		8			
PCE's				1.04			1.08		1.08			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	118	
Potential Capacity: (pcph)	1207	
Movement Capacity: (pcph)	1207	
Prob. of Queue-Free State:	0.92	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	151	
Potential Capacity: (pcph)	1453	
Movement Capacity: (pcph)	1453	
Prob. of Queue-Free State:	0.86	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.85	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	426	
Potential Capacity: (pcph)	600	
Major LT, Minor TH Impedance Factor:	0.85	
Adjusted Impedance Factor:	0.85	
Capacity Adjustment Factor due to Impeding Movements	0.85	
Movement Capacity: (pcph)	512	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	59	512 >					
NB R	94	1207 >	792	5.6	0.8	B	5.6
WB L	197	1453		2.9	0.5	A	1.8

Intersection Delay = 2.2 sec/veh

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: AJN File Name: V5-1.HC9
Area Type: Other 10-1-97 4:30 hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1		1		1			
Volumes		344	287	257	447		229		170			
PHF or PK15		0.95	0.95	0.95	0.95		0.95		0.95			
Lane W (ft)		12.0	12.0	12.0	12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		5	5	10	10		8		8			
Parking	(Y/N) N			(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					0
Arr Type		3	3	3	3		3		3			
RTOR Vols			20			0			20			
Lost Time		3.00	3.00	3.00	3.00		3.00		3.00			
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	36.0P							
Yellow/AR	5.0							

NB	Left	*
	Thru	
	Right	*
	Peds	
SB	Left	
	Thru	
	Right	
	Peds	
EB	Right	
WB	Right	
Green		14.0P
Yellow/AR		5.0

Cycle Length: 60 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	1146	1810	0.316	0.633	3.9	A	3.8	A
	R	974	1538	0.288	0.633	3.8	A		
WB	L	421	664	0.644	0.633	7.5	B	5.5	B
	T	1094	1727	0.431	0.633	4.4	A		
NB	L	446	1671	0.541	0.267	15.4	C	14.9	B
	R	399	1495	0.396	0.267	14.1	B		

Intersection Delay = 7.0 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.614

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: AJN File Name: V5-2.HC9
Area Type: Other 10-1-97 3:30 hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1		1		1			
Volumes		369	314	171	330		215		165			
PHF or PK15		0.95	0.95	0.95	0.95		0.95		0.95			
Lane W (ft)		12.0	12.0	12.0	12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		5	5	10	10		8		8			
Parking	(Y/N) N			(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					0
Arr Type		3	3	3	3		3		3			
RTOR Vols			20			0			15			
Lost Time		3.00	3.00	3.00	3.00		3.00		3.00			
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	36.0P							
Yellow/AR	5.0							

NB	Left	*
	Thru	
	Right	*
	Peds	
SB	Left	
	Thru	
	Right	
	Peds	
EB	Right	
WB	Right	
Green		14.0P
Yellow/AR		5.0

Cycle Length: 60 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	1146	1810	0.338	0.633	4.0	A	3.9	A
	R	974	1538	0.318	0.633	3.9	A		
WB	L	395	624	0.455	0.633	4.9	A	4.2	A
	T	1094	1727	0.317	0.633	3.9	A		
NB	L	446	1671	0.507	0.267	15.0	B	14.6	B
	R	399	1495	0.396	0.267	14.1	B		

Intersection Delay = 6.6 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.471

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) 460 (N-S) 83
Analyst: AJN File Name: V6-1.HC9
Area Type: Other 10-2-97 3:30 hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1							
Volumes		114	265	154	410							
PHF or PK15		0.95	0.95	0.95	0.95							
Lane W (ft)		12.0	12.0	12.0	12.0							
Grade		0			0							
% Heavy Veh		5	5	5	5							
Parking	(Y/N) N			(Y/N) N								
Bus Stops			0			0						
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N								
Arr Type		3	3	3	3							
RTOR Vols			0			0						
Lost Time		3.00	3.00	3.00	3.00							
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru		*						
Right		*						
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	30.0P	20.0P						
Yellow/AR	5.0	5.0						

NB Left, Thru, Right, Peds; SB Left, Thru, Right, Peds; EB Right; WB Right; Green; Yellow/AR

Cycle Length: 60 secs Phase combination order: #1 #2

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	664	1810	0.181	0.367	9.8	B	11.2	B
	R	564	1538	0.495	0.367	11.8	B		
WB	L	917	1719	0.177	0.533	5.5	B	6.4	B
	T	965	1810	0.448	0.533	6.8	B		

Intersection Delay = 8.3 sec/veh Intersection LOS = B

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.467

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) 460 (N-S) 83
Analyst: AJN File Name: V6-2.HC9
Area Type: Other 10-2-97 11:30hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1							
Volumes		98	265	139	407							
PHF or PK15		0.95	0.95	0.95	0.95							
Lane W (ft)		12.0	12.0	12.0	12.0							
Grade		0			0							
% Heavy Veh		5	5	5	5							
Parking	(Y/N) N			(Y/N) N								
Bus Stops			0			0						
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N								
Arr Type		3	3	3	3							
RTOR Vols			0			0						
Lost Time		3.00	3.00	3.00	3.00							
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru		*						
Right		*						
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	30.0P	20.0P						
Yellow/AR	5.0	5.0						

NB Left, Thru, Right, Peds
SB Left, Thru, Right, Peds
EB Right
WB Right
Green
Yellow/AR

Cycle Length: 60 secs Phase combination order: #1 #2

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	664	1810	0.155	0.367	9.7	B	11.2	B
	R	564	1538	0.495	0.367	11.8	B		
WB	L	917	1719	0.159	0.533	5.4	B	6.4	B
	T	965	1810	0.443	0.533	6.7	B		

Intersection Delay = 8.3 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.464

Center For Microcomputers In Transportation
University of Florida
Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 83 (E-W) 643
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....8:00 - 9:00 am
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	1	1	0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes		129	6	27	68							
PHF		.95	.95	.95	.95					34		44
Grade		0			0					.95		.95
MC's (%)				0							0	
SU/RV's (%)				0						0		0
CV's (%)				2						0		0
PCE's				1.02						3		3
										1.03		1.03

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	139	
Potential Capacity: (pcph)	1177	
Movement Capacity: (pcph)	1177	
Prob. of Queue-Free State:	0.96	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	142	
Potential Capacity: (pcph)	1467	
Movement Capacity: (pcph)	1467	
Prob. of Queue-Free State:	0.98	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	239	
Potential Capacity: (pcph)	770	
Major LT, Minor TH Impedance Factor:	0.98	
Adjusted Impedance Factor:	0.98	
Capacity Adjustment Factor due to Impeding Movements	0.98	
Movement Capacity: (pcph)	755	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	37	755 >	944	4.2	0.2	A	4.2
WB R	47	1177 >					
SB L	29	1467		2.5	0.0	A	0.7

Intersection Delay = 1.3 sec/veh

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Streets: (N-S) 83 (E-W) 643
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....3:15 - 4:15 pm
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	1	1	0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes		65	14	45	88					22		60
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0						0	
MC's (%)				0						0		0
SU/RV's (%)				0						0		0
CV's (%)				2						3		3
PCE's				1.02						1.03		1.03

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	76	
Potential Capacity: (pcph)	1267	
Movement Capacity: (pcph)	1267	
Prob. of Queue-Free State:	0.95	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	83	
Potential Capacity: (pcph)	1565	
Movement Capacity: (pcph)	1565	
Prob. of Queue-Free State:	0.97	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	216	
Potential Capacity: (pcph)	794	
Major LT, Minor TH Impedance Factor:	0.97	
Adjusted Impedance Factor:	0.97	
Capacity Adjustment Factor due to Impeding Movements	0.97	
Movement Capacity: (pcph)	770	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	24	770 >					
WB R	65	1267 >	1079	3.6	0.2	A	3.6
SB L	48	1565		2.4	0.0	A	0.8

Intersection Delay = 1.4 sec/veh

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Ph: (904) 392-0378

Streets: (N-S) 80 (E-W) Park Entrance
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....5:45 - 6:45 pm
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes	27	26			36	61	47		21			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)							0		0			
SU/RV's (%)							0		0			
CV's (%)							2		2			
PCE's	1.10						1.02		1.02			

Adjustment Factors

[illegible]icle [illegible]euver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		70
Movement Capacity: (pcph)		1276
Prob. of Queue-Free State:		1276
		0.98

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		102
Movement Capacity: (pcph)		1533
Prob. of Queue-Free State:		1533
		0.98

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		125
Major LT, Minor TH Impedance Factor:		896
Adjusted Impedance Factor:		0.98
Capacity Adjustment Factor due to Impeding Movements		0.98
Movement Capacity: (pcph)		0.98
		878

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	50	878		4.3	0.0	A	
EB R	22	1276		2.9	0.0	A	3.9
NB L	31	1533		2.4	0.0	A	1.2

Intersection Delay = 1.5 sec/veh

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Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 80 (E-W) Park Entrance
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....1:15 - 2:15 pm
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes	30	32			26	60	28		23			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)							0		0			
SU/RV's (%)							0		0			
CV's (%)							2		2			
PCE's	1.10						1.02		1.02			

Adjustment Factors

[illegible]icle [illegible]neuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		58
Potential Capacity: (pcph)		1294
Movement Capacity: (pcph)		1294
Prob. of Queue-Free State:		0.98

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		90
Potential Capacity: (pcph)		1553
Movement Capacity: (pcph)		1553
Prob. of Queue-Free State:		0.98

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		124
Potential Capacity: (pcph)		897
Major LT, Minor TH Impedance Factor:		0.98
Adjusted Impedance Factor:		0.98
Capacity Adjustment Factor due to Impeding Movements		0.98
Movement Capacity: (pcph)		877

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	30	877		4.3	0.0	A	
EB R	24	1294		2.8	0.0	A	3.6
NB L	35	1553		2.4	0.0	A	1.1

Intersection Delay = 1.3 sec/veh

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Streets: (N-S) 609 (E-W) 80
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....12:30 - 1:30 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes	29	80			32	0						
PHF	.95	.95			.95	.95				1		25
Grade		0			0					.95		.95
MC's (%)											0	
SU/RV's (%)										0		0
CV's (%)										0		0
PCE's	1.10									10		10
										1.10		1.10

Adjustment Factors

hicle heuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		34
Movement Capacity: (pcph)		1331
Prob. of Queue-Free State:		1331
		0.98

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		34
Movement Capacity: (pcph)		1652
Prob. of Queue-Free State:		1652
TH Saturation Flow Rate: (pcphpl)		0.98
RT Saturation Flow Rate: (pcphpl)		1700
Major LT Shared Lane Prob. of Queue-Free State:		0.98

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		149
Major LT, Minor TH Impedance Factor:		868
Adjusted Impedance Factor:		0.98
Capacity Adjustment Factor due to Impeding Movements		0.98
Movement Capacity: (pcph)		0.98
		849

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
SB L	1	849 >					
SB R	29	1331 >	1306	2.8	0.0	A	2.8
EB L	34	1652		2.2	0.0	A	0.6

Intersection Delay = 0.8 sec/veh

HCS: Unsignalized Intersections Release 2.1d V9-2.HCO Page 1

Center For Microcomputers In Transportation
University of Florida
512 Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 609 (E-W) 80
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....5:45 - 6:45pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes	17	61			42	2				1		18
PHF	.95	.95			.95	.95				.95		.95
Grade		0			0						0	
MC's (%)										0		0
SU/RV's (%)										0		0
CV's (%)										10		10
PCE's	1.10									1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)		45
Potential Capacity: (pcph)		1314
Movement Capacity: (pcph)		1314
Prob. of Queue-Free State:		0.98

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)		46
Potential Capacity: (pcph)		1630
Movement Capacity: (pcph)		1630
Prob. of Queue-Free State:		0.99
TH Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.99

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)		127
Potential Capacity: (pcph)		894
Major LT, Minor TH Impedance Factor:		0.99
Adjusted Impedance Factor:		0.99
Capacity Adjustment Factor due to Impeding Movements		0.99
Movement Capacity: (pcph)		883

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
SB L	1	883 >					
SB R	21	1314 >	1285	2.9	0.0	A	2.9
EB L	20	1630		2.2	0.0	A	0.5

Intersection Delay = 0.7 sec/veh

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University of Florida
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[illegible]nesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 460 (E-W) 609
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....3:00 - 4:00 pm
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	112	242			239	25	24		88			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)	0						0		0			
SU/RV's (%)	0						0		0			
CV's (%)	1						0		0			
PCE's	1.01						1.00		1.00			

Adjustment Factors

Vehicle [illegible]euver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		265
Movement Capacity: (pcph)		1016
Prob. of Queue-Free State:		1016
		0.91

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		278
Movement Capacity: (pcph)		1264
Prob. of Queue-Free State:		1264
		0.91

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		638
Major LT, Minor TH		452
Impedance Factor:		
Adjusted Impedance Factor:		0.91
Capacity Adjustment Factor due to Impeding Movements		0.91
Movement Capacity: (pcph)		0.91
		409

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	25	409 >					
EB R	93	1016 >	773	5.5	0.6	B	5.5
NB L	119	1264		3.1	0.3	A	1.0

Intersection Delay = 1.3 sec/veh

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University of Florida
Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 460 (E-W) 609
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....4:30 - 5:30 pm
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	136	241			201	19	19		89			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)	0						0		0			
SU/RV's (%)	0						0		0			
CV's (%)	1						0		0			
PCE's	1.01						1.00		1.00			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		222
Movement Capacity: (pcph)		1069
Prob. of Queue-Free State:		1069
		0.91

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		232
Movement Capacity: (pcph)		1329
Prob. of Queue-Free State:		1329
		0.89

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		619
Major LT, Minor TH		464
Impedance Factor:		
Adjusted Impedance Factor:		0.89
Capacity Adjustment Factor due to Impeding Movements		0.89
Movement Capacity: (pcph)		0.89
		414

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	20	414 >					
EB R	94	1069 >	837	5.0	0.5	A	5.0
NB L	144	1329		3.0	0.3	A	1.1

Intersection Delay = 1.3 sec/veh

Center For Microcomputers In Transportation
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Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 72 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....3:00 - 4:00 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	1	1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		228	45	103	221		52		119			
PHF		.95	.95	.95	.95		.95		.95			
Grade		4			-4			0				
MC's (%)				0			0					
SU/RV's (%)				0			0					
CV's (%)				5			5					
PCE's				0.82			1.05		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	264	
Potential Capacity: (pcph)	1018	
Movement Capacity: (pcph)	1018	
Prob. of Queue-Free State:	0.86	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	287	
Potential Capacity: (pcph)	1251	
Movement Capacity: (pcph)	1251	
Prob. of Queue-Free State:	0.93	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	604	
Potential Capacity: (pcph)	473	
Major LT, Minor TH Impedance Factor:	0.93	
Adjusted Impedance Factor:	0.93	
Capacity Adjustment Factor due to Impeding Movements	0.93	
Movement Capacity: (pcph)	439	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	58	439 >					
NB R	138	1018 >	732	6.7	1.3	B	6.7
WB L	89	1251		3.1	0.1	A	1.0

Intersection Delay = 1.9 sec/veh

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Ph: (904) 392-0378

Streets: (N-S) 72 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....8:00 - 9:00 am
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	1	1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		141	32	52	166		38		88			
PHF		.95	.95	.95	.95		.95		.95			
Grade		4			-4			0				
MC's (%)				0			0					
SU/RV's (%)				0			0					
CV's (%)				5			5					
PCE's				0.82			1.05		1.10			

Adjustment Factors

Vehicle [illegible]uver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	165	
Potential Capacity: (pcph)	1142	
Movement Capacity: (pcph)	1142	
Prob. of Queue-Free State:	0.91	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	182	
Potential Capacity: (pcph)	1404	
Movement Capacity: (pcph)	1404	
Prob. of Queue-Free State:	0.97	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	395	
Potential Capacity: (pcph)	625	
Major LT, Minor TH Impedance Factor:	0.97	
Adjusted Impedance Factor:	0.97	
Capacity Adjustment Factor due to Impeding Movements	0.97	
Movement Capacity: (pcph)	605	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	42	605 >	907	4.7	0.6	A	4.7
NB R	102	1142 >					
WB L	45	1404		2.6	0.0	A	0.6

Intersection Delay = 1.4 sec/veh

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) 83 (N-S) 607/83
Analyst: AJN File Name: M2-1.HC9
Area Type: Other 10-1-97 4:30 hr

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1		1				1	1			1	1
Volumes	318		251				269	84			107	243
PHF or PK15	0.95		0.95				0.95	0.95			0.95	0.95
Lane W (ft)	12.0		12.0				12.0	12.0			12.0	12.0
Grade		0						0			0	
% Heavy Veh	5		2				2	2			2	5
Parking	(Y/N) N						(Y/N) Y		50	(Y/N) N		
Bus Stops			0						0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N						(Y/N) N			(Y/N) N		
Arr Type	3		3				3	3			3	3
RTOR Vols			100						0			100
Lost Time	3.00		3.00				3.00	3.00			3.00	3.00
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru								
Right	*							
Peds								
WB Left								
Thru								
Right								
Peds								
NB Right								
SB Right								
Green	26.0P				4.0P	20.0P		
Yellow/AR	5.0				0.0	5.0		

NB Left						*		
Thru						*		
Right								
Peds								
SB Left								
Thru					*	*		
Right					*	*		
Peds								
EB Right								
WB Right								

Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	L	802	1719	0.418	0.467	8.3	B	7.9	B
	R	739	1583	0.215	0.467	7.2	B		
NB	L	463	1264	0.611	0.367	13.5	B	12.6	B
	T	444	1211	0.198	0.367	9.9	B		
SB	T	807	1863	0.140	0.433	7.8	B	8.0	B
	R	666	1538	0.227	0.433	8.1	B		

Intersection Delay = 9.5 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.326

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

Streets: (E-W) 83 (N-S) 607/83
Analyst: AJN File Name: M2-2.HC9
Area Type: Other 10-1-97 9:45 hr

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1		1				1	1			1	1
Volumes	232		181				251	80			55	223
PHF or PK15	0.95		0.95				0.95	0.95			0.95	0.95
Lane W (ft)	12.0		12.0				12.0	12.0			12.0	12.0
Grade		0						0			0	
% Heavy Veh	5		2				2	2			2	5
Parking	(Y/N) N						(Y/N) Y		50	(Y/N) N		
Bus Stops			0						0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N						(Y/N) N			(Y/N) N		
Arr Type	3		3				3	3			3	3
RTOR Vols			60						0		100	
Lost Time	3.00		3.00				3.00	3.00			3.00	3.00
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru								
Right	*							
Peds								
WB Left								
Thru								
Right								
Peds								
NB Right								
SB Right								
Green	20.0P				6.0P	22.0P		
Yellow/AR	5.0				5.0	5.0		
NB Left						*		
NB Thru						*		
NB Right								
NB Peds								
SB Left								
SB Thru					*	*		
SB Right					*	*		
SB Peds								
EB Right								
WB Right								

Cycle Length: 63 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	L	600	1719	0.406	0.349	12.1	B	11.7	B
	R	553	1583	0.232	0.349	11.1	B		
NB	L	560	1470	0.471	0.381	11.7	B	11.2	B
	T	461	1211	0.182	0.381	9.9	B		
SB	T	1035	1863	0.056	0.556	4.9	A	5.1	B
	R	854	1538	0.152	0.556	5.2	B		

Intersection Delay = 10.2 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.250

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[illegible]nesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....3:30 - 4:30 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		121	106	40	106		83		63			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle [illegible]euver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	183	
Potential Capacity: (pcph)	1118	
Movement Capacity: (pcph)	1118	
Prob. of Queue-Free State:	0.94	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	239	
Potential Capacity: (pcph)	1319	
Movement Capacity: (pcph)	1319	
Prob. of Queue-Free State:	0.97	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.96	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	337	
Potential Capacity: (pcph)	676	
Major LT, Minor TH Impedance Factor:	0.96	
Adjusted Impedance Factor:	0.96	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	652	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	91	652 >					
NB R	69	1118 >	795	5.7	0.9	B	5.7
WB L	44	1319		2.8	0.0	A	0.8

Intersection Delay = 1.8 sec/veh

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Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....8:00 - 9:00 pm
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		85	70	47	85		67		31			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	126	
Potential Capacity: (pcph)	1195	
Movement Capacity: (pcph)	1195	
Prob. of Queue-Free State:	0.97	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	163	
Potential Capacity: (pcph)	1434	
Movement Capacity: (pcph)	1434	
Prob. of Queue-Free State:	0.96	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.96	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	264	
Potential Capacity: (pcph)	745	
Major LT, Minor TH Impedance Factor:	0.96	
Adjusted Impedance Factor:	0.96	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	717	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	75	717 >					
NB R	35	1195 >	822	5.1	0.5	B	5.1
WB L	51	1434		2.6	0.0	A	0.9

Intersection Delay = 1.6 sec/veh

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University of Florida
Weil Hall
Gainesville, FL 32611-2083
Ph: (904) 392-0378

Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....3:30 hour
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		64	72	20	103		79		6			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	105	
Potential Capacity: (pcph)	1225	
Movement Capacity: (pcph)	1225	
Prob. of Queue-Free State:	1.00	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	143	
Potential Capacity: (pcph)	1465	
Movement Capacity: (pcph)	1465	
Prob. of Queue-Free State:	0.98	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.98	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	234	
Potential Capacity: (pcph)	775	
Major LT, Minor TH Impedance Factor:	0.98	
Adjusted Impedance Factor:	0.98	
Capacity Adjustment Factor due to Impeding Movements	0.98	
Movement Capacity: (pcph)	763	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	87	763 >	782	5.2	0.4	B	5.2
NB R	6	1225 >					
WB L	22	1465		2.5	0.0	A	0.4

Intersection Delay = 1.4 sec/veh

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Weil Hall
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Ph: (904) 392-0378

Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... AJN
Date of Analysis..... 10/1/97
Other Information.....10:00 -11:00 am
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		37	72	6	49		64		5			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	77	
Potential Capacity: (pcph)	1266	
Movement Capacity: (pcph)	1266	
Prob. of Queue-Free State:	1.00	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	115	
Potential Capacity: (pcph)	1511	
Movement Capacity: (pcph)	1511	
Prob. of Queue-Free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	1.00	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	135	
Potential Capacity: (pcph)	884	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	880	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	70	880 >					
NB R	5	1266 >	898	4.4	0.2	A	4.4
WB L	6	1511		2.4	0.0	A	0.3

Intersection Delay = 1.4 sec/veh

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 11-24-1997
Center For Microcomputers In Transportation

ets: (E-W) 83/460 (N-S) 83
Analyst: AJN File Name: M5-1.HC9
Area Type: Other 10-1-97 4:30 hr

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		2			2		2		1			
Volumes		136			398		411		335			
PHF or PK15		0.95			0.95		0.95		0.95			
Lane W (ft)		12.0			12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		10			8		2		2			
Parking	(Y/N) Y		20	(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					0
Arr Type		3			3		3		3			
RTOR Vols			0			0			30			
Lost Time		3.00			3.00		3.00		3.00			
Prop. Share												
Prop. Prot.												

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right								
Peds								
WB Left								
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	23.0P							
Yellow/AR	5.0							

NB Left	*	
Thru		
Right	*	
Peds		
SB Left		
Thru		
Right		
Peds		
EB Right		
WB Right		
Green	32.0P	
Yellow/AR	5.0	

Cycle Length: 65 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	1196	3109	0.125	0.385	9.8	B	9.8	B
WB	T	1353	3519	0.325	0.385	10.7	B	10.7	B
NB	L	1851	3539	0.241	0.523	6.4	B	6.8	B
	R	828	1583	0.388	0.523	7.2	B		

Intersection Delay = 8.4 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.361

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	118	
Potential Capacity: (pcph)	1207	
Movement Capacity: (pcph)	1207	
Prob. of Queue-Free State:	0.92	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	151	
Potential Capacity: (pcph)	1453	
Movement Capacity: (pcph)	1453	
Prob. of Queue-Free State:	0.86	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.85	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	426	
Potential Capacity: (pcph)	600	
Major LT, Minor TH Impedance Factor:	0.85	
Adjusted Impedance Factor:	0.85	
Capacity Adjustment Factor due to Impeding Movements	0.85	
Movement Capacity: (pcph)	512	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	59	512 >					
NB R	94	1207 >	792	5.6	0.8	B	5.6
WB L	197	1453		2.9	0.5	A	1.8

Intersection Delay = 2.2 sec/veh

APPENDIX G

LOS WORKSHEETS FOR 2020 NO BUILD CONDITIONS ANALYSIS

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T1 US 23 Bus. NORTH
ANALYST..... AJN
TIME OF ANALYSIS..... 4:15 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	4
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.9
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	54 / 46
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	4	3	3.2	.85	.98	.89
B	5	3.4	3.9	.85	.98	.86
C	5	3.4	3.9	.85	.98	.86
D	5	2.9	3.3	.85	.98	.86
E	5	2.9	3.3	.92	.98	.86

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 276
ACTUAL FLOW RATE: 307

LOS	SERVICE FLOW RATE	V/C
A	62	.03
B	260	.13
C	561	.28
D	861	.43
E	1951	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T2 US 23 Bus. South
ANALYST..... AJN
TIME OF ANALYSIS..... 3:00 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 4
PERCENTAGE OF BUSES..... 0
PERCENTAGE OF RECREATIONAL VEHICLES..... 0
DESIGN SPEED (MPH)..... 50
PEAK HOUR FACTOR..... .86
DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 46 / 54
LANE WIDTH (FT)..... 11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)... 4
PERCENT NO PASSING ZONES..... 95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	4	3	3.2	.85	.98	.89
B	5	3.4	3.9	.85	.98	.86
C	5	3.4	3.9	.85	.98	.86
D	5	2.9	3.3	.85	.98	.86
E	5	2.9	3.3	.92	.98	.86

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 895
ACTUAL FLOW RATE: 1041

LOS	SERVICE FLOW RATE	V/C
A	62	.03
B	261	.13
C	563	.28
D	865	.43
E	1959	.9

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T3 VA 83 WISE/PICKENSON COUNTY LINE
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	4
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.93
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	62 / 38
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.98	.89
B	5	3.4	3.9	.85	.98	.86
C	5	3.4	3.9	.85	.98	.86
D	5	2.9	3.3	.85	.98	.86
E	5	2.9	3.3	.92	.98	.86

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 597
ACTUAL FLOW RATE: 642

LOS	SERVICE FLOW RATE	V/C
A	62	.03
B	261	.13
C	563	.28
D	865	.43
E	1959	.9

LOS FOR GIVEN CONDITIONS: D

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T4 VA 83/63 CLINCHCO
ANALYST..... AJN
TIME OF ANALYSIS..... 3:45 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	12
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.91
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	61 / 39
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.98	.74
B	5	3.4	3.9	.85	.98	.68
C	5	3.4	3.9	.85	.98	.68
D	5	2.9	3.3	.85	.98	.68
E	5	2.9	3.3	.92	.98	.68

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 368
ACTUAL FLOW RATE: 404

LOS	SERVICE FLOW RATE	V/C
A	51	.03
B	205	.13
C	441	.28
D	678	.43
E	1535	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T5 VA 83 @ PRATER
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	6
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.8
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	34 / 66
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	4	3	3.2	.85	.98	.85
B	5	3.4	3.9	.85	.98	.81
C	5	3.4	3.9	.85	.98	.81
D	5	2.9	3.3	.85	.98	.81
E	5	2.9	3.3	.92	.98	.81

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 315
ACTUAL FLOW RATE: 394

LOS	SERVICE FLOW RATE	V/C
A	59	.03
B	245	.13
C	527	.28
D	809	.43
E	1832	.9

LOS FOR GIVEN CONDITIONS: C

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T6 US 460/VA 83 between GRUNDY + VANSANT
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	8
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.89
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	52 / 48
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	4	3	3.2	.85	.98	.81
B	5	3.4	3.9	.85	.98	.76
C	5	3.4	3.9	.85	.98	.76
D	5	2.9	3.3	.85	.98	.76
E	5	2.9	3.3	.92	.98	.76

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 1449
ACTUAL FLOW RATE: 1628

LOS	SERVICE FLOW RATE	V/C
A	56	.03
B	230	.13
C	495	.28
D	760	.43
E	1721	.9

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T7 VA 53 West of Stacy
ANALYST..... AJN
TIME OF ANALYSIS..... 3:15 peak hour
DATE OF ANALYSIS..... 10-06-1997
OTHER INFORMATION.... No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	5
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.76
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	60 / 40
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f W	f d	f HV
A	4	3	3.2	.85	.98	.87
B	5	3.4	3.9	.85	.98	.83
C	5	3.4	3.9	.85	.98	.83
D	5	2.9	3.3	.85	.98	.83
E	5	2.9	3.3	.92	.98	.83

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 439
ACTUAL FLOW RATE: 578

LOS	SERVICE FLOW RATE	V/C
A	61	.03
B	253	.13
C	544	.28
D	836	.43
E	1893	.9

LOS FOR GIVEN CONDITIONS: D

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

File Name ..... T8.HC7 US 460 NEAR OAKWOOD
Facility Section..... T8 -- VA 460
From/To.....
Analyst..... AJN
Time of Analysis..... 4:15 pm peak hour
Date of Analysis..... 11/03/97
Other Information....

A. Geometrics and Traffic Input	Direction 1	Direction 2
Volume	585	503
Peak-Hour Factor or Peak 15 Minutes	0.93	0.88
Number of Lanes	2	2
Percentage of Trucks and Buses	4	4
Percentage of Recreational Vehicles	0	0
Ideal Free-Flow Speed (mph)	50.0	50.0
Type of Median	U	U
Lane Width (ft)	11.0	11.0
Distance from Roadway Edge (ft)	3.0	3.0
Access Points per Mile	20.0	20.0

B. Adjustment Factors

	Terrain Type	E T	E R	F HV	F M	F LW	F LC	F A
Dir 1	ROLLING	3.00		0.93	1.60	1.90	0.60	5.00
Dir 2		3.00		0.93	1.60	1.90	0.60	5.00

C. Level of Service Results	Direction 1	Direction 2
Service Flow Rate (Vp)	340	309
Free Flow Speed (mph)	40.8	40.8
Average Passenger Car Speed (mph)	40.8	40.8
Density (pcpmpl)	8.3	7.6
Level of Service (LOS)	A	A

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T-13
ANALYST..... AJN
TIME OF ANALYSIS..... 4:30 peak hour
DATE OF ANALYSIS..... 10-31-97
OTHER INFORMATION.... VA 83 ~~west~~ EAST of Grundy st - No-build Foreca

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	5
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.75
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	54 / 46
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E T	E B	E R	f w	f d	f HV
A	4	3	3.2	.85	.98	.87
B	5	3.4	3.9	.85	.98	.83
C	5	3.4	3.9	.85	.98	.83
D	5	2.9	3.3	.85	.98	.83
E	5	2.9	3.3	.92	.98	.83

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 1086
ACTUAL FLOW RATE: 1448

LOS	SERVICE FLOW RATE	V/C
A	61	.03
B	253	.13
C	544	.28
D	836	.43
E	1893	.9

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS
****

FACILITY LOCATION.... T-14
ANALYST..... AJN
TIME OF ANALYSIS..... 3:30 peak hour
DATE OF ANALYSIS..... 10-31-97
OTHER INFORMATION.... 460 west of Grundy - No-build Forecast

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS.....	5
PERCENTAGE OF BUSES.....	0
PERCENTAGE OF RECREATIONAL VEHICLES.....	0
DESIGN SPEED (MPH).....	50
PEAK HOUR FACTOR.....	.84
DIRECTIONAL DISTRIBUTION (UP/DOWN).....	52 / 48
LANE WIDTH (FT).....	11
USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)...	4
PERCENT NO PASSING ZONES.....	95

B) CORRECTION FACTORS

ROLLING TERRAIN

LOS	E_T	E_B	E_R	f_w	f_d	f_{HV}
A	4	3	3.2	.85	.98	.87
B	5	3.4	3.9	.85	.98	.83
C	5	3.4	3.9	.85	.98	.83
D	5	2.9	3.3	.85	.98	.83
E	5	2.9	3.3	.92	.98	.83

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME(vph): 986
ACTUAL FLOW RATE: 1174

LOS	SERVICE FLOW RATE	V/C
A	61	.03
B	253	.13
C	544	.28
D	836	.43
E	1893	.9

LOS FOR GIVEN CONDITIONS: E

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
LANE VOLUME WORKSHEET

File name: V1-1NOB.HC9 Date: 03-03-1998 Time Period: AM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

Peak hour factor: .95

Comment: No Build Forecast

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
LEFT TURN MOVEMENT				
1. LT volume	0	268	0	204
2. Opposing mainline volume	N/A	0	N/A	202
3. Number of exclusive LT lanes	0	1	0	1
Cross Product [2] * [1]	N/A	0	N/A	41208
Left Lane Configuration (E=Excl, S=Shrd):	E	E		E
Left Turn Treatment Type:	Perm	NOpp	Perm	Perm
4. LT adjustment factor	N/A	.85	N/A	1.0
5. LT lane vol	N/A	0	N/A	N/A
RIGHT TURN MOVEMENT				
Right Lane Configuration (E=Excl, S=Shrd)	S	E	E	S
6. RT volume	0	160	125	0
7. Exclusive lanes	N/A	1	1	N/A
8. RT adjustment factor	.85	.85	.85	.85
9. Exclusive RT lane volume	0	188	147	0
10. Shared lane vol	0	0	0	0
THROUGH MOVEMENT				
11. Thru volume	0	0	77	168
12. Parking adjustment factor	1	1	1	.8
13. No. of thru lanes including shared	0	0	1	1
14. Total approach volume	0	315	77	210
15. Prop. of left turns in lane group	N/A	N/A	N/A	0
16. Left turn equivalence				1.81
17. LT adj. factor:	N/A	N/A	N/A	N/A
18. Through lane volume	0	315	77	210
19. Critical lane volume	0	315	147	210

Left Turn Check (if [16] > 8)
20. Permitted left turn sneaker capacity: N/A
7200/Cmax

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
SIGNAL OPERATIONS WORKSHEET

File name: V1-1NOB.HC9 Date: 03-03-1998 Time Period: AM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Phase Plan Selection from Lane Volume Worksheet				
Critical through-RT vol: [19]	0	315	147	210
LT lane vol: [5]	N/A	0	N/A	N/A
Left turn protection: (P/U/N)	U	N	U	U
Dominant left turn: (Indicate by '*')	*			*

Selection Criteria based on the specified left turn protection

* Indicates the dominant left turn for each opposing pair

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	*P	P	*P	P
Plan 3b:	P	*P	P	*P
Plan 4:	N	N	N	N

Phase plan selected (1 to 4) 1 1

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

	Value	--- EAST-WEST ----			-- NORTH-SOUTH ---		
		Ph 1	Ph 2	Ph 3	Ph 1	Ph 2	Ph 3
Movement codes		WTL	WTL		NSG		
Critical phase vol [CV]		315	0	0	210	0	0
Critical sum [CS]	525						
CBD adjustment [CBD]	.9						
Reference sum [RS]	1462						
Lost time/phase [PL]		3	0	0	3	0	0
Lost time/cycle [TL]	6						
Cycle length [CYC]	60						
Green time		35.4	0	0	24.6	0	0
Critical v/c ratio [Xcm]	0.34						
Status	Under capacity.						

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
LANE VOLUME WORKSHEET

File name: V1-1NOB.HC9 Date: 03-03-1998 Time Period: AM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

Peak hour factor: .95

Comment: No Build Forecast

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
LEFT TURN MOVEMENT				
1. LT volume	0	268	0	204
2. Opposing mainline volume	N/A	0	N/A	202
3. Number of exclusive LT lanes	0	1	0	1
Cross Product [2] * [1]	N/A	0	N/A	41208
Left Lane Configuration (E=Excl, S=Shrd):	E	E		E
Left Turn Treatment Type:	Perm	NOpp	Perm	Perm
4. LT adjustment factor	N/A	.85	N/A	1.0
5. LT lane vol	N/A	0	N/A	N/A
RIGHT TURN MOVEMENT				
Right Lane Configuration (E=Excl, S=Shrd)	S	E	E	S
6. RT volume	0	160	125	0
7. Exclusive lanes	N/A	1	1	N/A
8. RT adjustment factor	.85	.85	.85	.85
9. Exclusive RT lane volume	0	188	147	0
10. Shared lane vol	0	0	0	0
THROUGH MOVEMENT				
11. Thru volume	0	0	77	168
12. Parking adjustment factor	1	1	1	.8
13. No. of thru lanes including shared	0	0	1	1
14. Total approach volume	0	315	77	210
15. Prop. of left turns in lane group	N/A	N/A	N/A	0
16. Left turn equivalence				1.81
17. LT adj. factor:	N/A	N/A	N/A	N/A
18. Through lane volume	0	315	77	210
19. Critical lane volume	0	315	147	210

Left Turn Check (if [16] > 8)

20. Permitted left turn sneaker capacity: N/A
7200/Cmax

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
SIGNAL OPERATIONS WORKSHEET

File name: V1-1NOB.HC9 Date: 03-03-1998 Time Period: AM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Phase Plan Selection from Lane Volume Worksheet				
Critical through-RT vol: [19]	0	315	147	210
LT lane vol: [5]	N/A	0	N/A	N/A
Left turn protection: (P/U/N)	U	N	U	U
Dominant left turn: (Indicate by '*')	*			*

Selection Criteria based on the specified left turn protection

* Indicates the dominant left turn for each opposing pair

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	*P	P	*P	P
Plan 3b:	P	*P	P	*P
Plan 4:	N	N	N	N

Phase plan selected (1 to 4) 1 1

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

	Value	--- EAST-WEST ---- Ph 1	Ph 2	Ph 3	-- NORTH-SOUTH --- Ph 1	Ph 2	Ph 3
Movement codes		WTL	WTL		NSG		
Critical phase vol [CV]		315	0	0	210	0	0
Critical sum [CS]	525						
CBD adjustment [CBD]	.9						
Reference sum [RS]	1462						
Lost time/phase [PL]		3	0	0	3	0	0
Lost time/cycle [TL]	6						
Cycle length [CYC]	60						
Green time		35.4	0	0	24.6	0	0
Critical v/c ratio [Xcm]	0.34						
Status	Under capacity.						

INTERSECTION DIAGRAM

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Intersection: VA 83 and Business US 23
Time period: AM peak

```
                                     Business US 23
                     ¤                     |              ¤
   Volumes           ¤                     |              ¤    ^ 160
   SB Total          ¤                     |              ¤    ââââââ
     372             ¤                     |              ¤
                     ¤                     |              ¤         0  WB Total
 °      °      °     ¤      1  1           |              ¤    <ááááá     428
 °      °      °     ¤                     |              ¤
 °      °      °     ¤      °  °           |              ¤       268
<ì      v      â>    ¤      °  °           |              ¤    Öááááá
 0     168    204    ¤      °  °           |              ¤    v
                     ¤      °  â>          |              ¤
ëëëëëëëëëëëëëëëëëëëëë¥      v              |              àëëëëëëëëëëëëëëëëëëëëëë
Legend                      [B] [B]
[X] = Level of Service
 ^
#áì = No. of Lanes                                        ^
 ^                                                        âáááá 1
Dáì = De facto Turn
                                                     [B]  Öáááá 1
                                                          v
--------------------              Intersection
                                      [B]
                                                      --------------------

                                                                VA 83

                                         [B] [B]
ëëëëëëëëëëëëëëëëëëëëë£                    ^           èëëëëëëëëëëëëëëëëëëëëë
                     ¤              |     °  Ö>      ¤
              0^     ¤              |     °  °       ¤     0     77     125
          ááááàì     ¤              |     °  °       ¤    <¢     ^      Ö>
                     ¤              |     °  °       ¤     °     °      °
EB Total       0     ¤              |                ¤     °     °      °
   0      áááá>      ¤              |     1  1       ¤     °     °      °
                     ¤              |                ¤
               0     ¤              |                ¤          202
          ááááá¢     ¤              |                ¤        NB Total
               v     ¤              |                ¤
                     ¤              |                ¤
```

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
LANE VOLUME WORKSHEET

File name: V1-2ANOB.HC9 Date: 03-03-1998 Time Period: PM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

Peak hour factor: .95

Comment: No Build Forecast

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
LEFT TURN MOVEMENT				
1. LT volume	0	203	0	180
2. Opposing mainline volume	N/A	0	N/A	578
3. Number of exclusive LT lanes	0	1	0	1
Cross Product [2] * [1]	N/A	0	N/A	104040
Left Lane Configuration (E=Excl, S=Shrd):	E	E		E
Left Turn Treatment Type:	Perm	NOpp	Perm	Perm
4. LT adjustment factor	N/A	.85	N/A	1.0
5. LT lane vol	N/A	0	N/A	N/A
RIGHT TURN MOVEMENT				
Right Lane Configuration (E=Excl, S=Shrd)	S	E	E	S
6. RT volume	0	150	345	0
7. Exclusive lanes	N/A	1	1	N/A
8. RT adjustment factor	.85	.85	.85	.85
9. Exclusive RT lane volume	0	176	406	0
10. Shared lane vol	0	0	0	0
THROUGH MOVEMENT				
11. Thru volume	0	0	233	226
12. Parking adjustment factor	1	1	1	.8
13. No. of thru lanes including shared	0	0	1	1
14. Total approach volume	0	239	233	282
15. Prop. of left turns in lane group	N/A	N/A	N/A	0
16. Left turn equivalence				7.66
17. LT adj. factor:	N/A	N/A	N/A	N/A
18. Through lane volume	0	239	233	282
19. Critical lane volume	0	239	406	282

Left Turn Check (if [16] > 8)

20. Permitted left turn sneaker capacity: 7200/Cmax N/A

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
SIGNAL OPERATIONS WORKSHEET

File name: V1-2ANOB.HC9 Date: 03-03-1998 Time Period: PM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Phase Plan Selection from Lane Volume Worksheet				
Critical through-RT vol: [19]	0	239	406	282
LT lane vol: [5]	N/A	0	N/A	N/A
Left turn protection: (P/U/N)	U	N	U	U
Dominant left turn: (Indicate by '*')	*			*

Selection Criteria based on the specified left turn protection

* Indicates the dominant left turn for each opposing pair

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	*P	P	*P	P
Plan 3b:	P	*P	P	*P
Plan 4:	N	N	N	N

Phase plan selected (1 to 4) 1 1

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

	Value	--- EAST-WEST ---- Ph 1	Ph 2	Ph 3	-- NORTH-SOUTH --- Ph 1	Ph 2	Ph 3
Movement codes		WTL	WTL		NSG		
Critical phase vol [CV]		239	0	0	406	0	0
Critical sum [CS]	645						
CBD adjustment [CBD]	.9						
Reference sum [RS]	1462						
Lost time/phase [PL]		3	0	0	3	0	0
Lost time/cycle [TL]	6						
Cycle length [CYC]	60						
Green time		23	0	0	37	0	0
Critical v/c ratio [Xcm]	0.42						
Status	Under capacity.						

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
LANE VOLUME WORKSHEET

File name: V1-2ANOB.HC9 Date: 03-03-1998 Time Period: PM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

Peak hour factor: .95

Comment: No Build Forecast

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
LEFT TURN MOVEMENT				
1. LT volume	0	203	0	180
2. Opposing mainline volume	N/A	0	N/A	578
3. Number of exclusive LT lanes	0	1	0	1
Cross Product [2] * [1]	N/A	0	N/A	104040
Left Lane Configuration (E=Excl, S=Shrd):	E	E		E
Left Turn Treatment Type:	Perm	NOpp	Perm	Perm
4. LT adjustment factor	N/A	.85	N/A	1.0
5. LT lane vol	N/A	0	N/A	N/A
RIGHT TURN MOVEMENT				
Right Lane Configuration (E=Excl, S=Shrd)	S	E	E	S
6. RT volume	0	150	345	0
7. Exclusive lanes	N/A	1	1	N/A
8. RT adjustment factor	.85	.85	.85	.85
9. Exclusive RT lane volume	0	176	406	0
10. Shared lane vol	0	0	0	0
THROUGH MOVEMENT				
11. Thru volume	0	0	233	226
12. Parking adjustment factor	1	1	1	.8
13. No. of thru lanes including shared	0	0	1	1
14. Total approach volume	0	239	233	282
15. Prop. of left turns in lane group	N/A	N/A	N/A	0
16. Left turn equivalence				7.66
17. LT adj. factor:	N/A	N/A	N/A	N/A
18. Through lane volume	0	239	233	282
19. Critical lane volume	0	239	406	282

Left Turn Check (if [16] > 8)

20. Permitted left turn sneaker capacity: N/A
7200/Cmax

HIGHWAY CAPACITY MANUAL SIGNALIZED INTERSECTION PLANNING METHOD
SIGNAL OPERATIONS WORKSHEET

File name: V1-2ANOB.HC9 Date: 03-03-1998 Time Period: PM peak

(E/W): VA 83 (N/S): Business US 23 Analyst : DES

	EAST BOUND	WEST BOUND	NORTH BOUND	SOUTH BOUND
Phase Plan Selection from Lane Volume Worksheet				
Critical through-RT vol: [19]	0	239	406	282
LT lane vol: [5]	N/A	0	N/A	N/A
Left turn protection: (P/U/N)	U	N	U	U
Dominant left turn: (Indicate by '*')	*			*

Selection Criteria based on the specified left turn protection

* Indicates the dominant left turn for each opposing pair

Plan 1:	U	U	U	U
Plan 2a:	U	P	U	P
Plan 2b:	P	U	P	U
Plan 3a:	*P	P	*P	P
Plan 3b:	P	*P	P	*P
Plan 4:	N	N	N	N

Phase plan selected (1 to 4) 1 1

Min. cycle (Cmin) 60 Max. cycle (Cmax) 120

Timing Plan

	Value	--- EAST-WEST ---- Ph 1	Ph 2	Ph 3	-- NORTH-SOUTH --- Ph 1	Ph 2	Ph 3
Movement codes		WTL	WTL		NSG		
Critical phase vol [CV]		239	0	0	406	0	0
Critical sum [CS]	645						
CBD adjustment [CBD]	.9						
Reference sum [RS]	1462						
Lost time/phase [PL]		3	0	0	3	0	0
Lost time/cycle [TL]	6						
Cycle length [CYC]	60						
Green time		23	0	0	37	0	0
Critical v/c ratio [Xcm]	0.42						
Status	Under capacity.						

INTERSECTION DIAGRAM

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=============================================================

     Intersection: VA 83 and Business US 23
      Time period: PM peak

                                   Business US 23
                            ¤               |           ¤
      Volumes               ¤               |           ¤     ^  150
      SB Total              ¤               |           ¤     ââââââ
        406                 ¤               |           ¤
                            ¤               |           ¤          0  WB Total
  °      °      °           ¤     1  1      |           ¤     <ááááá     353
  °      °      °           ¤               |           ¤
  °      °      °           ¤     °  °      |           ¤       203
 <ì      v      â>          ¤     °  °      |           ¤     Öááááá
  0     226    180          ¤     °  °      |           ¤     v
                            ¤     °  â>     |           ¤
ëëëëëëëëëëëëëëëëëëëëëë¥          v          |           àëëëëëëëëëëëëëëëëëëëëëë
Legend                           [B] [B]
[X] = Level of Service
  ^
#áì = No. of Lanes                                      ^
  ^                                                     âáááá 1
Dáì = De facto Turn
                                                   [B]  Öáááá 1
                                                        v
--------------------          Intersection
                                  [B]
                                                    --------------------



                                                                 VA 83


                                         [B] [B]
ëëëëëëëëëëëëëëëëëëëëëë£                   ^              èëëëëëëëëëëëëëëëëëëëëë
                        ¤            |    °  Ö>         ¤
              0^        ¤            |    °  °          ¤     0    233    345
           ááááàì       ¤            |    °  °          ¤    <¢     ^      Ö>
                        ¤            |    °  °          ¤     °     °      °
 EB Total      0        ¤            |                  ¤     °     °      °
     0     áááá>        ¤            |    1  1          ¤     °     °      °
                        ¤            |                  ¤
               0        ¤            |                  ¤        578
           ááááá¢       ¤            |                  ¤      NB Total
               v        ¤            |                  ¤
                        ¤            |                  ¤
```

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 72 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....8:00 - 9:00 am No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	1	1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		180	41	67	212		49		113			
PHF		.95	.95	.95	.95		.95		.95			
Grade		4			-4			0				
MC's (%)				0			0					
SU/RV's (%)				0			0					
CV's (%)				5			5					
PCE's				0.82			1.05		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	189	
Potential Capacity: (pcph)	1111	
Movement Capacity: (pcph)	1111	
Prob. of Queue-Free State:	0.88	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	232	
Potential Capacity: (pcph)	1329	
Movement Capacity: (pcph)	1329	
Prob. of Queue-Free State:	0.96	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	482	
Potential Capacity: (pcph)	557	
Major LT, Minor TH Impedance Factor:	0.96	
Adjusted Impedance Factor:	0.96	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	533	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	55	533 >					
			841	5.5	1.0	B	5.5
NB R	131	1111 >					
WB L	58	1329		2.8	0.0	A	0.7

Intersection Delay = 1.6 sec/veh

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 72 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....3:00 - 4:00 pm No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	1	1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		292	58	132	283		67		152			
PHF		.95	.95	.95	.95		.95		.95			
Grade		4			-4			0				
MC's (%)				0			0					
SU/RV's (%)				0			0					
CV's (%)				5			5					
PCE's				0.82			1.05		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	307	
Potential Capacity: (pcph)	968	
Movement Capacity: (pcph)	968	
Prob. of Queue-Free State:	0.82	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	368	
Potential Capacity: (pcph)	1145	
Movement Capacity: (pcph)	1145	
Prob. of Queue-Free State:	0.90	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	744	
Potential Capacity: (pcph)	393	
Major LT, Minor TH Impedance Factor:	0.90	
Adjusted Impedance Factor:	0.90	
Capacity Adjustment Factor due to Impeding Movements	0.90	
Movement Capacity: (pcph)	354	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	75	354 >	638	9.3	2.2	B	9.3
NB R	176	968 >					
SB L	114	1145		3.5	0.3	A	1.1

Intersection Delay = 2.5 sec/veh

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-2NOB.HC9
Area Type: Other 10-2-97 7:45 hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Left	64	0.95	67	L	67	1	1.000	1.000	67	1.00	0.00
Thru	445	0.95	468	TR	484	1	1.000	1.000	484	0.00	0.03
Right	15	0.95	16								
WB											
Left	13	0.95	14	L	14	1	1.000	1.000	14	1.00	0.00
Thru	493	0.95	519	TR	619	1	1.000	1.000	619	0.00	0.16
Right	95	0.95	100								
NB											
Left	1	0.95	1								
Thru	1	0.95	1	LTR	10	1	1.000	1.000	10	0.10	0.80
Right	8	0.95	8								
SB											
Left	91	0.95	96	L	96	1	1.000	1.000	96	1.00	0.00
Thru	6	0.95	6	TR	77	1	1.000	1.000	77	0.00	0.92
Right	67	0.95	71								

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.11	196
TR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1801
WB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.16	288
TR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.98	1.00	1766
NB											
LTR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.79	0.98	1405
SB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.92	1664
TR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.86	1.00	1559

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-2NOB.HC9
Area Type: Other 10-2-97 7:45 hr
Comment: No Build Forecast

Supplemental Permitted LT Worksheet

APPROACH	EB
Cycle Length, C	60
Actual Green Time for Lane Group, G	35
Effective Green Time for Lane Group, g	37
Opposing Effective Green Time, go	37
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	67
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	1.12
Adjusted Opposing Flow Rate, Vo	619
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	10.32
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.38
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	9.06
gu=g-gq (or g-gf)	27.94
fs=(875-0.625Vo)/1000	0.49
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	8.20
fmin	0.11
fm,(min=fmin;max=1.00)	0.11
flt=[fm+0.91(N-1)]/N	0.11

APPROACH	WB
Cycle Length, C	60
Actual Green Time for Lane Group, G	35
Effective Green Time for Lane Group, g	37
Opposing Effective Green Time, go	37
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	14
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	0.23
Adjusted Opposing Flow Rate, Vo	484
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	8.07
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.38
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	5.46
gu=g-gq (or g-gf)	31.54
fs=(875-0.625Vo)/1000	0.57
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	5.36
fmin	0.11
fm,(min=fmin;max=1.00)	0.16
flt=[fm+0.91(N-1)]/N	0.16

APPROACH	SB
Cycle Length, C	60
Actual Green Time for Lane Group, G	10
Effective Green Time for Lane Group, g	12

Opposing Effective Green Time, go	17
Number of Lanes in Lane Group, N	1
Proportion of Left Turns in Lane Group, Plt	1.00
Proportion of Left Turns in Opposing Flow, Plto	0.10
Adjusted Left-Turn Flow Rate, Vlt	96
Left Turns per Cycle: LTC=Vlt*C/3600	1.60
Adjusted Opposing Flow Rate, Vo	10
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	0.17
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.72
gq=4.943volc^0.762*qro^1.061-tl	0.00
gu=g-gq (or g-gf)	12.00
n=(gq-gf)/2	0.00
Ptho=1-Plto	0.90
El2	0.00
El1	1.09
fmin=2(1+Pl)/g	0.33
flt=[fm+0.91(N-1)]/N	0.92

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-2NOB.HC9
Area Type: Other 10-2-97 7:45 hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
L	67	196	0.342	0.617	121	0.554
TR	484	1801	0.269	0.617	1111	0.436
WB						
L	14	288	0.049	0.617	178	0.079
TR	619	1766	0.351	0.617	1089	0.568 *
NB						
LTR	10	1405	0.007	0.283	398	0.025 *
SB						
L	96	1664	0.058	0.200	333	0.288
TR	77	1559	0.049	0.200	312	0.247

Sum (v/s) critical = 0.358
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.397

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
L	0.554	0.617	5.1	1.000	121	16	4.0	9.1	B	5.3	B
TR	0.436	0.617	4.6	1.000	1111	16	0.2	4.8	A		
WB											
L	0.079	0.617	3.5	1.000	178	16	0.0	3.5	A	5.6	B
TR	0.568	0.617	5.2	1.000	1089	16	0.5	5.7	B		
NB											
LTR	0.025	0.283	11.8	1.000	398	16	0.0	11.8	B	11.8	B
SB											
L	0.288	0.200	15.5	1.000	333	16	0.1	15.6	C	15.5	C
TR	0.247	0.200	15.4	1.000	312	16	0.1	15.4	C		

Intersection Delay = 6.8 sec/veh Intersection LOS = B

HCS: Signalized Intersection Version 2.4d 03-02-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-1NOB.HC9
Area Type: Other 10-2-97 5:00 hr
Comment: No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<		> 1	<	1	1	<
Volumes	73	611	13	19	540	69	15	2	8	78	1	61
PHF or PK15	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Lane W (ft)	12.0	12.0		12.0	12.0			12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
Parking	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Arr Type	3	3		3	3			3		3	3	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left	*	*	
Thru	*				Thru	*	*	
Right	*				Right	*	*	
Peds					Peds			
WB Left	*				SB Left		*	
Thru	*				Thru		*	
Right	*				Right		*	
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	35.0P				Green	5.0P	10.0P	
Yellow/AR	5.0				Yellow/AR	0.0	5.0	

Cycle Length: 60 secs Phase combination order: #1 #5 #6

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-1NOB.HC9
Area Type: Other 10-2-97 5:00 hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Left	73	0.95	77	L	77	1	1.000	1.000	77	1.00	0.00
Thru	611	0.95	643	TR	657	1	1.000	1.000	657	0.00	0.02
Right	13	0.95	14								
WB											
Left	19	0.95	20	L	20	1	1.000	1.000	20	1.00	0.00
Thru	540	0.95	568	TR	641	1	1.000	1.000	641	0.00	0.11
Right	69	0.95	73								
NB											
Left	15	0.95	16								
Thru	2	0.95	2	LTR	26	1	1.000	1.000	26	0.62	0.31
Right	8	0.95	8								
SB											
Left	78	0.95	82	L	82	1	1.000	1.000	82	1.00	0.00
Thru	1	0.95	1	TR	65	1	1.000	1.000	65	0.00	0.98
Right	61	0.95	64								

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f P	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.11	196
TR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1804
WB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.11	196
TR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.98	1.00	1779
NB											
LTR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.86	0.89	1385
SB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.87	1577
TR	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1542

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-1NOB.HC9
Area Type: Other 10-2-97 5:00 hr
Comment: No Build Forecast

Supplemental Permitted LT Worksheet

APPROACH	EB
Cycle Length, C	60
Actual Green Time for Lane Group, G	35
Effective Green Time for Lane Group, g	37
Opposing Effective Green Time, go	37
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	77
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	1.28
Adjusted Opposing Flow Rate, Vo	641
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	10.68
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.38
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	9.72
gu=g-gq (or g-gf)	27.28
fs=(875-0.625Vo)/1000	0.47
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	8.20
fmin	0.11
fm,(min=fmin;max=1.00)	0.11
flt=[fm+0.91(N-1)]/N	0.11

APPROACH	WB
Cycle Length, C	60
Actual Green Time for Lane Group, G	35
Effective Green Time for Lane Group, g	37
Opposing Effective Green Time, go	37
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	20
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	0.33
Adjusted Opposing Flow Rate, Vo	657
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	10.95
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.38
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	10.22
gu=g-gq (or g-gf)	26.78
fs=(875-0.625Vo)/1000	0.46
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	8.20
fmin	0.11
fm,(min=fmin;max=1.00)	0.11
flt=[fm+0.91(N-1)]/N	0.11

APPROACH	SB
Cycle Length, C	60
Actual Green Time for Lane Group, G	10
Effective Green Time for Lane Group, g	12

Opposing Effective Green Time, go	17
Number of Lanes in Lane Group, N	1
Proportion of Left Turns in Lane Group, Plt	1.00
Proportion of Left Turns in Opposing Flow, Plto	0.62
Adjusted Left-Turn Flow Rate, Vlt	82
Left Turns per Cycle: LTC=Vlt*C/3600	1.37
Adjusted Opposing Flow Rate, Vo	26
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	0.43
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.72
gq=4.943volc^0.762*qro^1.061-tl	0.00
gu=g-gq (or g-gf)	12.00
n=(gq-gf)/2	0.00
Ptho=1-Plto	0.38
El2	0.00
El1	1.15
fmin=2(1+Pl)/g	0.33
flt=[fm+0.91(N-1)]/N	0.87

HCS: Signalized Intersection Version 2.4d 03-02-1998 4

Streets: (E-W) 83 (N-S) 631
Analyst: DES File Name: V2-1NOB.HC9
Area Type: Other 10-2-97 5:00 hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
L	77	196	0.393	0.617	121	0.637 *
TR	657	1804	0.364	0.617	1112	0.591
WB						
L	20	196	0.102	0.617	121	0.165
TR	641	1779	0.360	0.617	1097	0.584
NB						
LTR	26	1385	0.019	0.283	392	0.066 *
SB						
L	82	1577	0.052	0.200	315	0.260
TR	65	1542	0.042	0.200	308	0.211

Sum (v/s) critical = 0.412
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.457

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
L	0.637	0.617	5.5	1.000	121	16	7.2	12.7	B	6.6	B
TR	0.591	0.617	5.3	1.000	1112	16	0.6	5.9	B		
WB											
L	0.165	0.617	3.7	1.000	121	16	0.1	3.8	A	5.8	B
TR	0.584	0.617	5.2	1.000	1097	16	0.6	5.8	B		
NB											
LTR	0.066	0.283	11.9	1.000	392	16	0.0	11.9	B	11.9	B
SB											
L	0.260	0.200	15.4	1.000	315	16	0.1	15.5	C	15.4	C
TR	0.211	0.200	15.2	1.000	308	16	0.1	15.3	C		

Intersection Delay = 7.2 sec/veh Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 03-02-1998

BMI

Streets: (E-W) 83 (N-S) 631

Analyst: DES File Name: V2-1NOB.HC9

Area Type: Other 10-2-97 5:00 hr

Comment: No Build Forecast

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<		> 1	<	1	1	<
Volumes	73	611	13	19	540	69	15	2	8	78	1	61
Lane W (ft)	12.0	12.0		12.0	12.0			12.0		12.0	12.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left	*	*		
Thru	*				Thru	*	*		
Right	*				Right	*	*		
Peds					Peds				
WB Left	*				SB Left		*		
Thru	*				Thru		*		
Right	*				Right		*		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	35.0P				Green	5.0P	10.0P		
Yellow/AR	5.0				Yellow/AR	0.0	5.0		

Cycle Length: 60 secs Phase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	121	196	0.637	0.617	12.7	B	6.6	B
	TR	1112	1804	0.591	0.617	5.9	B		
WB	L	121	196	0.165	0.617	3.8	A	5.8	B
	TR	1097	1779	0.584	0.617	5.8	B		
NB	LTR	392	1385	0.066	0.283	11.9	B	11.9	B
SB	L	315	1577	0.260	0.200	15.5	C	15.4	C
	TR	308	1542	0.211	0.200	15.3	C		

Intersection Delay = 7.2 sec/veh Intersection LOS = B

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.457

HCS: Signalized Intersection Version 2.4d 03-03-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-2NOB.HC9
Area Type: Other 10-1-97 9:45 - 10:45 AM
Comment: No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1		1				1	1			1	1
Volumes	297		232				321	102			70	285
PHF or PK15	0.95		0.95				0.95	0.95			0.95	0.95
Lane W (ft)	12.0		12.0				12.0	12.0			12.0	12.0
Grade		0						0			0	
% Heavy Veh	5		2				2	2			2	5
Parking	(Y/N) N						(Y/N) Y		50	(Y/N) N		
Bus Stops			0						0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N						(Y/N) N			(Y/N) N		
Arr Type	3		3				3	3			3	3
RTOR Vols			60						0		100	
Lost Time	3.00		3.00				3.00	3.00			3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru								
Right	*							
Peds								
WB Left								
Thru								
Right								
Peds								
NB Right								
SB Right								
Green	20.0P							
Yellow/AR	5.0							

	5	6
NB Left		*
Thru		*
Right		
Peds		
SB Left		
Thru	*	*
Right	*	*
Peds		
EB Right		
WB Right		
Green	6.0P	22.0P
Yellow/AR	5.0	5.0

Cycle Length: 63 secs Phase combination order: #1 #5 #6

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-2NOB.HC9
Area Type: Other 10-1-97 9:45 hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Left	297	0.95	313	L	313	1	1.000	1.000	313	1.00	0.00
Right	232	0.95	181	R	181	1	1.000	1.000	181	0.00	1.00
NB											
Left	321	0.95	338	L	338	1	1.000	1.000	338	1.00	0.00
Thru	102	0.95	107	T	107	1	1.000	1.000	107	0.00	0.00
SB											
Thru	70	0.95	74	T	74	1	1.000	1.000	74	0.00	0.00
Right	285	0.95	195	R	195	1	1.000	1.000	195	0.00	1.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1719
R	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	0.85	1.00	1583
NB											
L	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.75	1403
T	1900	1	1.00	0.98	1.00	0.65	1.00	1.00	1.00	1.00	1211
SB											
T	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1863
R	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1538

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-2NOB.HC9
Area Type: Other 10-1-97 9:45 hr
Comment: No Build Forecast

Supplemental Permitted LT Worksheet

APPROACH	NB
Cycle Length, C	63
Actual Green Time for Lane Group, G	22
Effective Green Time for Lane Group, g	24
Opposing Effective Green Time, go	35
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	338
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	5.91
Adjusted Opposing Flow Rate, Vo	74
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	1.29
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.44
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	0.00
gu=g-gq (or g-gf)	24.00
fs=(875-0.625Vo)/1000	0.83
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	1.33
fmin	0.17
fm,(min=fmin;max=1.00)	0.75
flt=[fm+0.91(N-1)]/N	0.75

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-2NOB.HC9
Area Type: Other 10-1-97 9:45 hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
L	313	1719	0.182	0.349	600	0.521 *
R	181	1583	0.114	0.349	553	0.327
WB						
NB						
L	338	1403	0.241	0.381	534	0.632
T	107	1211	0.088	0.381	461	0.232
SB						
T	74	1863	0.040	0.556	1035	0.071
R	195	1538	0.127	0.556	854	0.228 *

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.309
Critical v/c(x) = 0.341

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
L	0.521	0.349	12.4	1.000	600	16	0.7	13.1	B	12.5	B
R	0.327	0.349	11.4	1.000	553	16	0.1	11.6	B		
WB											
NB											
L	0.632	0.381	12.1	1.000	534	16	1.7	13.8	B	12.9	B
T	0.232	0.381	10.1	1.000	461	16	0.0	10.1	B		
SB											
T	0.071	0.556	4.9	1.000	1035	16	0.0	4.9	A	5.3	B
R	0.228	0.556	5.4	1.000	854	16	0.0	5.4	B		

Intersection Delay = 11.1 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

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=================================================================

     Intersection: 83 and 607/83
      Time period: 9:45 hr

                                    607/83
                     ¤                |                 ¤
      Volumes        ¤                |                 ¤     ^    0
      SB Total       ¤                |                 ¤     ââââââ
        355          ¤                |                 ¤
                     ¤                |                 ¤          0  WB Total
   °     °     °     ¤    1  1        |                 ¤     <âââââ       0
   °     °     °     ¤                |                 ¤
   °     °     °     ¤    °  °        |                 ¤          0
  <ì     v     â>    ¤    °  °        |                 ¤     Öââââââ
  285    70    0     ¤    °  °        |                 ¤     v
                     ¤   <ì  °        |                 ¤
ëëëëëëëëëëëëëëëëëëëëëë¥      v        |                 àëëëëëëëëëëëëëëëëëëëëëë
Legend                  [B] [A]
[X] = Level of Service
  ^
#âì = No. of Lanes
  ^
Dâì = De facto Turn


--------------------          Intersection
                                  [B]
                                                  --------------------
               ^
         1 ââââì     [B]

         1 ââââ¢     [B]
               v
                                                               83

                                  [B] [B]
ëëëëëëëëëëëëëëëëëëëëëë£                ^
                     ¤          |  <¢  °     èëëëëëëëëëëëëëëëëëëëëëë
           297^      ¤          |   °  °     ¤
          ââââââì    ¤          |   °  °     ¤   321    102     0
                     ¤          |   °  °     ¤   <¢      ^      Ö>
EB Total     0       ¤          |            ¤    °      °      °
  529     âââââ>     ¤          |            ¤    °      °      °
                     ¤          |   1  1     ¤    °      °      °
           232       ¤          |            ¤
          âââââ¢      ¤          |            ¤       423
              v      ¤          |            ¤     NB Total
                     ¤          |            ¤
                     ¤          |            ¤
```

HCS: Signalized Intersection Version 2.4d 03-03-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-1NOB.HC9
Area Type: Other 10-1-97 4:30 - 5:30 PM
Comment: No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1		1				1	1			1	1
Volumes	407		321				344	108			137	311
PHF or PK15	0.95		0.95				0.95	0.95			0.95	0.95
Lane W (ft)	12.0		12.0				12.0	12.0			12.0	12.0
Grade		0						0			0	
% Heavy Veh	5		2				2	2			2	5
Parking	(Y/N) N						(Y/N) Y		50	(Y/N) N		
Bus Stops			0						0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N) N						(Y/N) N			(Y/N) N		
Arr Type	3		3				3	3			3	3
RTOR Vols			100						0			100
Lost Time	3.00		3.00				3.00	3.00			3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru								
Right	*							
Peds								
WB Left								
Thru								
Right								
Peds								
NB Right								
SB Right								
Green	26.0P							
Yellow/AR	5.0							

	5	6	7	8
NB Left		*		
Thru		*		
Right				
Peds				
SB Left				
Thru	*	*		
Right	*	*		
Peds				
EB Right				
WB Right				
Green	4.0P	20.0P		
Yellow/AR	0.0	5.0		

Cycle Length: 60 secs Phase combination order: #1 #5 #6

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-1NOB.HC9
Area Type: Other 10-1-97 4:30 hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Left	407	0.95	428	L	428	1	1.000	1.000	428	1.00	0.00
Right	321	0.95	233	R	233	1	1.000	1.000	233	0.00	1.00
NB											
Left	344	0.95	362	L	362	1	1.000	1.000	362	1.00	0.00
Thru	108	0.95	114	T	114	1	1.000	1.000	114	0.00	0.00
SB											
Thru	137	0.95	144	T	144	1	1.000	1.000	144	0.00	0.00
Right	311	0.95	222	R	222	1	1.000	1.000	222	0.00	1.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1719
R	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	0.85	1.00	1583
NB											
L	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.63	1172
T	1900	1	1.00	0.98	1.00	0.65	1.00	1.00	1.00	1.00	1211
SB											
T	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1863
R	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1538

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-1NOB.HC9
Area Type: Other 10-1-97 4:30 hr
Comment: No Build Forecast

Supplemental Permitted LT Worksheet

APPROACH	NB
Cycle Length, C	60
Actual Green Time for Lane Group, G	20
Effective Green Time for Lane Group, g	22
Opposing Effective Green Time, go	26
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	362
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	6.03
Adjusted Opposing Flow Rate, Vo	144
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	2.40
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.57
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	0.00
gu=g-gq (or g-gf)	22.00
fs=(875-0.625Vo)/1000	0.79
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	1.59
fmin	0.18
fm,(min=fmin;max=1.00)	0.63
flt=[fm+0.91(N-1)]/N	0.63

Streets: (E-W) 83 (N-S) 607/83
Analyst: DES File Name: M2-1NOB.HC9
Area Type: Other 10-1-97 4:30 hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
L	428	1719	0.249	0.467	802	0.534 *
R	233	1583	0.147	0.467	739	0.315
WB						
NB						
L	362	1172	0.309	0.367	430	0.842
T	114	1211	0.094	0.367	444	0.257
SB						
T	144	1863	0.077	0.433	807	0.178
R	222	1538	0.144	0.433	666	0.333 *

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.393
Critical v/c(x) = 0.437

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
L	0.534	0.467	8.6	1.000	802	16	0.6	9.2	B	8.7	B
R	0.315	0.467	7.6	1.000	739	16	0.1	7.7	B		
WB											
NB											
L	0.842	0.367	13.2	1.000	430	16	9.8	23.0	C	19.9	C
T	0.257	0.367	10.1	1.000	444	16	0.1	10.2	B		
SB											
T	0.178	0.433	7.9	1.000	807	16	0.0	7.9	B	8.4	B
R	0.333	0.433	8.6	1.000	666	16	0.1	8.7	B		

Intersection Delay = 12.2 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

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INTERSECTION DIAGRAM
===================================================================

    Intersection: 83 and 607/83
     Time period: 4:30 hr

                                          607/83
                         ¤                  |               ¤
      Volumes            ¤                  |               ¤     ^    0
      SB Total           ¤                  |               ¤     ââââââ
        448              ¤                  |               ¤
                         ¤                  |               ¤          0  WB Total
   °      °      °       ¤    1   1         |               ¤     <ááááá       0
   °      °      °       ¤                  |               ¤
   °      °      °       ¤    °   °         |               ¤
  <ì      v      â>      ¤    °   °         |               ¤          0
  311    137     0       ¤    °   °         |               ¤     Öááááá
                         ¤   <ì   °         |               ¤     v
ëëëëëëëëëëëëëëëëëëëëëëë¥          v         |               ¤
Legend                        [B] [B]                      àëëëëëëëëëëëëëëëëëëëëëë
[X] = Level of Service
  ^
#áì = No. of Lanes
  ^
Dáì = De facto Turn


--------------------              Intersection
                                      [B]
                                                       --------------------
                      ^
               1 ááááì    [B]

               1 áááá¢    [B]
                      v
                                                                  83


                                       [C] [B]
ëëëëëëëëëëëëëëëëëëëëëë£                      ^
                      ¤                                 èëëëëëëëëëëëëëëëëëëëëëë
            407^      ¤            |     <¢   °         ¤
           ááááàì     ¤            |      °   °         ¤   344    108     0
                      ¤            |      °   °         ¤   <¢      ^      Ö>
EB Total      0       ¤            |      °   °         ¤    °      °      °
  728      áááá>      ¤            |                    ¤    °      °      °
                      ¤            |      1   1         ¤    °      °      °
            321       ¤            |                    ¤
           áááá¢      ¤            |                    ¤        452
              v       ¤            |                    ¤      NB Total
                      ¤            |                    ¤
                                   |                    ¤
```

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 63 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....7:45 - 8:45 am No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		77	76	51	136		105		53			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				12			23		23			
PCE's				1.12			1.23		1.23			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	121	
Potential Capacity: (pcph)	1202	
Movement Capacity: (pcph)	1202	
Prob. of Queue-Free State:	0.94	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	161	
Potential Capacity: (pcph)	1437	
Movement Capacity: (pcph)	1437	
Prob. of Queue-Free State:	0.96	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.95	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	318	
Potential Capacity: (pcph)	693	
Major LT, Minor TH Impedance Factor:	0.95	
Adjusted Impedance Factor:	0.95	
Capacity Adjustment Factor due to Impeding Movements	0.95	
Movement Capacity: (pcph)	661	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	137	661 >					
			778	6.3	1.2	B	6.3
NB R	69	1202 >					
WB L	60	1437		2.6	0.0	A	0.7

Intersection Delay = 2.3 sec/veh

BMI
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Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 63 (E-W) 83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....2:45 - 3:45 pm No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		93	85	53	171		75		67			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				12			23		23			
PCE's				1.12			1.23		1.23			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	142	
Potential Capacity: (pcph)	1173	
Movement Capacity: (pcph)	1173	
Prob. of Queue-Free State:	0.93	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	187	
Potential Capacity: (pcph)	1396	
Movement Capacity: (pcph)	1396	
Prob. of Queue-Free State:	0.95	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.95	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	378	
Potential Capacity: (pcph)	640	
Major LT, Minor TH Impedance Factor:	0.95	
Adjusted Impedance Factor:	0.95	
Capacity Adjustment Factor due to Impeding Movements	0.95	
Movement Capacity: (pcph)	608	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	97	608 >					
			787	6.0	1.0	B	6.0
NB R	87	1173 >					
WB L	63	1396		2.7	0.0	A	0.6

Intersection Delay = 1.8 sec/veh

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....8:00 - 9:00 am No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		107	88	59	107		84		39			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	160	
Potential Capacity: (pcph)	1149	
Movement Capacity: (pcph)	1149	
Prob. of Queue-Free State:	0.96	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	206	
Potential Capacity: (pcph)	1367	
Movement Capacity: (pcph)	1367	
Prob. of Queue-Free State:	0.95	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.95	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	334	
Potential Capacity: (pcph)	678	
Major LT, Minor TH Impedance Factor:	0.95	
Adjusted Impedance Factor:	0.95	
Capacity Adjustment Factor due to Impeding Movements	0.95	
Movement Capacity: (pcph)	643	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	92	643 >					
NB R	43	1149 >	748	5.9	0.7	B	5.9
WB L	65	1367		2.8	0.0	A	1.0

Intersection Delay = 1.8 sec/veh

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Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....3:30 - 4:30 pm No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		152	134	50	134		105		79			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	230	
Potential Capacity: (pcph)	1059	
Movement Capacity: (pcph)	1059	
Prob. of Queue-Free State:	0.92	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	301	
Potential Capacity: (pcph)	1232	
Movement Capacity: (pcph)	1232	
Prob. of Queue-Free State:	0.95	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.95	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	424	
Potential Capacity: (pcph)	602	
Major LT, Minor TH Impedance Factor:	0.95	
Adjusted Impedance Factor:	0.95	
Capacity Adjustment Factor due to Impeding Movements	0.95	
Movement Capacity: (pcph)	572	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	117	572 >					
NB R	87	1059 >	712	7.1	1.4	B	7.1
WB L	56	1232		3.1	0.0	A	0.8

Intersection Delay = 2.2 sec/veh

BMI
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Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 80/83 (E-W) 80/83/63
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....10:15 - 11:15 am No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		125	63	98	115		96		116			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				4			8		8			
PCE's				1.04			1.08		1.08			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	165	
Potential Capacity: (pcph)	1142	
Movement Capacity: (pcph)	1142	
Prob. of Queue-Free State:	0.88	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	198	
Potential Capacity: (pcph)	1380	
Movement Capacity: (pcph)	1380	
Prob. of Queue-Free State:	0.92	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.92	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	389	
Potential Capacity: (pcph)	630	
Major LT, Minor TH Impedance Factor:	0.92	
Adjusted Impedance Factor:	0.92	
Capacity Adjustment Factor due to Impeding Movements	0.92	
Movement Capacity: (pcph)	577	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	109	577 >					
NB R	132	1142 >	791	6.5	1.5	B	6.5
WB L	107	1380		2.8	0.2	A	1.3

Intersection Delay = 2.7 sec/veh

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 80/83 (E-W) 80/83/63
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....2:15 - 3:15 pm No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		125	108	152	148		84		176			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				4			8		8			
PCE's				1.04			1.08		1.08			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	189	
Potential Capacity: (pcph)	1111	
Movement Capacity: (pcph)	1111	
Prob. of Queue-Free State:	0.82	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	246	
Potential Capacity: (pcph)	1309	
Movement Capacity: (pcph)	1309	
Prob. of Queue-Free State:	0.87	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.86	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	505	
Potential Capacity: (pcph)	540	
Major LT, Minor TH Impedance Factor:	0.86	
Adjusted Impedance Factor:	0.86	
Capacity Adjustment Factor due to Impeding Movements	0.86	
Movement Capacity: (pcph)	465	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	95	465 >					
NB R	200	1111 >	768	7.6	2.0	B	7.6
WB L	166	1309		3.1	0.4	A	1.6

Intersection Delay = 3.1 sec/veh

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....10:00 -11:00 am No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		46	90	8	61		80		6			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	96	
Potential Capacity: (pcph)	1238	
Movement Capacity: (pcph)	1238	
Prob. of Queue-Free State:	1.00	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	143	
Potential Capacity: (pcph)	1465	
Movement Capacity: (pcph)	1465	
Prob. of Queue-Free State:	0.99	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.99	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	168	
Potential Capacity: (pcph)	846	
Major LT, Minor TH Impedance Factor:	0.99	
Adjusted Impedance Factor:	0.99	
Capacity Adjustment Factor due to Impeding Movements	0.99	
Movement Capacity: (pcph)	841	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	88	841 >					
			859	4.7	0.3	A	4.7
NB R	6	1238 >					
WB L	8	1465		2.5	0.0	A	0.3

Intersection Delay = 1.5 sec/veh

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 83 (E-W) 80/83
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....3:30 hour No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes		80	90	25	129		99		8			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0				
MC's (%)				0			0		0			
SU/RV's (%)				0			0		0			
CV's (%)				5			5		5			
PCE's				1.05			1.05		1.05			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	132	
Potential Capacity: (pcph)	1187	
Movement Capacity: (pcph)	1187	
Prob. of Queue-Free State:	0.99	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	179	
Potential Capacity: (pcph)	1409	
Movement Capacity: (pcph)	1409	
Prob. of Queue-Free State:	0.98	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.98	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	294	
Potential Capacity: (pcph)	715	
Major LT, Minor TH Impedance Factor:	0.98	
Adjusted Impedance Factor:	0.98	
Capacity Adjustment Factor due to Impeding Movements	0.98	
Movement Capacity: (pcph)	700	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	109	700 >					
			720	6.0	0.6	B	6.0
NB R	8	1187 >					
WB L	27	1409		2.6	0.0	A	0.4

Intersection Delay = 1.6 sec/veh

HCS: Signalized Intersection Version 2.4d 05-04-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-1NOB.HC9
Area Type: Other 10-1-97 11:15am
Comment: No Build Forecast AM peak hour

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1		1		1			
Volumes		372	299	196	410		187		177			
PHF or PK15		0.95	0.95	0.95	0.95		0.95		0.95			
Lane W (ft)		12.0	12.0	12.0	12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		5	5	10	10		8		8			
Parking	(Y/N) N			(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					
Arr Type		3	3	3	3		3		3			
RTOR Vols			20			0			15			
Lost Time		3.00	3.00	3.00	3.00		3.00		3.00			

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	46.0P							
Yellow/AR	5.0							

	5
NB Left	*
Thru	
Right	*
Peds	
SB Left	
Thru	
Right	
Peds	
EB Right	
WB Right	
Green	14.0P
Yellow/AR	5.0

Cycle Length: 70 secs Phase combination order: #1 #5

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-1NOB.HC9
Area Type: Other 10-1-97 11:15am
Comment: No Build Forecast AM peak hour

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Thru	372	0.95	392	T	392	1	1.000	1.000	392	0.00	0.00
Right	299	0.95	294	R	294	1	1.000	1.000	294	0.00	1.00
WB											
Left	196	0.95	206	L	206	1	1.000	1.000	206	1.00	0.00
Thru	410	0.95	432	T	432	1	1.000	1.000	432	0.00	0.00
NB											
Left	187	0.95	197	L	197	1	1.000	1.000	197	1.00	0.00
Right	177	0.95	170	R	170	1	1.000	1.000	170	0.00	1.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
T	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1810
R	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1538
WB											
L	1900	1	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.36	630
T	1900	1	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1727
NB											
L	1900	1	1.00	0.93	1.00	1.00	1.00	1.00	1.00	0.95	1671
R	1900	1	1.00	0.93	1.00	1.00	1.00	1.00	0.85	1.00	1495

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-1NOB.HC9
Area Type: Other 10-1-97 11:15am
Comment: No Build Forecast AM peak hour

Supplemental Permitted LT Worksheet

APPROACH	WB
Cycle Length, C	70
Actual Green Time for Lane Group, G	46
Effective Green Time for Lane Group, g	48
Opposing Effective Green Time, go	48
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	206
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	4.01
Adjusted Opposing Flow Rate, Vo	392
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	7.62
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.31
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	3.13
gu=g-gq (or g-gf)	44.88
fs=(875-0.625Vo)/1000	0.63
Pl=Plt[1+((N-1)g/(fs*gu+4.5))]	1.00
El1	2.56
fmin	0.08
fm,(min=fmin;max=1.00)	0.36
flt=[fm+0.91(N-1)]/N	0.36

HCS: Signalized Intersection Version 2.4d 05-04-1998 4

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-1NOB.HC9
Area Type: Other 10-1-97 11:15am
Comment: No Build Forecast AM peak hour

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
T	392	1810	0.217	0.686	1241	0.316
R	294	1538	0.191	0.686	1055	0.279
WB						
L	206	630	0.327	0.686	432	0.477 *
T	432	1727	0.250	0.686	1184	0.365
NB						
L	197	1671	0.118	0.229	382	0.516 *
R	170	1495	0.114	0.229	342	0.497
SB						

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.445
Critical v/c(x) = 0.487

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
T	0.316	0.686	3.4	1.000	1241	16	0.1	3.4	A	3.4	A
R	0.279	0.686	3.2	1.000	1055	16	0.0	3.3	A		
WB											
L	0.477	0.686	3.9	1.000	432	16	0.7	4.6	A	3.9	A
T	0.365	0.686	3.5	1.000	1184	16	0.1	3.6	A		
NB											
L	0.516	0.229	17.9	1.000	382	16	1.0	18.9	C	18.9	C
R	0.497	0.229	17.9	1.000	342	16	1.0	18.8	C		
SB											

Intersection Delay = 6.9 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

Intersection: US460/VA83 and VA83
Time period: 11:15am

VA83

Volumes
SB Total
0

0 0 0
<ì v â>
0 0 0

0
410 WB Total
606
196

Legend
[X] = Level of Service
#áì = No. of Lanes
Dáì = De facto Turn

<áááá 1
[A] Öáááá 1

Intersection
[B]

1 áááá> [A]
1 áááá¢ [A]

US460/VA83

[C] [C]
<¢ Ö>

0^
ááááì
EB Total 372
671 ááááá>
299
ááááá¢

187 0 177
<¢ ^ Ö>
1 1

364
NB Total

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4d 05-04-1998
BMI

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-2NOB.HC9
Area Type: Other 10-1-97 4:30 pm
Comment: No Build Forecast PM peak hour

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1		1		1			
Volumes		427	356	319	554		371		211			
Lane W (ft)		12.0	12.0	12.0	12.0		12.0		12.0			
RTOR Vols			20			0			15			
Lost Time		3.00	3.00	3.00	3.00		3.00		3.00			

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	51.0P							
Yellow/AR	5.0							

NB	Left	*
	Thru	
	Right	*
	Peds	
SB	Left	
	Thru	
	Right	
	Peds	
EB	Right	
WB	Right	
Green	19.0P	
Yellow/AR	5.0	

Cycle Length: 80 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	T	1199	1810	0.374	0.663	4.7	A	4.7	A
	R	1019	1538	0.347	0.663	4.6	A		
WB	L	326	492	1.031	0.663	57.7	E	24.6	C
	T	1144	1727	0.510	0.663	5.6	B		
NB	L	439	1671	0.891	0.262	35.6	D	30.3	D
	R	392	1495	0.525	0.262	20.2	C		

Intersection Delay = 19.2 sec/veh Intersection LOS = C
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.991

HCS: Signalized Intersection Version 2.4d 05-04-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-2NOB.HC9
Area Type: Other 10-1-97 4:30 pm
Comment: No Build Forecast PM peak hour

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1		1		1			
Volumes		427	356	319	554		371		211			
PHF or PK15		0.95	0.95	0.95	0.95		0.95		0.95			
Lane W (ft)		12.0	12.0	12.0	12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		5	5	10	10		8		8			
Parking	(Y/N) N			(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					
Arr Type		3	3	3	3		3		3			
RTOR Vols			20			0			15			
Lost Time		3.00	3.00	3.00	3.00		3.00		3.00			

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left *			
Thru	*				Thru			
Right	*				Right *			
Peds					Peds			
WB Left	*				SB Left			
Thru	*				Thru			
Right					Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	51.0P				Green 19.0P			
Yellow/AR	5.0				Yellow/AR 5.0			

Cycle Length: 80 secs Phase combination order: #1 #5

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-2NOB.HC9
Area Type: Other 10-1-97 4:30 pm
Comment: No Build Forecast PM peak hour

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Thru	427	0.95	449	T	449	1	1.000	1.000	449	0.00	0.00
Right	356	0.95	354	R	354	1	1.000	1.000	354	0.00	1.00
WB											
Left	319	0.95	336	L	336	1	1.000	1.000	336	1.00	0.00
Thru	554	0.95	583	T	583	1	1.000	1.000	583	0.00	0.00
NB											
Left	371	0.95	391	L	391	1	1.000	1.000	391	1.00	0.00
Right	211	0.95	206	R	206	1	1.000	1.000	206	0.00	1.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
T	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1810
R	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1538
WB											
L	1900	1	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.28	492
T	1900	1	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1727
NB											
L	1900	1	1.00	0.93	1.00	1.00	1.00	1.00	1.00	0.95	1671
R	1900	1	1.00	0.93	1.00	1.00	1.00	1.00	0.85	1.00	1495

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-2NOB.HC9
Area Type: Other 10-1-97 4:30 pm
Comment: No Build Forecast PM peak hour

Supplemental Permitted LT Worksheet

APPROACH	WB
Cycle Length, C	80
Actual Green Time for Lane Group, G	51
Effective Green Time for Lane Group, g	53
Opposing Effective Green Time, go	53
Number of Opposing Lanes, No	1
Number of Lanes in Lane Group, N	1
Adjusted Left-Turn Flow Rate, Vlt	336
Proportion of Left Turns in Lane Group, Plt	1.00
Left Turns per Cycle: LTC=Vlt*C/3600	7.47
Adjusted Opposing Flow Rate, Vo	449
Opposing Flow per Lane, Per Cycle: Volc=VoC/3600No	9.98
Opposing Platoon Ratio, Rpo	1
Lost time per phase, tl	3
gf=Gexp(-0.882*LTC^0.717)-tl	0.00
Opposing Queue Ratio: qro=1-Rpo(go/C)	0.34
gq = Volc * qro / (.5 - Volc * (1 - qro) / go)-tl	5.97
gu=g-gq (or g-gf)	47.03
fs=(875-0.625Vo)/1000	0.59
Pl=Plt[1+{(N-1)g/(fs*gu+4.5)}]	1.00
El1	3.11
fmin	0.08
fm,(min=fmin;max=1.00)	0.28
flt=[fm+0.91(N-1)]/N	0.28

HCS: Signalized Intersection Version 2.4d 05-04-1998 4

Streets: (E-W) US460/VA83 (N-S) VA83
Analyst: DES File Name: V5-2NOB.HC9
Area Type: Other 10-1-97 4:30 pm
Comment: No Build Forecast PM peak hour

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
T	449	1810	0.248	0.663	1199	0.374
R	354	1538	0.230	0.663	1019	0.347
WB						
L	336	492	0.683	0.663	326	1.031 *
T	583	1727	0.338	0.663	1144	0.510
NB						
L	391	1671	0.234	0.262	439	0.891 *
R	206	1495	0.138	0.262	392	0.525
SB						

Sum (v/s) critical = 0.917
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.991

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
T	0.374	0.663	4.6	1.000	1199	16	0.1	4.7	A	4.7	A
R	0.347	0.663	4.5	1.000	1019	16	0.1	4.6	A		
WB											
L	1.031	0.663	10.3	1.000	326	16	47.4	57.7	E	24.6	C
T	0.510	0.663	5.2	1.000	1144	16	0.3	5.6	B		
NB											
L	0.891	0.262	21.6	1.000	439	16	14.0	35.6	D	30.3	D
R	0.525	0.262	19.2	1.000	392	16	1.0	20.2	C		
SB											

Intersection Delay = 19.2 sec/veh Intersection LOS = C

INTERSECTION DIAGRAM

Intersection: US460/VA83 and VA83
Time period: 4:30 pm

VA83

Volumes
SB Total
0

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0 0 0

^ 0
âáááááá

554 WB Total
<áááááá 873

319
Öáááááá
v

Legend
[X] = Level of Service
^
#áì = No. of Lanes
^
Dáì = De facto Turn

<áááááá 1

[E] Öáááááá 1
v

Intersection
[C]

1 áááááá> [A]

1 áááááá¢ [A]
v

US460/VA83

[D] [C]

0^
áááááì

EB Total 427
783 áááááá>

356
áááááá¢
v

<¢ Ö>
1 1

371 0 211
<¢ ^ Ö>

582
NB Total

HCS: Signalized Intersection Version 2.4d 03-03-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 460 (N-S) 83
Analyst: DES File Name: V6-2NOB.HC9
Area Type: Other 10-2-97 11:30hr
Comment: No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1							
Volumes		120	323	170	497							
PHF or PK15		0.95	0.95	0.95	0.95							
Lane W (ft)		12.0	12.0	12.0	12.0							
Grade		0			0							
% Heavy Veh		5	5	5	5							
Parking	(Y/N) N			(Y/N) N								
Bus Stops			0			0						
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N								
Arr Type		3	3	3	3							
RTOR Vols			0			0						
Lost Time		3.00	3.00	3.00	3.00							

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru		*						
Right		*						
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	30.0P	20.0P						
Yellow/AR	5.0	5.0						

NB Left	
Thru	
Right	
Peds	
SB Left	
Thru	
Right	
Peds	
EB Right	
WB Right	
Green	
Yellow/AR	

Cycle Length: 60 secs Phase combination order: #1 #2

Streets: (E-W) 460 (N-S) 83
Analyst: DES File Name: V6-2NOB.HC9
Area Type: Other 10-2-97 11:30hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Thru	120	0.95	126	T	126	1	1.000	1.000	126	0.00	0.00
Right	323	0.95	340	R	340	1	1.000	1.000	340	0.00	1.00
WB											
Left	170	0.95	179	L	179	1	1.000	1.000	179	1.00	0.00
Thru	497	0.95	523	T	523	1	1.000	1.000	523	0.00	0.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
T	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1810
R	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1538
WB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1719
T	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1810

HCS: Signalized Intersection Version 2.4d 03-03-1998 3

Streets: (E-W) 460 (N-S) 83
Analyst: DES File Name: V6-2NOB.HC9
Area Type: Other 10-2-97 11:30hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
T	126	1810	0.070	0.367	664	0.190
R	340	1538	0.221	0.367	564	0.603 *
WB						
L	179	1719	0.104	0.533	917	0.195
T	523	1810	0.289	0.533	965	0.542 *
NB						
SB						

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.510
Critical v/c(x) = 0.567

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
T	0.190	0.367	9.8	1.000	664	16	0.0	9.8	B	12.2	B
R	0.603	0.367	11.7	1.000	564	16	1.3	13.1	B		
WB											
L	0.195	0.533	5.5	1.000	917	16	0.0	5.6	B	7.0	B
T	0.542	0.533	7.0	1.000	965	16	0.5	7.5	B		
NB											
SB											

Intersection Delay = 9.1 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

Intersection: 460 and 83
Time period: 11:30hr

83

Volumes
SB Total
0

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497 WB Total
<áááááá 667

170
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v

Legend
[X] = Level of Service
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#áì = No. of Lanes
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Dáì = De facto Turn

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[B] Öáááááá 1
v

Intersection
[B]

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v

460

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EB Total 120
443 áááááá>

323
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v

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0
NB Total

HCS: Signalized Intersection Version 2.4d 03-03-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 460 (N-S) 83
Analyst: DES File Name: V6-1NOB.HC9
Area Type: Other 10-2-97 3:30 hr
Comment: No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		1	1	1	1							
Volumes		139	323	188	500							
PHF or PK15		0.95	0.95	0.95	0.95							
Lane W (ft)		12.0	12.0	12.0	12.0							
Grade		0			0							
% Heavy Veh		5	5	5	5							
Parking	(Y/N) N			(Y/N) N								
Bus Stops			0			0						
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N								
Arr Type		3	3	3	3							
RTOR Vols			0			0						
Lost Time		3.00	3.00	3.00	3.00							

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru		*						
Right		*						
Peds								
WB Left	*							
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	30.0P	20.0P						
Yellow/AR	5.0	5.0						

NB	Left
	Thru
	Right
	Peds
SB	Left
	Thru
	Right
	Peds
EB	Right
WB	Right
Green	
Yellow/AR	

Cycle Length: 60 secs Phase combination order: #1 #2

Streets: (E-W) 460 (N-S) 83
Analyst: DES File Name: V6-1NOB.HC9
Area Type: Other 10-2-97 3:30 hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Thru	139	0.95	146	T	146	1	1.000	1.000	146	0.00	0.00
Right	323	0.95	340	R	340	1	1.000	1.000	340	0.00	1.00
WB											
Left	188	0.95	198	L	198	1	1.000	1.000	198	1.00	0.00
Thru	500	0.95	526	T	526	1	1.000	1.000	526	0.00	0.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
T	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1810
R	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1538
WB											
L	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1719
T	1900	1	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1810

HCS: Signalized Intersection Version 2.4d 03-03-1998 3

Streets: (E-W) 460 (N-S) 83
Analyst: DES File Name: V6-1NOB.HC9
Area Type: Other 10-2-97 3:30 hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
T	146	1810	0.081	0.367	664	0.220
R	340	1538	0.221	0.367	564	0.603 *
WB						
L	198	1719	0.115	0.533	917	0.216
T	526	1810	0.291	0.533	965	0.545 *
NB						
SB						

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.512
Critical v/c(x) = 0.569

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
T	0.220	0.367	9.9	1.000	664	16	0.0	10.0	B	12.1	B
R	0.603	0.367	11.7	1.000	564	16	1.3	13.1	B		
WB											
L	0.216	0.533	5.6	1.000	917	16	0.0	5.6	B	7.0	B
T	0.545	0.533	7.0	1.000	965	16	0.5	7.5	B		
NB											
SB											

Intersection Delay = 9.1 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

Intersection: 460 and 83
Time period: 3:30 hr

83

Volumes
SB Total
0

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500 WB Total
<áááááá 688

188
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v

Legend
[X] = Level of Service
^
#áì = No. of Lanes
^
Dáì = De facto Turn

<áááááá 1

[B] Öáááááá 1
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Intersection
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v

460

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EB Total 139
462 áááááá>

323
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v

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0
NB Total

HCS: Signalized Intersection Version 2.4d 03-03-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 83/460 (N-S) 83
Analyst: DES File Name: M5-1NOB.HC9
Area Type: Other 10-1-97 4:30 hr
Comment: No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		2			2		2		1			
Volumes		166			486		501		409			
PHF or PK15		0.95			0.95		0.95		0.95			
Lane W (ft)		12.0			12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		10			8		2		2			
Parking	(Y/N) Y		20	(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					
Arr Type		3			3		3		3			
RTOR Vols			0			0			30			
Lost Time		3.00			3.00		3.00		3.00			

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right								
Peds								
WB Left								
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	23.0P							
Yellow/AR	5.0							

NB	Left	*
	Thru	
	Right	*
	Peds	
SB	Left	
	Thru	
	Right	
	Peds	
EB	Right	
WB	Right	
Green		32.0P
Yellow/AR		5.0

Cycle Length: 65 secs Phase combination order: #1 #5

Streets: (E-W) 83/460 (N-S) 83
Analyst: DES File Name: M5-1NOB.HC9
Area Type: Other 10-1-97 4:30 hr
Comment: No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Thru	166	0.95	175	T	175	2	1.050	1.000	184	0.00	0.00
WB											
Thru	486	0.95	512	T	512	2	1.050	1.000	538	0.00	0.00
NB											
Left	501	0.95	527	L	527	2	1.030	1.000	543	1.00	0.00
Right	409	0.95	399	R	399	1	1.000	1.000	399	0.00	1.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
T	1900	2	1.00	0.91	1.00	0.90	1.00	1.00	1.00	1.00	3109
WB											
T	1900	2	1.00	0.93	1.00	1.00	1.00	1.00	1.00	1.00	3519
NB											
L	1900	2	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.95	3539
R	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	0.85	1.00	1583

HCS: Signalized Intersection Version 2.4d 03-03-1998 3

Streets: (E-W) 83/460 (N-S) 83
Analyst: DES File Name: M5-1NOB.HC9
Area Type: Other 10-1-97 4:30 hr
Comment: No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
T	184	3109	0.059	0.385	1196	0.154
WB						
T	538	3519	0.153	0.385	1353	0.397 *
NB						
L	543	3539	0.153	0.523	1851	0.293
R	399	1583	0.252	0.523	828	0.482 *
SB						

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.405
Critical v/c(x) = 0.446

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
T	0.154	0.385	9.9	1.000	1196	16	0.0	9.9	B	9.9	B
WB											
T	0.397	0.385	11.0	1.000	1353	16	0.1	11.1	B	11.1	B
NB											
L	0.293	0.523	6.6	1.000	1851	16	0.0	6.7	B	7.2	B
R	0.482	0.523	7.5	1.000	828	16	0.4	7.9	B		
SB											

Intersection Delay = 8.8 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

Intersection: 83/460 and 83
Time period: 4:30 hr

83

Volumes
SB Total
0

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486 WB Total
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Legend
[X] = Level of Service
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#áì = No. of Lanes
^
Dáì = De facto Turn

[B] <áááááá 2

Intersection
[B]

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83/460

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EB Total 166
166 áááááá>

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910
NB Total

HCS: Signalized Intersection Version 2.4d 03-03-1998 1

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624 (703) 847-3071

Streets: (E-W) 83/460 (N-S) 83
Analyst: DES File Name: M5-2NOB.HC9
Area Type: Other 10-1-97 8:00 hr
Comment: V5-2 No Build Forecast

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		2			2		2		1			
Volumes		177			400		304		351			
PHF or PK15		0.95			0.95		0.95		0.95			
Lane W (ft)		12.0			12.0		12.0		12.0			
Grade		0			0			0				
% Heavy Veh		10			8		2		2			
Parking	(Y/N) Y		20	(Y/N) N			(Y/N) N					
Bus Stops			0			0			0			
Con. Peds			0			0			0			0
Ped Button	(Y/N) N			(Y/N) N			(Y/N) N					
Arr Type		3			3		3		3			
RTOR Vols			0			0			30			
Lost Time		3.00			3.00		3.00		3.00			

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right								
Peds								
WB Left								
Thru	*							
Right								
Peds								
NB Right								
SB Right								
Green	23.0P							
Yellow/AR	5.0							

	5	6	7	8
NB Left	*			
Thru				
Right	*			
Peds				
SB Left				
Thru				
Right				
Peds				
EB Right				
WB Right				
Green	32.0P			
Yellow/AR	5.0			

Cycle Length: 65 secs Phase combination order: #1 #5

HCS: Signalized Intersection Version 2.4d 03-03-1998 2

Streets: (E-W) 83/460 (N-S) 83
Analyst: DES File Name: M5-2NOB.HC9
Area Type: Other 10-1-97 8:00 hr
Comment: V5-2 No Build Forecast

Volume Adjustment Worksheet

Direction/ Mvt	Mvt Vol	PHF	Adj Vol	Lane Grp	Lane Grp Vol	No. Ln	Lane Util Fact	Growth Fact	Adj Grp Vol	Prop LT	Prop RT
EB											
Thru	177	0.95	186	T	186	2	1.050	1.000	195	0.00	0.00
WB											
Thru	400	0.95	421	T	421	2	1.050	1.000	442	0.00	0.00
NB											
Left	304	0.95	320	L	320	2	1.030	1.000	330	1.00	0.00
Right	351	0.95	337	R	337	1	1.000	1.000	337	0.00	1.00

Saturation Flow Adjustment Worksheet

Direction /LnGrp	Ideal Sat Flow	No. Lns	f W	f HV	f G	f p	f BB	f A	f RT	f LT	Adj Sat Flow
EB											
T	1900	2	1.00	0.91	1.00	0.90	1.00	1.00	1.00	1.00	3109
WB											
T	1900	2	1.00	0.93	1.00	1.00	1.00	1.00	1.00	1.00	3519
NB											
L	1900	2	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.95	3539
R	1900	1	1.00	0.98	1.00	1.00	1.00	1.00	0.85	1.00	1583

Streets: (E-W) 83/460 (N-S) 83
Analyst: DES File Name: M5-2NOB.HC9
Area Type: Other 10-1-97 8:00 hr
Comment: V5-2 No Build Forecast

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
T	195	3109	0.063	0.385	1196	0.163
WB						
T	442	3519	0.126	0.385	1353	0.327 *
NB						
L	330	3539	0.093	0.523	1851	0.178
R	337	1583	0.213	0.523	828	0.407 *
SB						

Lost Time/Cycle, L = 6.0 sec Sum (v/s) critical = 0.338
Critical v/c(x) = 0.373

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
T	0.163	0.385	10.0	1.000	1196	16	0.0	10.0	B	10.0	B
WB											
T	0.327	0.385	10.7	1.000	1353	16	0.1	10.8	B	10.8	B
NB											
L	0.178	0.523	6.2	1.000	1851	16	0.0	6.2	B	6.8	B
R	0.407	0.523	7.1	1.000	828	16	0.2	7.3	B		
SB											

Intersection Delay = 8.6 sec/veh Intersection LOS = B

INTERSECTION DIAGRAM

Intersection: 83/460 and 83
Time period: 8:00 hr

83

Volumes
SB Total
0

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400 WB Total
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egend
<] = Level of Service
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áì = No. of Lanes
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áì = De facto Turn

[B] <áááááá 2

Intersection
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83/460

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304 0 351
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655
NB Total

0^
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B Total 177
177 ááááááì>

0
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BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 83 (E-W) 643
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....8:00 - 9:00 am No Build Forecast
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	1	1	0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes		159	7	33	84							
PHF		.95	.95	.95	.95					42		54
Grade		0			0					.95		.95
MC's (%)				0							0	
SU/RV's (%)				0						0		0
CV's (%)				2						0		0
PCE's				1.02						3		3
										1.03		1.03

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	170	
Potential Capacity: (pcph)	1136	
Movement Capacity: (pcph)	1136	
Prob. of Queue-Free State:	0.95	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	174	
Potential Capacity: (pcph)	1416	
Movement Capacity: (pcph)	1416	
Prob. of Queue-Free State:	0.97	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	294	
Potential Capacity: (pcph)	715	
Major LT, Minor TH Impedance Factor:	0.97	
Adjusted Impedance Factor:	0.97	
Capacity Adjustment Factor due to Impeding Movements	0.97	
Movement Capacity: (pcph)	697	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	45	697 >					
WB R	59	1136 >	893	4.6	0.4	A	4.6
SB L	36	1416		2.6	0.0	A	0.7

Intersection Delay = 1.4 sec/veh

BMI
8330 Boone Boulevard, Suite 700
Vienna, VA 22182-2624
Ph: (703) 847-3071

Streets: (N-S) 83 (E-W) 643
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....3:15 - 4:15 pm No Build Forecast
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	1	1	0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes		80	17	55	108							
PHF		.95	.95	.95	.95					27		74
Grade		0			0					.95		.95
MC's (%)				0							0	
SU/RV's (%)				0						0		0
CV's (%)				2						0		0
PCE's				1.02						3		3
										1.03		1.03

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	93	
Potential Capacity: (pcph)	1242	
Movement Capacity: (pcph)	1242	
Prob. of Queue-Free State:	0.94	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	102	
Potential Capacity: (pcph)	1533	
Movement Capacity: (pcph)	1533	
Prob. of Queue-Free State:	0.96	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	265	
Potential Capacity: (pcph)	744	
Major LT, Minor TH Impedance Factor:	0.96	
Adjusted Impedance Factor:	0.96	
Capacity Adjustment Factor due to Impeding Movements	0.96	
Movement Capacity: (pcph)	715	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	29	715 >					
WB R	80	1242 >	1038	3.9	0.3	A	3.9
SB L	59	1533		2.4	0.0	A	0.8

Intersection Delay = 1.5 sec/veh

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Streets: (N-S) 80 (E-W) Park Entrance
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....10:30 - 11:30am No Build Forecast
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes	47	20			36	53	24		18			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)							0		0			
SU/RV's (%)							0		0			
CV's (%)							2		2			
PCE's	1.10						1.02		1.02			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		66
Movement Capacity: (pcph)		1282
Prob. of Queue-Free State:		1282
		0.99

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		94
Movement Capacity: (pcph)		1546
Prob. of Queue-Free State:		1546
		0.97

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		136
Major LT, Minor TH Impedance Factor:		883
Adjusted Impedance Factor:		0.97
Capacity Adjustment Factor due to Impeding Movements		0.97
Movement Capacity: (pcph)		0.97
		852

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	25	852		4.4	0.0	A	
EB R	19	1282		2.9	0.0	A	3.7
NB L	54	1546		2.4	0.0	A	1.7

Intersection Delay = 1.4 sec/veh

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Streets: (N-S) 80 (E-W) Park Entrance
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....5:45 - 6:45 pm No Build Forecast
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	1	0	1	0	0	0
Stop/Yield			N			N						
Volumes	36	32			45	82	63		28			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)							0		0			
SU/RV's (%)							0		0			
CV's (%)							2		2			
PCE's	1.10						1.02		1.02			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		90
Potential Capacity: (pcph)		1247
Movement Capacity: (pcph)		1247
Prob. of Queue-Free State:		0.98

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		133
Potential Capacity: (pcph)		1482
Movement Capacity: (pcph)		1482
Prob. of Queue-Free State:		0.97

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		162
Potential Capacity: (pcph)		853
Major LT, Minor TH Impedance Factor:		0.97
Adjusted Impedance Factor:		0.97
Capacity Adjustment Factor due to Impeding Movements		0.97
Movement Capacity: (pcph)		829

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	67	829		4.7	0.2	A	4.2
EB R	30	1247		3.0	0.0	A	
NB L	42	1482		2.5	0.0	A	1.3

Intersection Delay = 1.6 sec/veh

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Streets: (N-S) 609 (E-W) 80
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....11:15am - 12:15pm No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes	15	61			35	0				3		26
PHF	.95	.95			.95	.95				.95		.95
Grade		0			0						0	
MC's (%)										0		0
SU/RV's (%)										0		0
CV's (%)										10		10
PCE's	1.10									1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)		37
Potential Capacity: (pcph)		1326
Movement Capacity: (pcph)		1326
Prob. of Queue-Free State:		0.98

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)		37
Potential Capacity: (pcph)		1646
Movement Capacity: (pcph)		1646
Prob. of Queue-Free State:		0.99
TH Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.99

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)		117
Potential Capacity: (pcph)		906
Major LT, Minor TH Impedance Factor:		0.99
Adjusted Impedance Factor:		0.99
Capacity Adjustment Factor due to Impeding Movements		0.99
Movement Capacity: (pcph)		896

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
SB L	3	896 >					
SB R	30	1326 >	1271	2.9	0.0	A	2.9
EB L	18	1646		2.2	0.0	A	0.4

Intersection Delay = 0.8 sec/veh

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Streets: (N-S) 609 (E-W) 80
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....12:30 - 1:30 pm No Build Forecast
Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	> 1	0	0	1	< 0	0	0	0	0	> 0	< 0
Stop/Yield			N			N						
Volumes	36	100			40	0					1	31
PHF	.95	.95			.95	.95					.95	.95
Grade		0			0						0	
MC's (%)											0	0
SU/RV's (%)											0	0
CV's (%)											10	10
PCE's	1.10										1.10	1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)		42
Potential Capacity: (pcph)		1318
Movement Capacity: (pcph)		1318
Prob. of Queue-Free State:		0.97

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)		42
Potential Capacity: (pcph)		1637
Movement Capacity: (pcph)		1637
Prob. of Queue-Free State:		0.97
TH Saturation Flow Rate: (pcphpl)		1700
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:		0.97

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)		185
Potential Capacity: (pcph)		827
Major LT, Minor TH Impedance Factor:		0.97
Adjusted Impedance Factor:		0.97
Capacity Adjustment Factor due to Impeding Movements		0.97
Movement Capacity: (pcph)		804

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
SB L	1	804 >					
SB R	36	1318 >	1296	2.9	0.0	A	2.9
EB L	42	1637		2.3	0.0	A	0.6

Intersection Delay = 0.8 sec/veh

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Ph: (703) 847-3071

Streets: (N-S) 460 (E-W) 609
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....11:15 - 12:15 No Build Forecast
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	126	211			222	78	40		112			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)	0						0		0			
SU/RV's (%)	0						0		0			
CV's (%)	1						0		0			
PCE's	1.01						1.00		1.00			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		275
Movement Capacity: (pcph)		1005
Prob. of Queue-Free State:		1005
		0.88

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		316
Movement Capacity: (pcph)		1212
Prob. of Queue-Free State:		1212
		0.89

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		630
Major LT, Minor TH		457
Impedance Factor:		
Adjusted Impedance Factor:		0.89
Capacity Adjustment Factor due to Impeding Movements		0.89
Movement Capacity: (pcph)		0.89
		406

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	42	406 >					
EB R	118	1005 >	724	6.4	1.0	B	6.4
NB L	134	1212		3.3	0.4	A	1.2

Intersection Delay = 1.8 sec/veh

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Streets: (N-S) 460 (E-W) 609
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... DES
Date of Analysis..... 10/1/97
Other Information.....3:00 - 4:00 pm No Build Forecast
Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	< 0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	140	302			299	31	30		110			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0				
MC's (%)	0						0		0			
SU/RV's (%)	0						0		0			
CV's (%)	1						0		0			
PCE's	1.01						1.00		1.00			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		332
Movement Capacity: (pcph)		940
Prob. of Queue-Free State:		940
		0.88

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		348
Movement Capacity: (pcph)		1170
Prob. of Queue-Free State:		1170
		0.87

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		
Potential Capacity: (pcph)		796
Major LT, Minor TH		366
Impedance Factor:		
Adjusted Impedance Factor:		0.87
Capacity Adjustment Factor		0.87
due to Impeding Movements		
Movement Capacity: (pcph)		0.87
		320

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	LOS	Approach Delay (sec/veh)
EB L	32	320 >					
EB R	116	940 >	662	7.0	1.0	B	7.0
NB L	148	1170		3.5	0.4	A	1.1

Intersection Delay = 1.6 sec/veh