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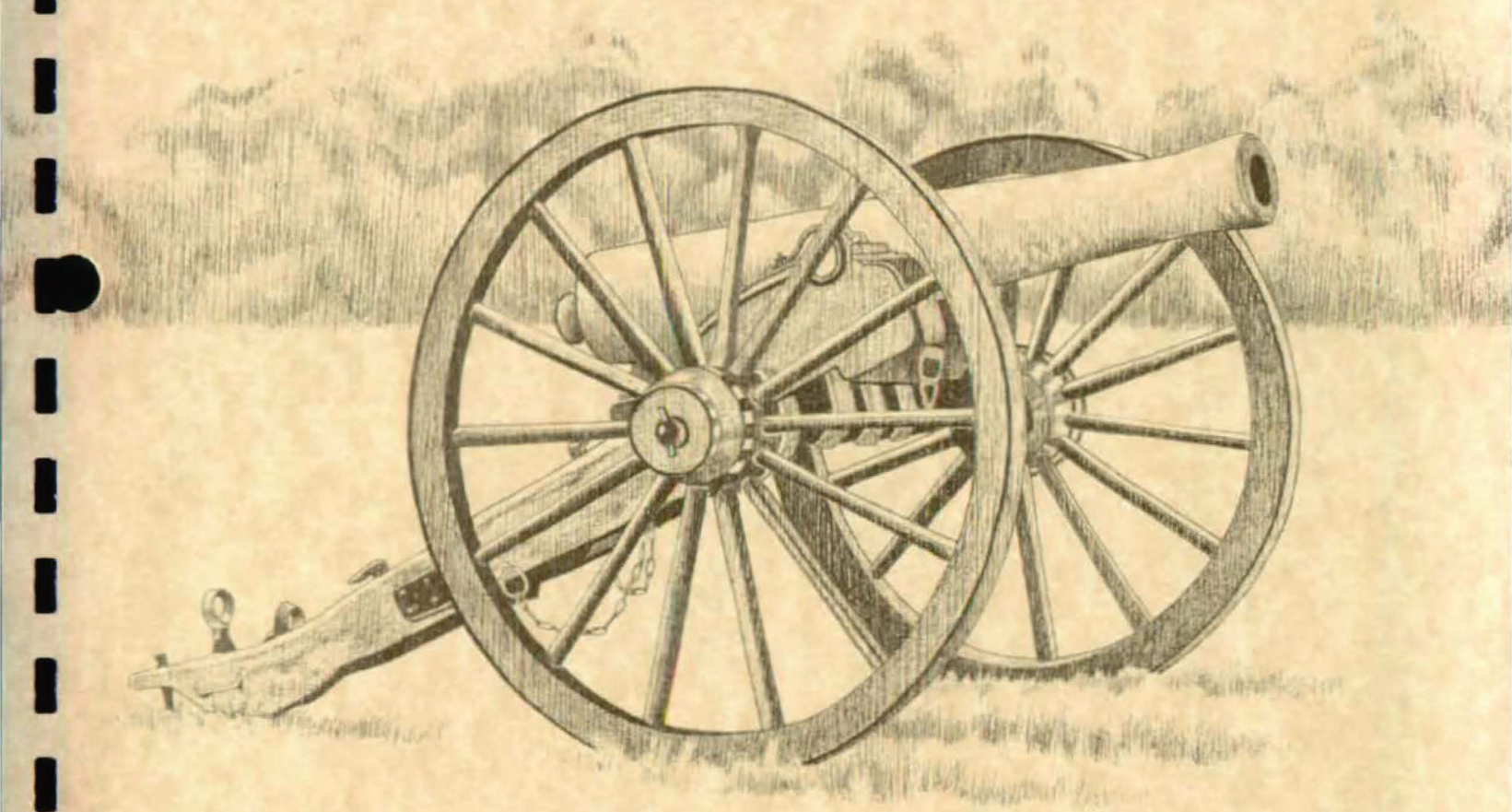
MANASSAS

NATIONAL BATTLEFIELD PARK

TRANSPORTATION STUDY



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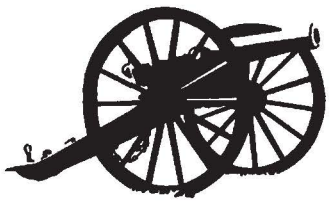

Transportation Study

Manassas National Battlefield Park, Manassas, Virginia

United States Department of the Interior
National Park Service
Denver Service Center

A/E Contract No. CX 2000-1-0011
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prepared by
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This study was prepared by Robert Peccia & Associates, Inc. under the direction of the National Park Service, Denver Service Center, Branch of Transportation. The findings and opinions contained in this document are those of the A/E, and do not necessarily represent the opinions of the National Park Service.

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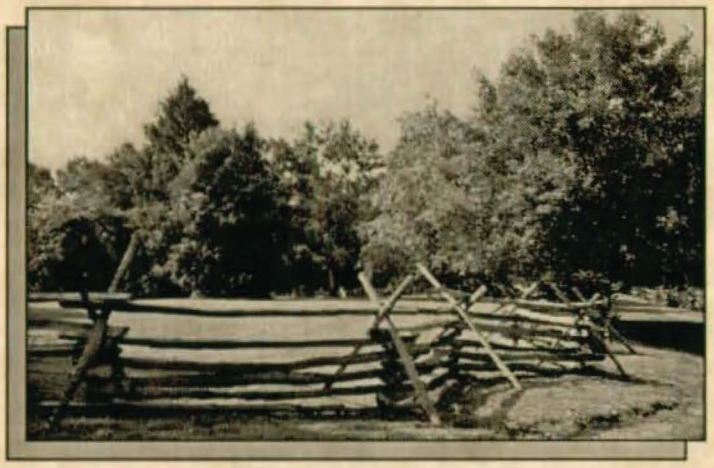
Executive Summary



Executive Summary

This study examined the operational and safety characteristics of the traffic and parking conditions within the Park. A parking utilization and duration study was conducted for all of the major parking areas within the Park. The results of this analysis is presented in Chapter 3. The findings of this study indicate that most parking areas are sized appropriately for the current parking demand. Several parking areas were identified as having capacity problems. These parking areas included the Visitor Center, the Stone House, Dogan Ridge picnic area, Battery Heights, and the Stone Bridge (west).

Traffic volume counts were collected as part of this study and are presented herein along with traffic projections developed by the Metropolitan Washington Council of Governments. The volume data indicates that US29 and VA234 are currently operating at capacity and the associated problems will continue to grow with the projected increase in traffic.

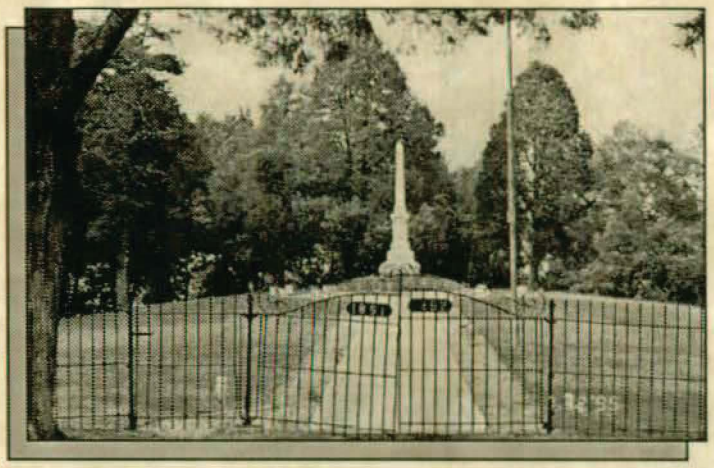
The findings of the traffic safety analysis indicates that most accidents within the Park occur on US29 and VA234. Relatively few traffic accidents occur on the internal Park roads. The accident analysis also indicates that the sections of US29 and VA234 within the Park have accident rates that are in line with similar road sections in Prince William County, Virginia.

The greatest operational problem is the signalized intersection of US 29 and VA234. The signal is currently operating at capacity during the morning, noon, and evening peak travel periods. Erratic vehicular maneuvers associated with the traffic congestion at this intersection are a safety concern. A discussion on the operation of the signal and recommended improvements are included in Chapter 4 of this report.

Chapter 7 contains an examination of 17 individual sites within the Park. These sites were examined with respect to proper traffic operation and safety. Both short- and long-term improvements are recommended to correct problems identified at these sites. Cost estimates have also been provided. In many cases modifications to the roads and parking areas within the Park will impact the adjacent battlefield landscape. Therefore, care and proper judgment must be exercised during the implementation of the proposed improvements in order to protect the historic nature of the Park.

A noise assessment and vibrations testing were conducted as part of this study. The results of these analyses are documented in a companion report that was produced with this Transportation Study report.

Chapter 1: Introduction



Chapter 1: Introduction

1.1 Project Purpose and Goals

The purpose of this study is to assist the National Park Service (NPS) and Manassas National Battlefield Park in evaluating the current traffic conditions at the Park. This data gathering effort is important in addressing immediate traffic-related problems at the Park and for future analysis of possible long-term solutions. This study is also intended to be used along with other management tools in determining Park policy.

Specific goals of this project include the following:

- define the physical and operational characteristics of the Park road system;
- analyze the effectiveness of the traffic signal at the intersection of VA234 and US29;
- analyze the traffic accident history on Park roads over the past four years;
- identify and examine 17 locations within the Park that have possible safety problems or operational problems;
- develop a set of recommended improvements that address identified traffic safety or operational problems at the 17 individual sites;
- inventory all Park road signs and approach signing;
- quantify the noise impacts generated by traffic traveling on Park roads; and
- quantify the traffic-generated vibration impacts on the Stone House.

1.2 Project Study Area

Manassas National Battlefield Park is located in northern Virginia in Fairfax and Prince William Counties. The Park consists of approximately 5,100 acres of rolling terrain. The principal access routes to the Park include US29, which traverses the Park from northeast to southwest, and VA234, which runs north and south through the Park. The intersection of these two routes is close to the geographic center of the Park. Gateway communities to the Manassas Battlefield include Manassas to the south, Centerville to the east, and Gainesville to the west. These towns and the surrounding region are considered to be, at least in part, bedroom communities of the Washington D.C. metropolitan area. A map showing the regional location of the Park is presented in FIGURE 1-1.

1.3 Historical Perspective

US29 (Warrenton Turnpike) and VA 234 (Sudley Road) have been located in the same general location since before the Civil War. These roads were used by Union and Confederate troops to access the battle sites in the vicinity during the war. Since that time these two roads have been upgraded. They are currently two-lane paved roads which continue to provide for the transportation needs in this area.

Development pressures near the Park are intensifying as the rural and agricultural uses of the region are displaced by residential and commercial developments resulting from the expansion of the Washington, D.C. metropolitan area. From 1980 to 1990, the local population nearly doubled. In Prince William County the population increased from 144,000 in 1980 to 215,000 by 1990. In addition, construction-related truck traffic through the Park has increased dramatically and is considered to be directly connected to the growth in residential and commercial developments in the area. A substantial portion of this truck traffic is being generated by three major quarry operations located near the Park.

The traffic-related problems at the Park were recognized by Congress, which passed the Manassas National Battlefield Park Amendments of 1988. This legislation requires the National Park Service (NPS), the Commonwealth of Virginia, Fairfax and Prince William Counties, and the Federal Highway Administration (FHWA) to study alternatives that would allow for the closure of US29 and VA234 through the Park. This mandate also authorized $30 million for the construction of alternative routes. Unfortunately, funding for the transportation study has not been available until this time. This study begins to address the mandate by providing baseline traffic information and data relating to the existing conditions at the Park.

1.4 Regional Planning Efforts

There are several other planning efforts and on-going construction projects that are occurring during the same general time as this project.

<u>NPS Planning Efforts</u>

- Manassas National Battlefield Park - General Management Plan (GMP) - The current GMP was completed in September 1983. In the GMP it is mentioned that the Park will work with the state, counties, and private land owners to develop land use and development plans that are conducive to maintaining the Historic scene at the Park. Traffic problems and proposed modifications to the state routes within the Park were not addressed in the GMP.

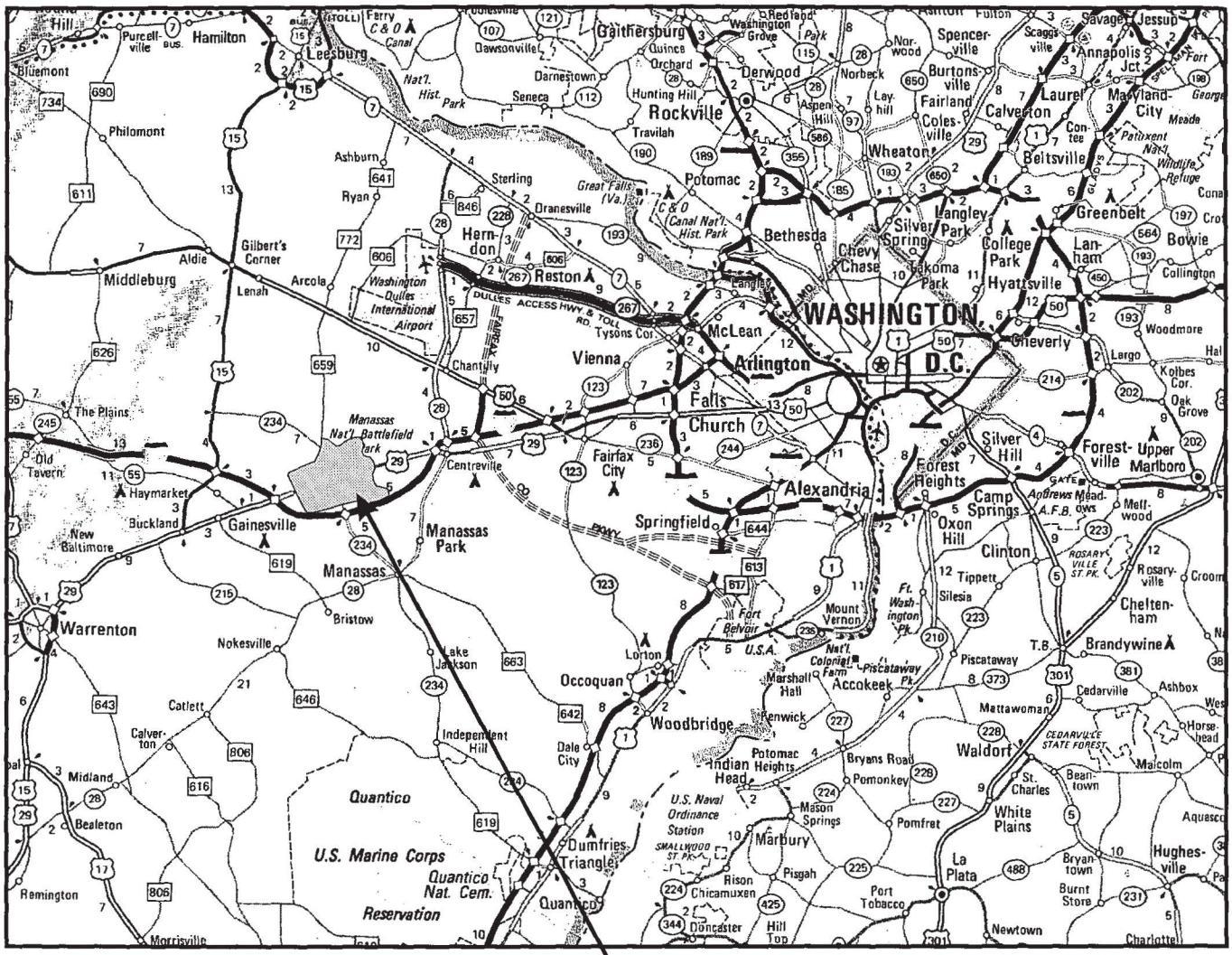


Figure 1-1:
Study Area Location

Not To Scale

Manassas National Battlefield Park, Transportation Study

- The 1983 GMP is being revised at the present time. Information from the 1983 plan will be used in the development of resource protection and visitation use alternatives. As part of the revision, a survey of visitors to the Park was conducted in 1994 to further understand visitor patterns, perceptions of the Park, and ideas about the future of the battlefields.

VDOT Plans and Projects

- Current I-66 Construction Project - VDOT and the FHWA are in the process of adding two additional lanes in each direction on I-66 between VA50 and VA234. Construction is expected to be completed in 1996.

- VA234 By-Pass Plan - This Plan was developed in the late 1970's and approved by VDOT in 1980. The Final Environmental Impact Statement (EIS) was completed in January of 1981. The Plan recommended a new alignment for VA234 that swings to the west of the City of Manassas and the Park, beginning near VA649 south of Manassas and connecting into VA234 at Catharpin. The By-Pass would consist of a four lane limited access roadway constructed within a six lane right-of-way corridor. In August of 1982 Prince William County revised their Comprehensive Plan to include the 234 By-Pass. In September 1993, VDOT modified the Plan by only progressing the portion of the By-Pass that is south of I-66 to final design. The By-Pass project now includes only the section to the west of Manassas between VA649 and I-66. The portion of the By-Pass that lies between I-66 and VA234 at Catharpin (west of the Park) has been removed from consideration and will be re-evaluated as a separate project when the purpose and need are established. A Final Supplemental EIS re-examined the project in 1993 and was approved in July of 1994. The NPS has been in support of the 234 By-Pass north of I-66 since it was originally proposed and is still shown on the County's Comprehensive Plan.

- Intersection of US29 & VA234 - This intersection has been studied repeatedly over the past two decades. In 1984 the NPS began meeting with VDOT to discuss possible improvements to the intersection. In 1985 VDOT completed a study of the intersection and recommended increasing the number of lanes at the intersection from eight to 14. They recommended dedicated left turn lanes on all approaches and right turn lanes on two of the approaches to the intersection. The NPS rejected the proposed modifications to the intersection on the grounds that the intersection widening would destroy or otherwise compromise the historic scene of the National Battlefield.

- Truck Restriction Study on Pageland Road - VDOT conducted a truck restriction study of Pageland Road between VA29 and VA234 at the request of the local

residents. The Park did not support the proposed truck restriction fearing that it would force more trucks to travel through the Park. The truck restriction proposal was not implemented.

- Metropolitan Washington D.C. Council of Governments (MWCOG) - The MWCOG is responsible for major regional land use and transportation planning in the metropolitan Washington area. The MWCOG produces the regional traffic projections for the portion of Northern Virginia that contains the Park. The MWCOG also produces a Constrained Long Range Plan (CLRP). This Plan includes the transportation projects that are scheduled to occur in the area within the period between 1996 and the year 2020. The CLRP includes the following projects:

  * VA234 By-Pass (described previously in this section) - The anticipated completion dates of this project are 1999 for the section between I-66 and VA28, and the year 2010 for the section between VA28 and VA234 south.

  * Tri-County Parkway/Loundoun Parkway Study - This project includes the study of a possible four lane facility between I-66, west of Centerville, and the Dulles Toll Road Extension/VA607 interchange currently under construction. The anticipated completion date of the study is unknown.

  * I-66 Major Investment Study - This project involves a study undertaken to determine the design concepts and scope of the investments needed in the I-66 corridor from VA17 in Fauquier County to the Capital Beltway (I-495) in Fairfax County. The study will analyze transit options including commuter rail, transit bus service, and high occupancy vehicle options. This study will also evaluate alternative alignments for US29 around the battlefield. The anticipated completion date of the study is 1997.

  * I-66, between VA234 and US29 - This project includes a conceptual engineering study of I-66 beginning 0.8 miles west of VA234 (at the future VA234 By-Pass interchange) and extending to the US29 interchange in Gainesville. The concept under consideration includes widening I-66 from four lane to eight lanes. The facility would operate as a conventional eight lane roadway during non-peak periods. During peak periods the median lanes would be restricted and operate as High Occupancy Vehicle (HOV) lanes. This project would include modifications to the I-66 interchanges at VA234 and US29. Funding has been obtained for this project but the decision to continue with the effort is pending the outcome of the I-66 Major Investment Study.

* I-66, between US29 and VA15 - This project is a conceptual engineering study that examines the widening of I-66 between US29 and VA15. The widening would enlarge the existing four lane facility to six lanes. During peak hours the two median lanes would operate as HOV lanes. The anticipated completion date for this study is 1997.

Private Development Plans and Proposals

- "Disney's America" - A major theme park and associated commercial and residential development was proposed by the Disney Corporation in 1993. The development was proposed for a site located about 5 miles west of the Manassas Battlefield, near Haymarket, Virginia. During the period between 1992 and 1994 the development proposal was under intense study. The traffic analysis concluded that the traffic generated by the proposed development would have significant impacts on the main roads in the area including the roads and intersections within the Park. Disney withdrew their proposal in September of 1994.

- Nissan Pavilion - A major concert amphitheater was proposed in the early 1990's for a site immediately south of Gainesville, Virginia. This proposal was studied by Prince William County and VDOT. Their studies indicated that although most of the traffic generated by the Pavilion would use I-66, traffic impacts would occur within the Park on concert evenings at the Pavilion. At the completion of the planning process the Nissan Pavilion was approved and constructed. The first concert was held in June of 1995. The Pavilion is a partially indoor and partially outdoor amphitheater that holds between 20,000 and 25,000 people. The Pavilion is scheduled to hold up to 60 concerts between May and October each year. The majority of the concerts are to begin at 8:00 p.m. The owners of the Pavilion have the option to expand facility to 30,000 people and 100 concerts per season. It will be important to monitor traffic volumes on roadways nearby the pavilion including Park roads before and after performances.

Chapter 2: Physical Characteristics

Chapter 2: Physical Characteristics

2.1 Regional Travel Patterns

The vehicular travel patterns in the region are greatly affected by the Washington D.C. metropolitan area. Commuter traffic flows to and from the major employment centers near Washington on I 66 and on US29. The predominant commuter traffic flow is eastbound in the morning and westbound during the evening peak travel hours. State routes VA15 and VA234 carry the north-south traffic which connect to the major east-west routes (I-66 and US29). VA234 acts as the principal connection between the City of Manassas, I-66, and US29. FIGURE 1-1 presented in Chapter 1 shows the major roads in the region.

Within the Park the regional traffic flows vary throughout the day. During the morning peak period eastbound traffic on US29 and northbound on VA234 are heavy. During midday the traffic flow is mixed and reasonably balanced. In the evening the commuter traffic returns from the Washington area in the westbound direction on US29.

2.2 External Park Guidance Signs

Over a dozen guidance signs have been placed on the major roads leading to the Park. Guidance signs are present on I-66, US29, VA234, and VA28. A review of the external guidance signing indicates that the current signing is appropriate and effective. A summary of the guidance signing is presented in Appendix D of this report.

2.3 Developed Sites within the Park

The developed areas within the Park consist of 12 major interpretive sites. The locations of these sites are shown in FIGURE 2-1. The major interpretive sites area numbered in FIGURE 2-1. These numbers represent the recommended order that the sites should be viewed when taking the driving tour of the Park. The largest and most frequented site is the Visitor Center. The Stone House is one of the most historically significant structures within the Park. The Stone House is located immediately adjacent to the intersection of US29 and VA234. The other interpretive areas are scattered throughout the Park. These areas are used to describe the battles and troop movements that took place in the area during the Civil War.

2.4 Park Road Network

The roads within the Park are also presented in FIGURE 2-1. The major roads within the Park are US29 and VA234 which intersect near the geographic center of the Park. Both of these roads are paved, two-lane facilities that carry the large majority of traffic passing through the Park.

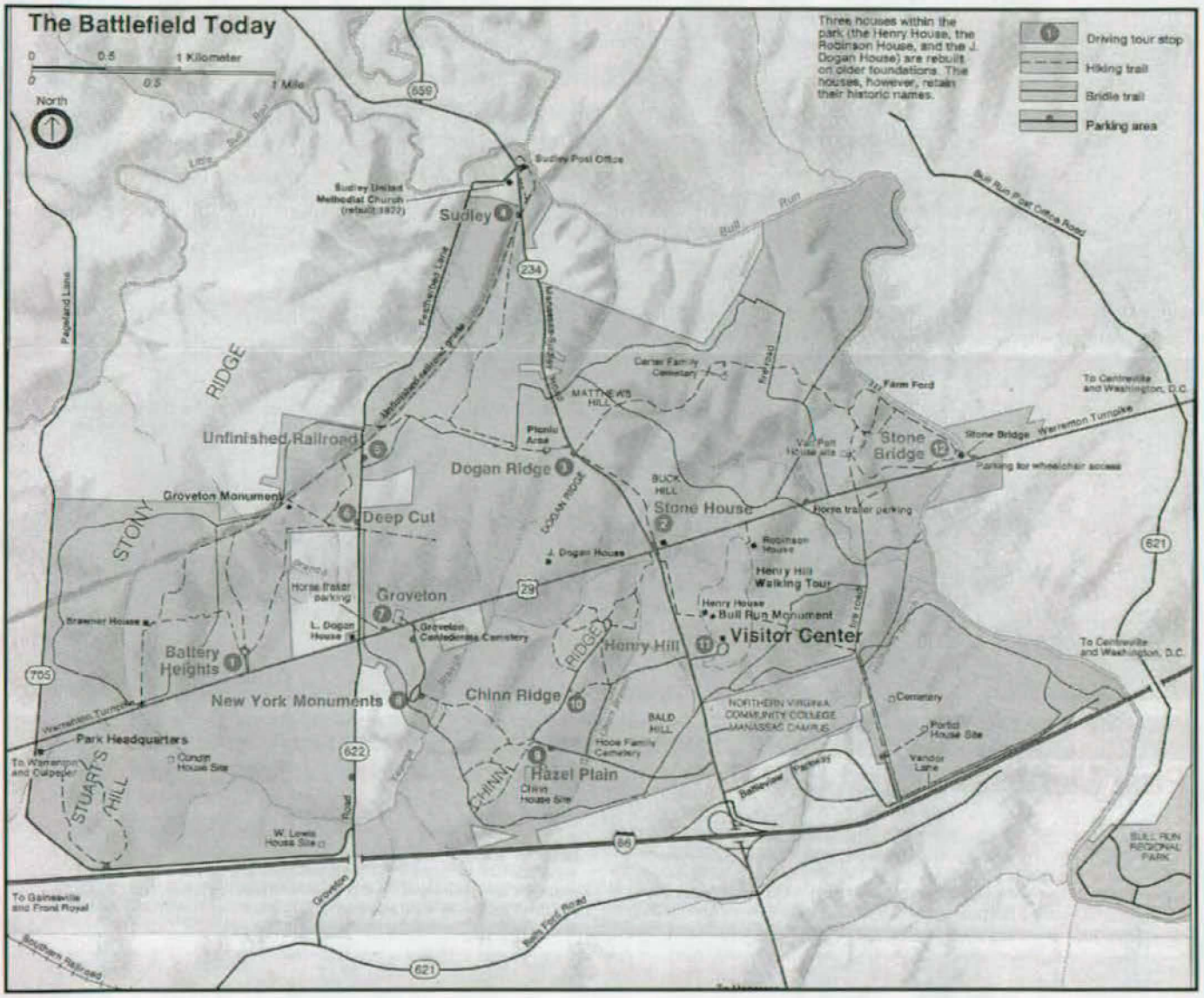


Figure 2-1: Developed Park Features

Not To Scale

Manassas National Battlefield Park, Transportation Study

Two other state routes pass through the Park in a general north-south direction. Pageland Lane (VA705) is located along the western edge of the Park. Pageland intersects US29 and extends to the north connecting with VA234 several miles north of the Park. Pageland, south of US29, wraps around the southwest corner of the Park and connects with the other state route, Groveton Road (VA622). Pageland is a two-lane road that is paved in all areas except for a half mile section immediately south of US29. VA622 is named Groveton Road on the portion south of US29 and called Featherbed Lane on the portion north of US29. Groveton Road is a paved two-lane road and crosses over I-66 to the south of the Park. Featherbed Lane connects with VA234 near the northern boundary of the Park. Most of Featherbed Lane is a gravel two-lane road except for a half mile paved section just north of US29.

There are several other internal Park roads. These roads provide access to the various interpretive areas within the Park. Short paved two-lane segments of Park road connect the Visitor Center, and the New York Monuments, with the major state routes. A short, paved, one-lane road provides access to Battery Heights. An internal road system provides access to the Chinn Ridge and Hazel Plain areas of the Park. These internal roads are paved two-lane facilities. All other roads within the Park are gravel service roads including the Dogan Ridge picnic area road connecting to VA234.

2.5 Hiking Trails

Within the Park are a series of maintained hiking trails. These trails allow the visitor to walk through the historic battlefields and see areas of the park that are not accessible by car. The trail system connects to all of the major interpretive sites. The established hiking trails are shown in FIGURE 2-1.

These hiking trails cross the cross the major roads at several locations. The crossings are located east of the Horse Trailer Lot on US29, at Dogan Ridge and Sudley on VA234, at the S29/VA234 intersection, at Deep Cut and the Unfinished Railroad on Featherbed Lane, at US 29 and Groveton/Featherbed, south of VA234/US29 intersection, and US29 west of Stone Bridge.

2.6 Bridle Trails

Horse riding is a popular activity within the Park. The Park maintains a bridle trail system that enables riders to access many areas of the Park. Several parking areas have been designated for use by horse trailers. The parking areas at Brawner Farm, Groveton Cemetery, and the Horse Trailer Lot on US29 are regularly used as horse trailer loading areas. The bridle trails cross the major roads within the park at several locations. A bridle trail crosses US29 east of the intersection of VA622 and to the west of the Horse Trailer Lot. Bridle trails cross VA234 north of Dogan Ridge and south of the Visitor Center, US 29 at Groveton Road, and US 29 west of Stone Bridge (the Winery). A bridle trail also crosses Featherbed Lane near Deep Cut and the Unfinished Railroad.

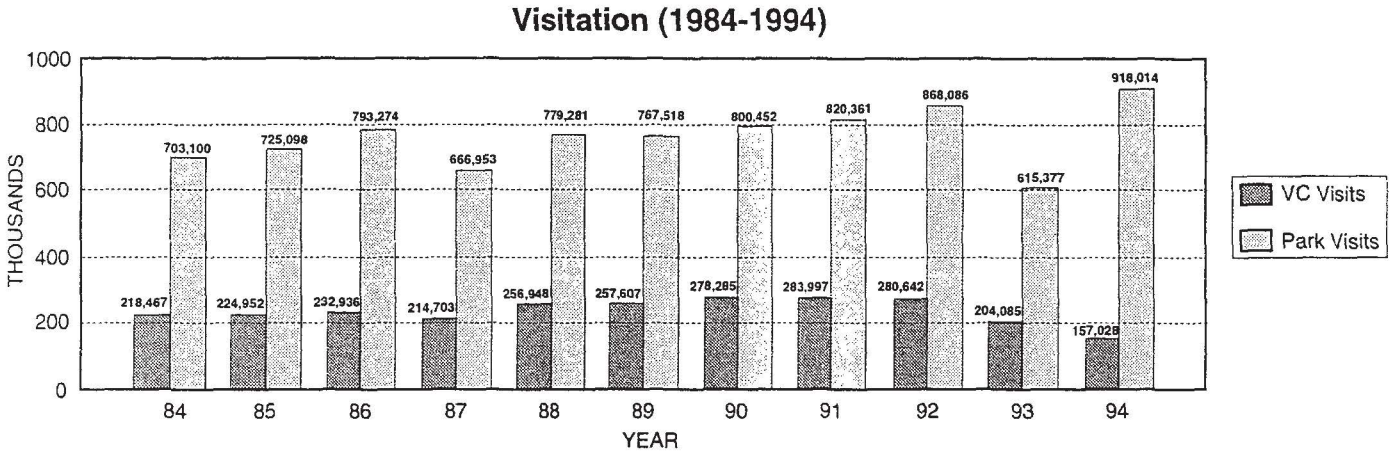
Chapter 3: Operational Characteristics

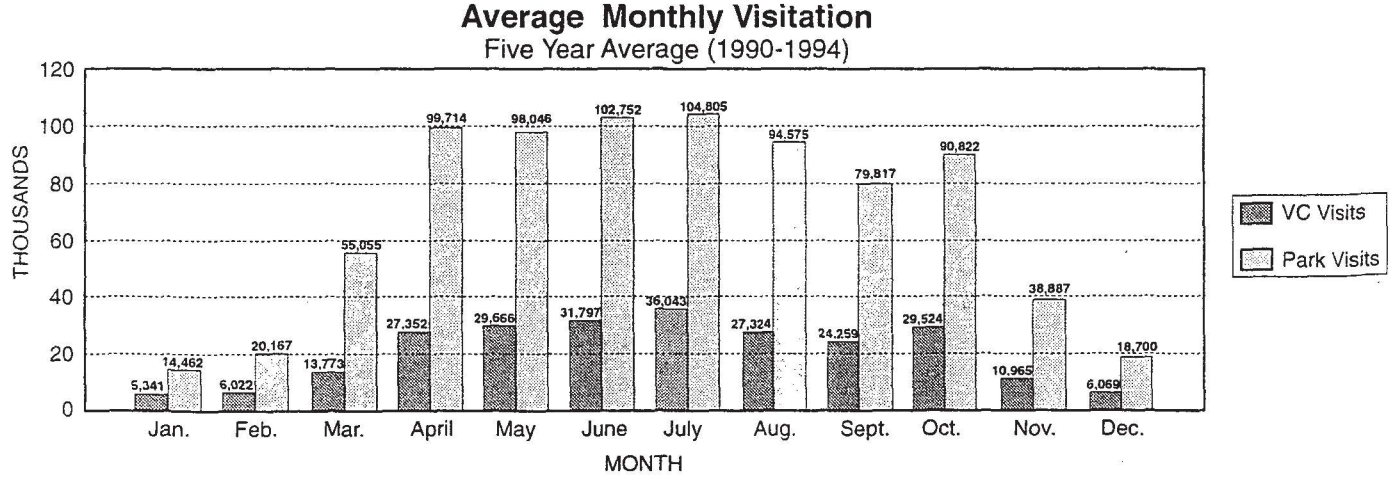
Chapter 3: Operational Characteristics

3.1 Park Visitation

The Manassas Battlefield Park had about 900,000 visitors during 1994. Annual visitation has been steadily increasing over the last decade. The Park receives the majority of its visitation during the months of April through October. The monthly visitation exceeded 100,000 during the months of June and July in 1994. FIGURE 3-1 shows the annual visitation trends and monthly variations in visitation at the Visitor Center and Park-wide.

Figure 3-1: Visitation Trends





3.2 Traffic Volumes

Traffic volume counts were taken during the months of May and July in 1995. These counts were collected in an effort to define the amount of traffic using the various roads within the Park. The traffic volumes in the Park vary from day to day during the week. FIGURE 3-4 shows the total number of vehicles that approached the US29/VA234 intersection during each day of the week of May 20, 1995. The data indicates that Mondays have the highest volumes, while the other four weekdays receive about the same volume of traffic. Volumes on weekend days are significantly lower than weekdays, with Sundays being the day with the lightest volume.

Figure 3-2: Volume Variations During The Week
Intersection of US 29 & VA 234

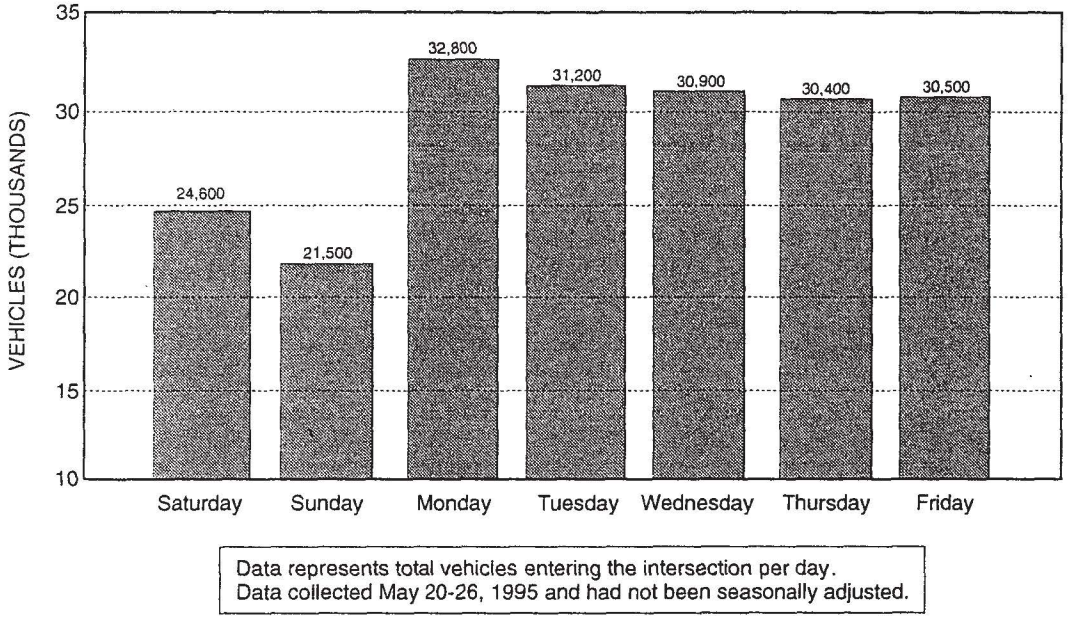
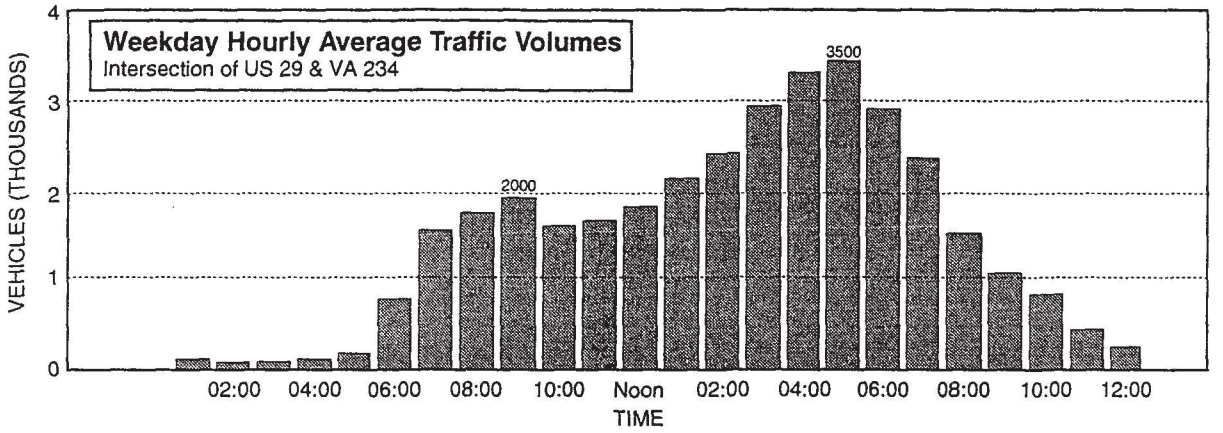
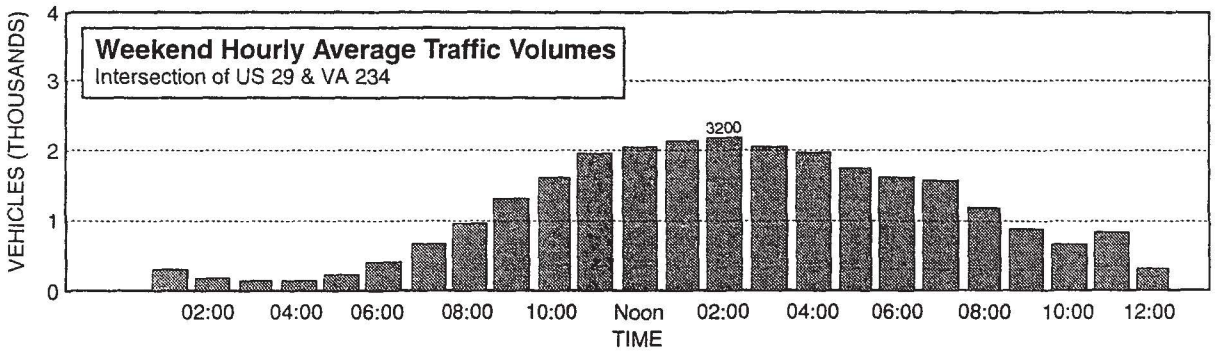


FIGURE 3-3 shows how the traffic volumes vary during the day. The figure indicates the hourly volume variations that occur on an average weekday, and on an average weekend day. The data shows the dramatic differences in traffic demand during the day. The weekday data shows well pronounced peaks at 9:00 a.m and 5:00 p.m. The weekend volumes increase steadily up to 2:00 p.m., then decrease steadily for the remainder of the day. The weekend volume data does not reflect the peaking trends during the morning and evening periods that are typical on weekdays.

Figure 3-3: Volume Variations During the Day



Data represents total vehicles entering the intersection per hour. Data based on counts collected May 20-26, 1995.



Data represents total vehicles entering the intersection per hour. Data based on counts collected May 20-26, 1995.

Traffic volume counts were collected during May with the intent of identifying the typical travel patterns and volumes associated with the normal commuter traffic. The July traffic counts were collected in an effort to identify any changes that resulted from tourist traffic visiting the Park, and changes in regional commuter traffic during the summer season.

FIGURE 3-4 shows the average 24-hour traffic volumes that were recorded during a seven day period in May, of 1995. The data indicates that the east leg of the US29/VA234 intersection carries the greatest traffic volume of over 19,200 vehicles per day. The south leg of the intersection carries the second largest traffic volume of over 15,100 vehicles per day. The Park roads all carry light volumes, with the Visitor Center access road having the greatest volume of 700 vehicles per day.

Similar data for a seven day period in July is presented in FIGURE 3-5. The traffic counts taken in July indicate that during the summer months there is a significant decrease in the daily traffic volumes on US29, while the volumes on VA234 appear to remain about the same as the volumes recorded in May. The reduction in traffic on US29 is believed to be due to commuters being on vacation and construction activity on I-66.

Figure 3-4:
Average Daily Traffic Volumes (May)

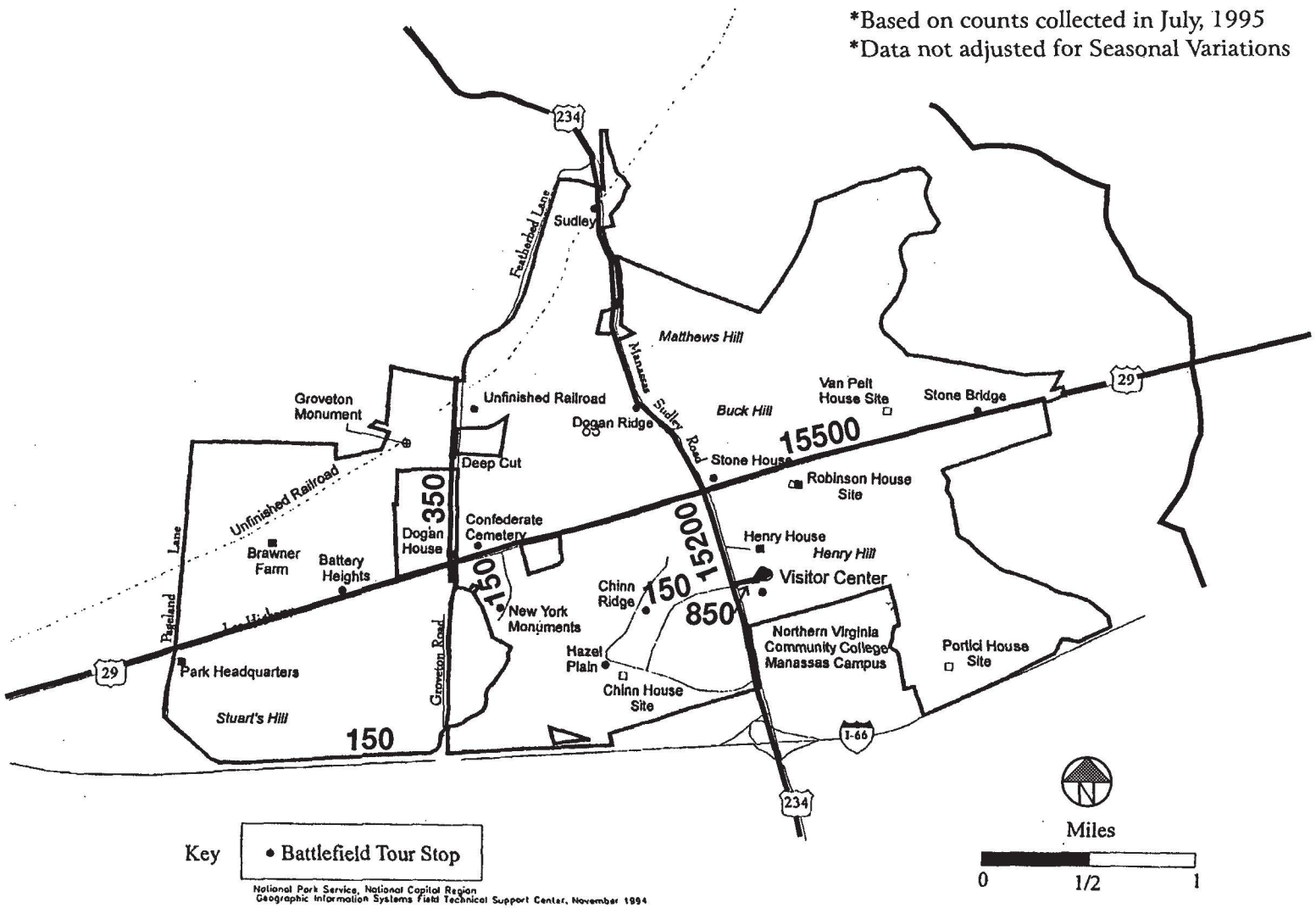
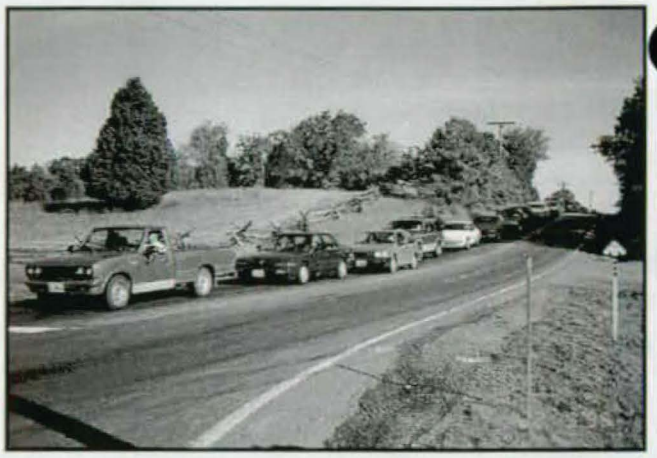
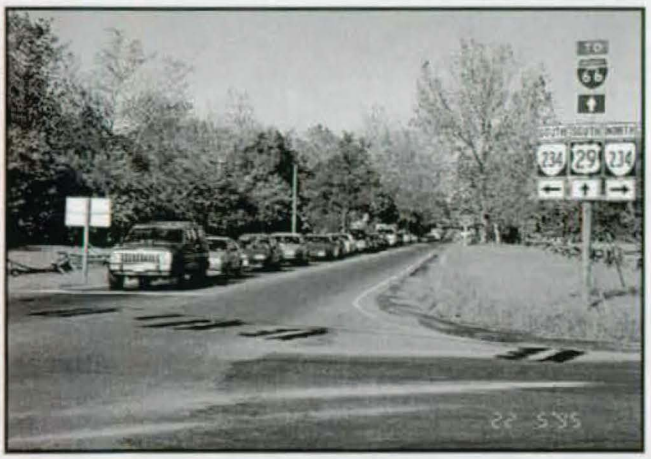


Figure 3-5: Average Daily Traffic Volumes (July)

At 7:30 a.m. on a weekday morning the traffic on the south approach to the 29/234 intersection can extend south for over a mile.



Traffic on the north approach to the 29/234 intersection backs up about a half mile during the morning and evening peak travel periods. After arriving at the back of the queue it can take over 15 minutes to pass through the signal.



The line of traffic waiting on the west approach on weekday mornings can be over two miles long. On the day this photo was taken the queue extended west to where the road widens to four lanes near the entrance to the Park.

The percentage of large trucks in the vehicle fleet that passes through the Park is abnormally high. Much of this traffic is generated by three rock quarries and a concrete plant located near the Park.

Figure 3-6: Photo Page

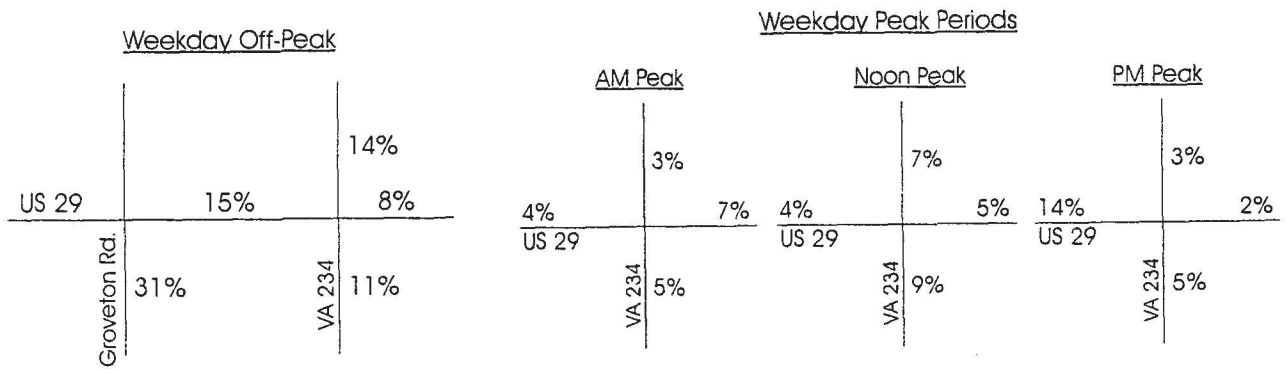
3.3 Vehicle Classification

The vehicle fleet mix is an important factor when evaluating the impacts of traffic. Field observations indicated that there is a significant amount of heavy truck traffic passing through the Park. An average semi-rural county road typically has between 3% and 5% heavy trucks, while urban roads generally have 2% - 3% heavy trucks in the fleet mix. Vehicle classification counts were conducted on the major roads within the Park during the months of May and July in 1995. The counts were collected during both peak and off-peak travel times. The results of this study indicate that heavy truck traffic comprises between 3% and 7% of the fleet during peak travel periods. During off-peak travel times, the heavy truck percentage increases to between 11% and 15% of the fleet. For the purposes of this analysis a heavy truck is defined as any truck or truck combination that has at least six tires touching the road.

FIGURE 3-7 shows the truck percentages that were recorded during the field observations. It is interesting to note that during the field observations it was noticed there were a large number of trucks using Groveton Road. This was verified with a truck count. During the off-peak periods of the day 31% of all vehicles on this road were large trucks.

The type of truck most frequently seen traveling through the Park were construction vehicles. Dump trucks hauling dirt, gravel, and asphalt were common, as were cement trucks. It is important to mention that rock quarries are located on the north, east, and south sides of the Park, and a cement plant is located near the east boundary of the Park.

Figure 3-7: Truck Percentages



3.4 Turning Movement Counts

Turning movement counts were collected at all of the major intersections within the Park. These counts were collected manually on weekdays in May and July. The turning movement data provides an indication of the turning movement demands that occur at an intersection during the peak traffic periods. This information is necessary for evaluating and understanding the operation of the intersection. A summary of the turning movement counts is presented in APPENDIX A of this report.

3.5 Level of Service Analysis (LOS)

3.5.1 Intersection LOS

All of the major intersections within the Park were evaluated to determine the current Level of Service (LOS). The Level of Service analysis is used to determine how well the intersection is functioning, given the existing lane-use configuration, traffic control and traffic volumes. The current procedures outlined in the Transportation Research Board's ***Highway Capacity Manual-Special Report 209*** were used in the evaluation of each intersection. Intersections were evaluated and rated based on how the intersection operates under current conditions. This rating method assigns LOS values ranging from A for intersections with excellent operation, to F for intersections operating at or beyond capacity. The results of the LOS analysis for the major intersections under current conditions are presented in TABLE 3-1 below:

TABLE 3-1 Intersection Level of Service

Intersection	Current Level of Service (AM/PM)
US29/VA234	F/F
US29/VA622	A/A
US29/VA705	A/A
VA234/Visitor Center Road	A/A

The LOS data indicates that all but one major intersection within the Park are operating at a good Level of Service. The only intersection that is currently operating at capacity is the intersection of US29/VA234. This intersection is actually operating under saturated conditions during the morning and evening peak hours of the weekday. The particular vehicle movements at this intersection that are at capacity include the east- and west-bound through movements on US29, left turns from the east approach, and right turns from the south approach to the intersection. The traffic signal is fully

actuated and is utilizing aggressive signal phasing and timings during the peak hours of the day.

3.5.2 Corridor LOS

An analysis was conducted to determine the Level of Service (LOS) for various segments of the major road system within the Park. The two lane segments of US29 and VA234 were analyzed. US29 was divided into two segments, east and west of the VA234 intersection. Similarly, VA234 was divided into two segments, north and south of the US29 intersection. The methods outlined in the Transportation Research Board's ***Highway Capacity Manual-Special Report 209***. The results are presented in TABLE 3-2.

TABLE 3-2 Corridor Level of Service

Two-Lane Road Segment	Level of Service (AM/PM)
US29 - East of VA234	F/F
US29 - West of VA234	E/E
VA234 - North of US29	E/E
VA234 - South of US29	E/E

The results of this analysis provides a clear indication that both of the major roads through the Park are currently operating at or over capacity during the weekday morning and evening peak periods.

3.6 Parking Utilization and Duration

The Park has provided numerous parking areas where visitors are encouraged to get out of their vehicles and see portions of the Park on foot. When evaluating parking facilities there are two primary factors to consider: 1) The utilization of the parking areas and; 2) The average duration of stay per vehicle. The parking area utilization is calculated by counting the number of vehicles parked in each parking area on a 30 minute cycle during the peak use times of the day. The utilization is expressed in terms of the average number of vehicles parked in the area. The utilization of each parking area is presented in TABLE 3-3. The data in this table represents the average number of vehicles observed in each lot on both weekdays and weekend days.

TABLE 3-3 Parking Utilization

Parking Lot Location	Estimated Capacity (Vehicle Spaces)	Average Weekend Utilization (Vehicles)	Average Weekday Utilization (Vehicles)
Visitor Center	84	37.4	39.9
Stone Bridge West #12	16	7.7	1.8
Dogan Ridge Pullout #3	24	6.1	1.8
Stone House #2	15	3.7	1.1
Groveton Cemetery #7	34	3.6	0.7
Dogan Ridge Lot	24	3.4	1.8
Chin Ridge Circle	31 (13+18)	2.6	1.1
Unfinished Railroad #5	12	2.4	1.8
Hazel Plain #9	14	1.9	1.1
Stone Bridge East	19	1.8	0.4
Battery Heights #1	8	1.2	0.4
New York Lower	10	0.8	0.1
Deep Cut #6	6	0.7	0.6
New York Upper #8	11	0.6	0.4
Sudley #4	4	0.6	0.2
Tour Stop #10	2	0.3	0.1
Brawner Farm House	15	0.2	0.8
Horse Trailer Parking	6	0.2	0.0
Stuart's Hill	9	0.1	0.6
Hooe Cemetery	2	0.1	0.0

The parking duration is a measure of how long the average vehicle stays in a particular parking area. This is determined by recording the license plate numbers of all vehicles parked in an area on a 10 minute cycle during the peak use times of the day.

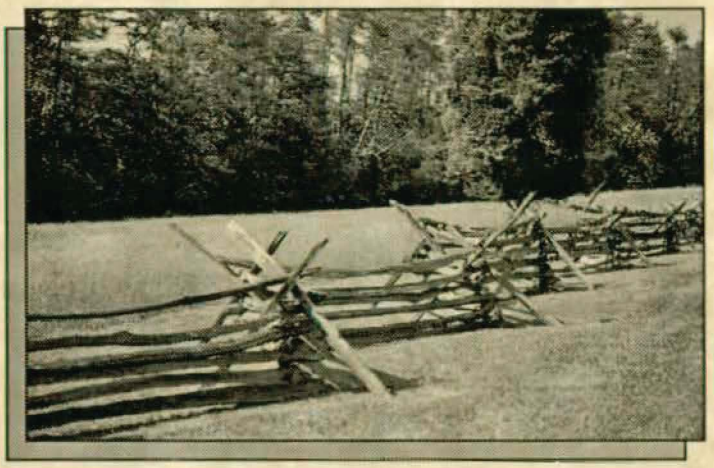
A summary of the parking lot duration study is presented in TABLE 3-3. From this data it is apparent that the Headquarters parking lot has the greatest duration of 120 minutes. This is due to

long term parking by employees. The parking areas at Groveton Heights, the Dogan Ridge Parking Lot, and the Visitor Center all have an average parking duration of at least 20 minutes.

TABLE 3-4 Parking Duration

Parking Lot Location	Average Duration (Minutes)		Parking Lot Location	Average Duration (Minutes)
Headquarters	120		Bald Hill Pullout	30
Groveton Cemetery #7	76		Chinn Ridge Circle	27
Dogan Ridge Lot	70		Horse Trailer Parking	26
Visitor Center #11	62		Stone Bridge East	25
Dogan Ridge Pullout #3	48		Hazel Plain #9	20
Stone Bridge West #12	42		Deep Cut #6	18
New York Upper #8	40		New York Lower	15
Unfinished Railroad #5	37		Stuart's Hill	13
Stone House #2	31		Sudley	10
Battery Heights #1	30		Hooe Cemetery	10
Brawner Farm House	30		Tour Stop #10	10

Chapter 4: Traffic Signal Evaluation

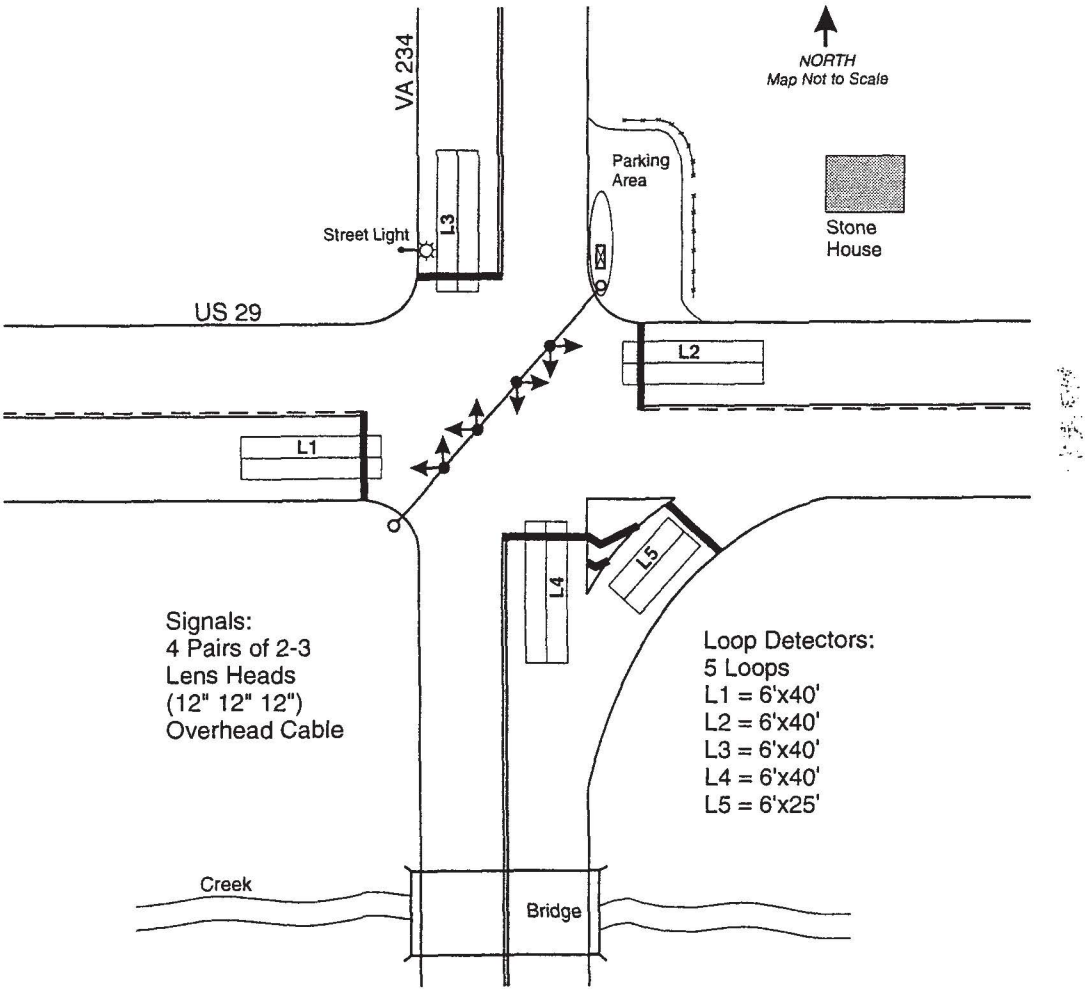


Chapter 4: Traffic Signal Evaluation

4.1 Intersection Geometrics

The only traffic signal within the Park is located at the intersection of US29 and VA234. This is a standard square four-leg intersection owned and operated by the State of Virginia. The north, east, and west approaches are simple two-lane roads with a single approach lane. No separate left or right turn lanes are provided on these three approaches. The south approach has an added right turn ramp in addition to a single through/left lane. This right turn ramp is delineated with pavement markings and does not include any raised channelization. A schematic drawing of the intersection is shown in FIGURE 4-1.

Figure 4-1: Intersection Schematic Drawing



The intersection is a standard four-legged intersection with the addition of a short right-turn ramp on the south approach. The signal heads are suspended overhead by a cable system and the traffic controller is located on the northeast corner of the intersection.

The signal phasing includes an advance green cycle for the westbound traffic during the weekday afternoon peak period. The sign mounted on the northwest corner of the intersection is the driver's only notice of this special signal phasing.

The west approach to the intersection is equipped with a sign indicating the delayed green phase in the signal cycle. The Stone House can be seen in the background of this photo.

The sign on the north approach indicates the right-of-way configuration between right-turning vehicles on the south approach and left-turning vehicles on the north approach. The sign message may be confusing to many motorists.

Figure 4-2: Photo Page

There is very little vegetation located adjacent to the intersection resulting in good sight distance from all approaches. The east and west approaches are essentially level and straight. The signal is easily visible on both of these approaches. The north approach slopes toward the intersection at about 4%. This approach consists of several curve sections near the top of the hill and a relatively straight section on the immediate approach to the intersection. The intersection is visible for at least 300 feet on the north approach. The south approach is a long straight road segment that slopes down toward the intersection at 2% - 4%. This approach includes a bridge that is located about 100 feet to the south of the intersection. The intersection and the traffic signal are clearly visible for at least 1,000 feet on the south approach.

4.2 Signal Evaluation

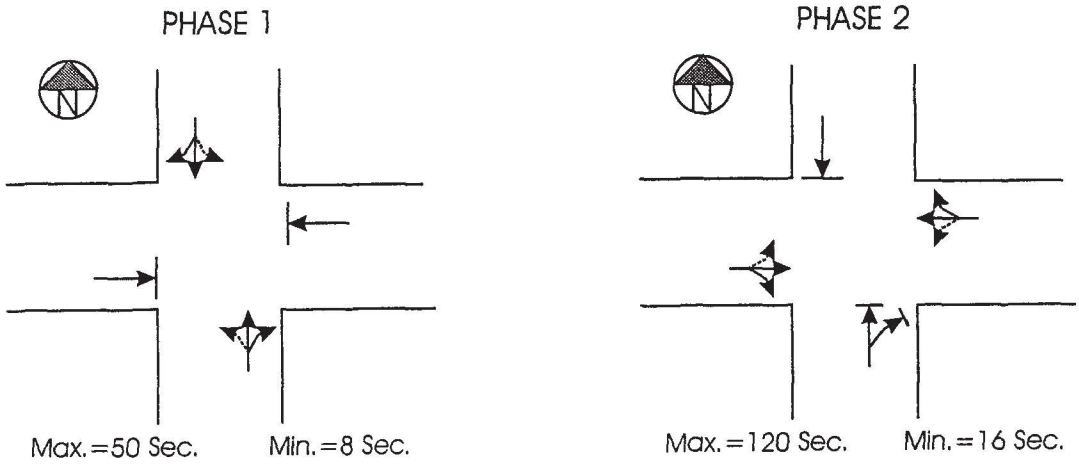
The traffic signal at the US29/VA234 intersection consists of a four-phase fully actuated controller with five inductance loops in the pavement on the intersection approaches. There is a 6' x 40' loop in each approach and a fifth loop (6' x 25') located in the right ramp on the south approach. There are eight signal heads with two facing each approach. The signal heads are suspended in pairs by a cable that stretches from the southwest corner to the northeast corner of the intersection. Each signal head has three 12-inch lenses. There are no pedestrian signal heads or push buttons at this intersection.

The controller cabinet is located on the northeast corner of the intersection. Power for the signal system is provided by an overhead power feed from a pole located on the northeast side of the intersection. The overhead feed goes to a service pole on the northeast corner and down to a meter and a main disconnect box mounted on the service pole. From there the power feed is underground to the controller cabinet.

The traffic controller is currently programmed to provide two different phasing configurations. An off-peak traffic phase configuration is used for all hours of the week except during weekday afternoons between 3:30 p.m. and 6:30 p.m. During this time on weekday afternoons the peak traffic phase configuration is used.

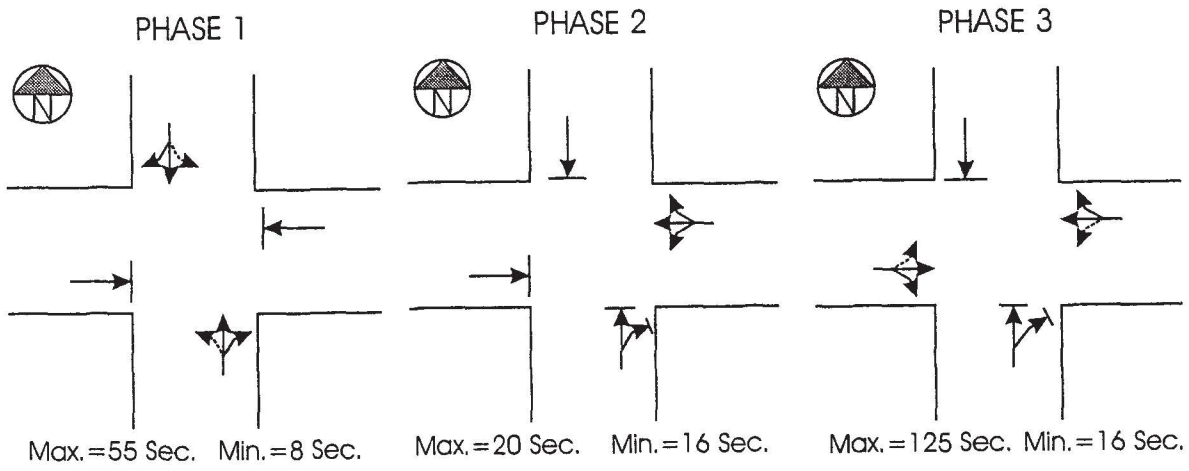
The off-peak configuration is used most of the time and consists of a two phase operation with a total maximum cycle length of approximately 182 seconds. In phase one the north-south traffic receives a maximum of 50 seconds of green time, and in phase two the east-west traffic receives a maximum of 120 seconds. The signal timing plan has a six second phase change interval consisting of four seconds of yellow and two seconds of all-red per phase.

Figure 4-3: Signal Phase Diagram - Off Peak Configuration



The timing plan also includes minimum green settings of 16 seconds for the east-west phase and eight seconds for the north-south phase. The gap interval is set at four seconds. This means that the signal will provide the minimum green time for a particular phase, then checks for vehicle presence on the green approaches (the intersection approaches with the green light). After the minimum time has elapsed in a phase, the controller monitors the green approaches for vehicle presence. If vehicle presence is not detected on either of the green approaches for a four second period, the signal will "gap out" and change to the next phase. If vehicle presence continues to be detected the signal will remain in the current green phase until the maximum phase time has elapsed.

Figure 4-4: Signal Phase Diagram - Peak Configuration



During the weekday evening peak period from 3:30 p.m. to 6:30 p.m. a peak traffic phasing configuration is used. This configuration consists of a three phase operation with a total cycle time of approximately 212 seconds. Phase one is a maximum of 55 seconds green for the north-south traffic. Phase two is 20 seconds of advance green for the west-bound traffic only, thereby providing a 20 second protected westbound left turn. Phase three begins immediately after the end of phase two with no phase change interval. This means that there is no yellow or red indication shown to the westbound traffic when the signal changes from phase two to phase three. Phase three provides 125 seconds of green time for both east- and west-bound traffic. This peak traffic phasing configuration includes four second yellow intervals and two second all-red intervals that occur at the ends of phases one and three.

The controller is programmed to provide a green indication for east-west traffic when the signal is at rest and there is no vehicle presence indicated on any approach. This is how the signal operates during the middle of the night when only a few vehicles are on the road.

4.3 Field observations

4.3.1 Signal Operation

Field observations of the traffic signal operation at the US29/VA234 intersection were made during May and July of 1995. These observations were made on every day of the week, during both peak and off-peak times of the day.

During the weekday morning peak period the signal fails to accommodate the traffic volume approaching from the south and west. Vehicle queues were seen extending south beyond the Park boundary, and west past where US29 changes to four lanes. Between 7:00 a.m. and 8:00 a.m. it can take a vehicle over 20 minutes to pass through the signal on the south approach and as much as 15 minutes on the west approach. Some minor vehicle queues form on the north and east approaches during the morning peak period. The major vehicle movements during the morning peak include the eastbound through movement and the north-bound right turn movement. Due to the large east-bound volumes and the lack of adequate gaps in traffic, the north-bound right-turn movement can usually only be performed during the green phase for north-south traffic.

During the weekday evening peak periods the traffic backs up significantly on the east approach. The vehicle queue can extend east past the Stone Bridge during this time of day. The north, south, and west approaches operate fairly well during the evening peak period with only minor vehicle queuing and delays.

The field observations are consistent with the results of the Level of Service (LOS) analysis which indicate that the intersection is over capacity (LOS-F) during the morning and evening peak periods.

4.3.2 Operational Problems

The operation of the intersection was observed and several potential problems were identified. Traffic conflicts and driver uncertainty were observed under the conditions listed below:

1. Left-turning traffic from the east conflicts with through traffic from the west at the end of the advance green phase during the evening peak period on weekdays.
The current signal phasing used during the weekday evening peak period does not warn the west-bound traffic when the left turn maneuver changes from a protected movement into a permissive movement. The signal phasing provides a 20 second advance green for the west-bound traffic. The west-bound traffic views two circular green lenses illuminated in the two signal heads facing east. There is no change in this indication when the phase changes. In the third phase the eastbound traffic receives a green indication and operates simultaneously with the westbound traffic. The conflicts and driver uncertainty occurs on the part of the left-turning vehicle from the east that can not tell if the left turn movement is protected or permissive.

2. Right-turning vehicles from the south conflict with left-turning vehicles from the north. Conflicts were noticed on the east approach where the right ramp from the south joins US29. The merge between north-bound right-turning vehicles and south-bound left-turning vehicles is confusing to drivers. Typically, at this point on a road the south-bound left-turning vehicle has completed the turn, is traveling east in the east-bound lane, and has the right-of-way, while the right-turning vehicles from the south are merging into the east-bound traffic lane and are required to yield. In actual operation right-turning vehicles from the south have been given the right-of-way to increase the capacity of the south approach and especially the right ramp. A sign has been posted on the north approach indicating "Notice - Opposing right turn traffic does not yield".

The confusion is created by the painted median island that forms the right turn ramp on the south approach. If the intersection did not have a right ramp then the right-turning vehicle from the south would obviously have the right-of-way over left-turning vehicles from the north. The presence of the right ramp normally changes the right-of-way conditions by creating a merge situation where the right-turning vehicles from the south must yield. In this case a sign posted on the north approach gives the right-of-way to the right-turning vehicles from the south. This sign has a wording that makes the meaning difficult to understand. In addition, there is no sign on the south approach that indicates the right turn traffic has the right-of-way in this situation.

3. Through traffic from the south conflicts with left-turning traffic from the north.
When the lead vehicle in the queue approaching from the south is waiting to make a left turn, through-vehicles from the south were observed becoming impatient and passing the lead vehicle on the right. This vehicle must drive over the painted median to make this maneuver. On occasion the lead vehicle from the north is simultaneously making a left turn. Under

these circumstances the drivers can not see one another clearly because of the turning vehicle from the south. The same condition of vehicles passing on the right exists when vehicles approach the intersection from the north.

It should be noted that this condition was observed during the summer of 1995. During a subsequent visit to the site in the fall of 1995 it was noticed that a series of white flexible delineators were installed along the perimeter of the painted median. These delineators appear to now make it more difficult for this conflicting traffic situation to occur.

4. The access points to the Stone House parking area create traffic conflicts and unsafe vehicle maneuvers in the immediate vicinity of the intersection. The access point on VA234 is located within 100 feet of the intersection, while the access on US29 is adjacent to the stop bar. Vehicle access and egress to this area is very disruptive to the smooth flow of traffic at this intersection.

4.4 Conclusions

1. The left most signal head on the east approach should be removed and replaced with a five-lens signal head with red, yellow, and green circular lenses, as well as yellow arrow and green arrow lenses for the left turn maneuver. Phase two should be modified to include four seconds of yellow arrow at the end of Phase two (protected left/through/right movements for westbound traffic). The increased height of the five-lens signal head will most likely require raising the height of the suspension cable across the intersection. Modifying the signal phasing and installing the new five-lens head should make it possible to remove the large "advance green" sign on the east approach.

2. The signal heads do not have sun shield back plates. These back plates should be provided on the signal heads that face east and west. The signal heads on these two approaches are difficult to see when the sun is low in the sky after sunrise and before sunset.

3. There are no provisions for pedestrian traffic at this intersection. There is a popular Park hiking trail crossing US29 at this intersection. Most pedestrians cross on the east side of the intersection. The pedestrian crossing of US29 should be relocated to a new location 200 feet east of the intersection.

4. The sign on the north approach indicating the desired right-of-way configuration is difficult to interpret. A message such as "Notice - Yield to opposing right turning vehicles" may be easier to understand.

5. The parking area for the Stone House should be relocated to another site and the current access points permanently closed.

6. The current signal timing and phasing should be modified to reduce conflicting turning movements. During the green phase for the north-bound approach, all other approaches should experience a red phase. Similarly, during the green phase for the southern approach, all other approaches should experience a red phase. Phasing for the eastern approach should include the recommended turning arrows and the western approach should retain the current signal phasing. These changes would significantly improve safety conditions at the intersection by reducing conflicting turning movements. Preliminary modeling shows that the conditions may actually improve upon completion of the I-66 project.

Chapter 5: Traffic Safety Evaluation

Chapter 5: Traffic Safety Evaluation

5.1 Accident History

The accident records for all traffic accidents occurring within the Park on US29 and VA234 between January 1, 1991 and December 31, 1994 were obtained from Virginia Department of Transportation (VDOT) and reviewed. Data about traffic accidents occurring on Park roads during the same period of time was collected from the NPS Servicewide Traffic Accident Reporting System (STARS). An analysis of these records provides background information on the accident history of the roads within the Park.

5.1.1 Accident Locations

The location of the traffic accidents is one of the most important factors relating to the accident analysis. A graphical plot of the accidents provides an easy means of identifying accident clusters that are an indication of a recurring problem at a particular location. A map showing the locations of all accidents recorded during the study period is presented in FIGURE 5-1. The data in this figure indicates that the US29/VA234 intersection has the largest accident cluster within the Park. It is interesting to note the large number of accidents that occurred on the east approach of US29 to the US29/VA234 intersection. It is suspected that many of these accidents occurred as a result of the traffic congestion caused by the intersection. The same is true for some of the accidents that occurred between the intersection and the southern boundary of the Park on VA234.

The only location on the Park road system that had a cluster of accidents was on the Visitor Center access road near the entrance to the parking area. This location was the site of four accidents during the four year study period.

5.1.2 Accident Frequency

There were a total of 250 reported traffic accidents within the Park during the four year study period. This results in an average of 63 accidents per year. The distribution of accidents throughout the four years is shown in TABLE 5-1 below.

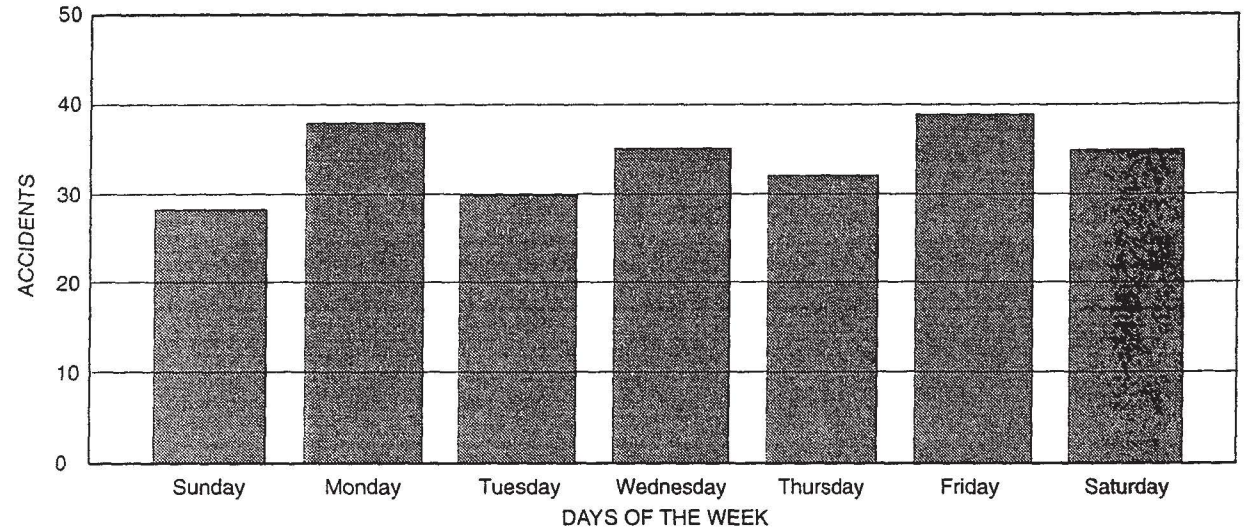
TABLE 5-1 Annual Distribution of Traffic Accidents

Location	1991	1992	1993	1994	Four-Year Total
US29	25	25	28	38	116
VA234	29	39	32	21	121
Park Roads	2	3	4	4	13
Total	56	67	64	63	250

Figure 5-1: Accident Location Map

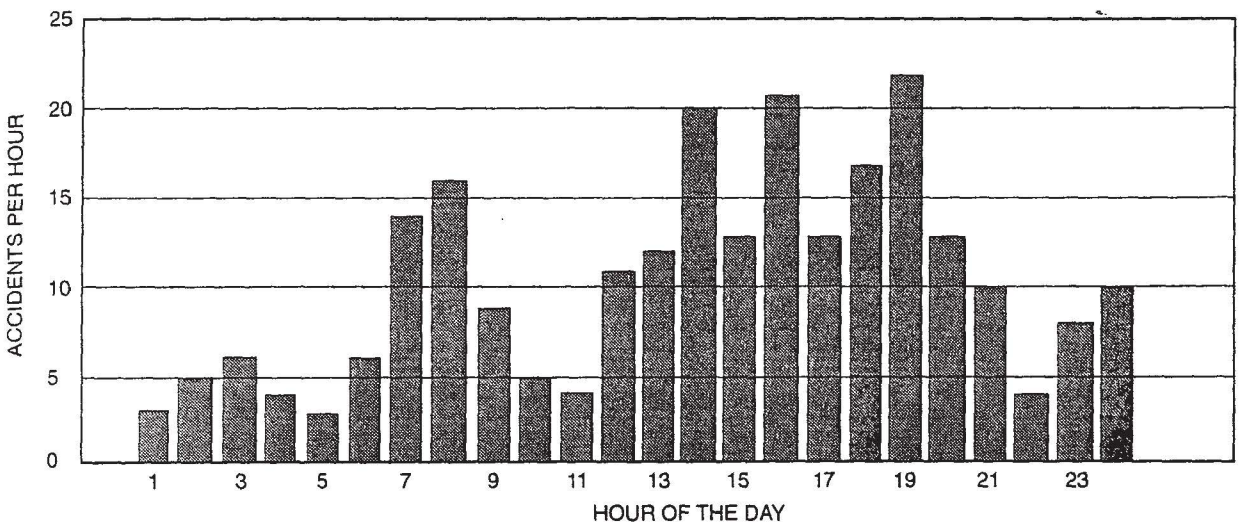
A review of the accidents, with respect to the day of the week, was performed. The results are shown in FIGURE 5-2.

Figure 5-2: Daily Distribution of Accidents (1991-1994)



A review was also made of the time of day that the accidents occurred. The results of this investigation indicate that most accidents occur during the afternoon and early evening hours. The data is shown in FIGURE 5-3.

Figure 5-3: Hourly Distribution of Accidents (1991-1994)



5.1.3 Accident Severity

During the four year study period there were two fatality accidents. One occurred in 1993 and one occurred in 1994. There were 114 injury accidents (46% of all accidents), resulting in injuries to 176 people. One of the injury accidents involved a pedestrian. In addition to the fatality and injury accidents there were 134 property-damage-only accidents (54% of all accidents).

5.1.4 Accident Rate

The accident rate compares the number of accidents that occur on a road during a period of time with the number of vehicle-miles that are traveled on the road over the same time period. The accident rate for a road segment is described in terms of accidents per million vehicle-miles traveled (Acc/MVMT). The accident rates for the major roads within the Park are shown in TABLE 5-2. The data indicates that US29 through the Park has an accident rate that is lower than the average rate for similar Primary highways in Prince William County, Virginia. The data also shows that the accident rate for VA234 through the Park is slightly higher than that of the average Secondary road in the county. The data indicates that the sections of US29 and VA234 within the Park are no more hazardous than similar roads in the county.

TABLE 5-2 Accident Rates for Road Segments

Road Segment	Accident Rate (Acc/MVMT)
US29 (within Park)	2.20
Average Primary Highway in Prince William Co.	2.54
VA234 (within Park)	3.42
Average Secondary Road in Prince William Co.	3.03

The accident rate for intersections can be determined by comparing the number of accidents that occur at an intersection with the number of vehicles that enter the intersection. The intersection accident rate is defined in terms of accidents per million vehicles entering (Acc/MVE). Any accident occurring within two tenths of a mile of the intersection on all approaches was attributed to the intersection rate. The rate for the major intersections within the Park are presented in TABLE 5-3. As a general rule, if an intersection has an accident rate that exceeds one accident per MVE, it warrants additional investigation and is considered to be a high accident location.

It is important to use caution when interpreting the accident data. It is very likely that the impacts from the congestion created at the US29/VA234 intersection extends much farther back from the intersection than the two tenths of a mile used in the accident rate calculations. If a broader view

of this intersection were taken, it is possible that many of the accidents that occurred farther from the intersection are attributable to the intersection due to the exceptionally long vehicle queues. As a result, it is believed that the accident rate for the US29/VA234 intersection is actually greater than calculations indicate. It is also believed that some of the accidents that have been attributed to the VA234/Visitor Center Road intersection are actually the result of congested conditions at the US29/VA234 intersection.

TABLE 5-3 Intersection Accident Rates

Intersection	Number of Accidents (1991-1994)	Accident Rate (Acc/MVE)
US29/VA234	63	2.38
US29/VA705 Pageland Lane	8	0.54
US29/VA622 Featherbed/Groveton	9	0.61
VA234/Visitor Center Road	23	1.67

In general, intersections with accident rates in the magnitude of three and five are typically considered very hazardous.

5.1.5 Light Conditions

The data was sorted to provide insight on the relationship between the number of accidents and the light condition at the time of the accident. A total of 146 accidents (58%) occurred during the day, while 83 accidents (33%) occurred at night. The remaining 21 accidents (9%) happened during the twilight hours at dawn and dusk.

5.1.6 Road Surface Conditions

The accident data was also sorted according to the road conditions at the time of each incident. According to the data, a total of 191 accidents (76%) occurred when the pavement was dry. A total of 50 accidents (20%) occurred on wet pavement, while one accident occurred on snow covered pavement and six accidents took place on icy pavement. The road condition was not stated in two accident reports.

5.1.7 Collision Type

The accidents were sorted according to collision type. This provides insight into the types of accidents that occur. The data is presented in TABLE 5-4. The data shows that there have been a large number of rear-end collisions and angle collisions on both major roads. There have also been

a large number of collisions with objects off the road. Accidents involving deer are also quite common in the Park.

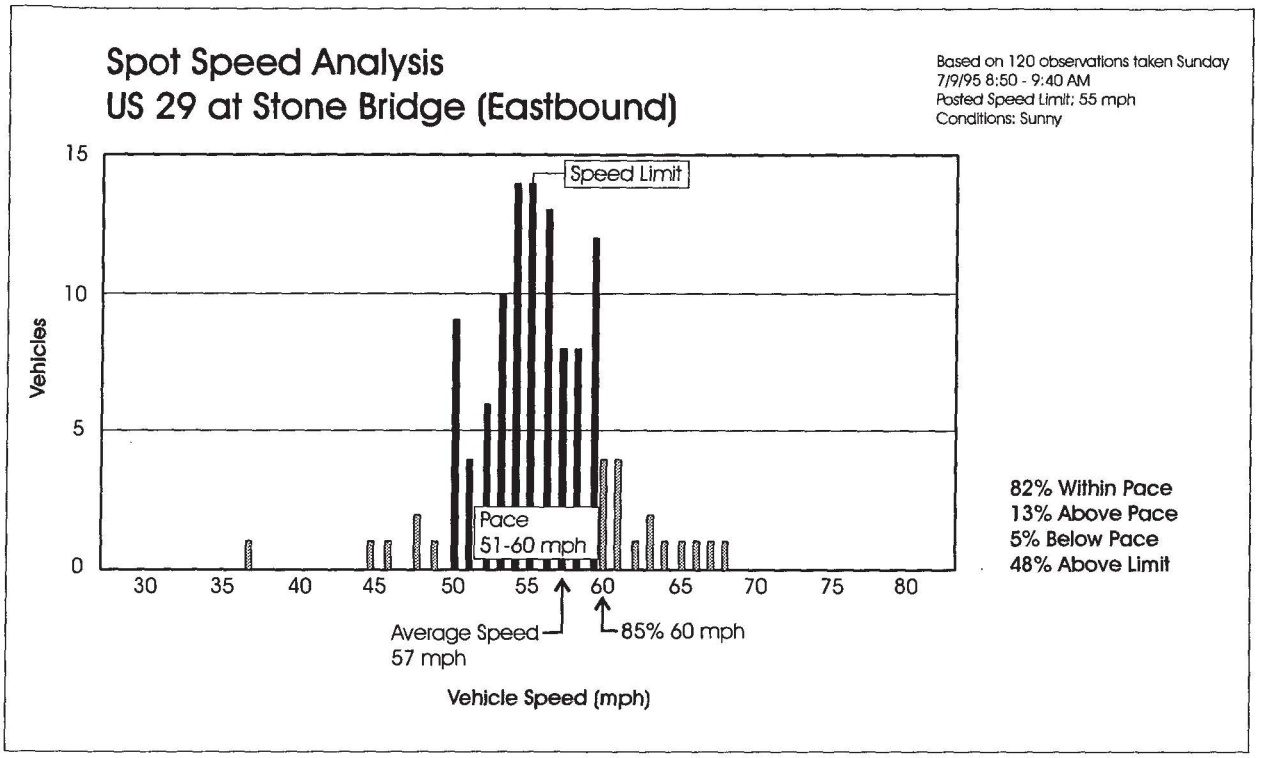
TABLE 5-4 Collision Type

Collision Type	US29	VA234	Park Roads
Rear End	42	40	0
Angle	21	22	1
Head On	1	5	1
Sideswipe Same Direction	10	3	0
Sideswipe Opposite Direction	4	2	0
Fixed Object in Road	1	1	2
Fixed Object off Road	19	34	0
Non-Collision	7	4	3
Deer	11	6	1
Other	0	4	5
Total	116	121	13

5.2 Spot Speed Studies

Spot speed tests were conducted at nine locations within the Park. Four tests were conducted on US29, four tests were held on VA234, and one test took place on Groveton Road. The spot speed tests were conducted in May and July of 1994 during site visits. All vehicles sampled in the spot speed tests were traveling at speeds that best represent a "free flow" condition. The normal testing parameters used in spot speed testing indicate that only free flowing vehicles be sampled in the speed analysis. This data provides the best indication of how fast vehicles would travel on the road without the influence of other traffic.

The analysis of spot speed data for one of the nine test locations (US29 at the Stone Bridge) is presented in FIGURE 5-4. The data shows that at this location, where the posted speed limit is 55 MPH the average vehicle speed recorded was 57 MPH east-bound and 52 MPH west-bound. In this case most of the sample is within the pace. Similar information on each of the spot speed test locations is presented in **Appendix C** of this document.



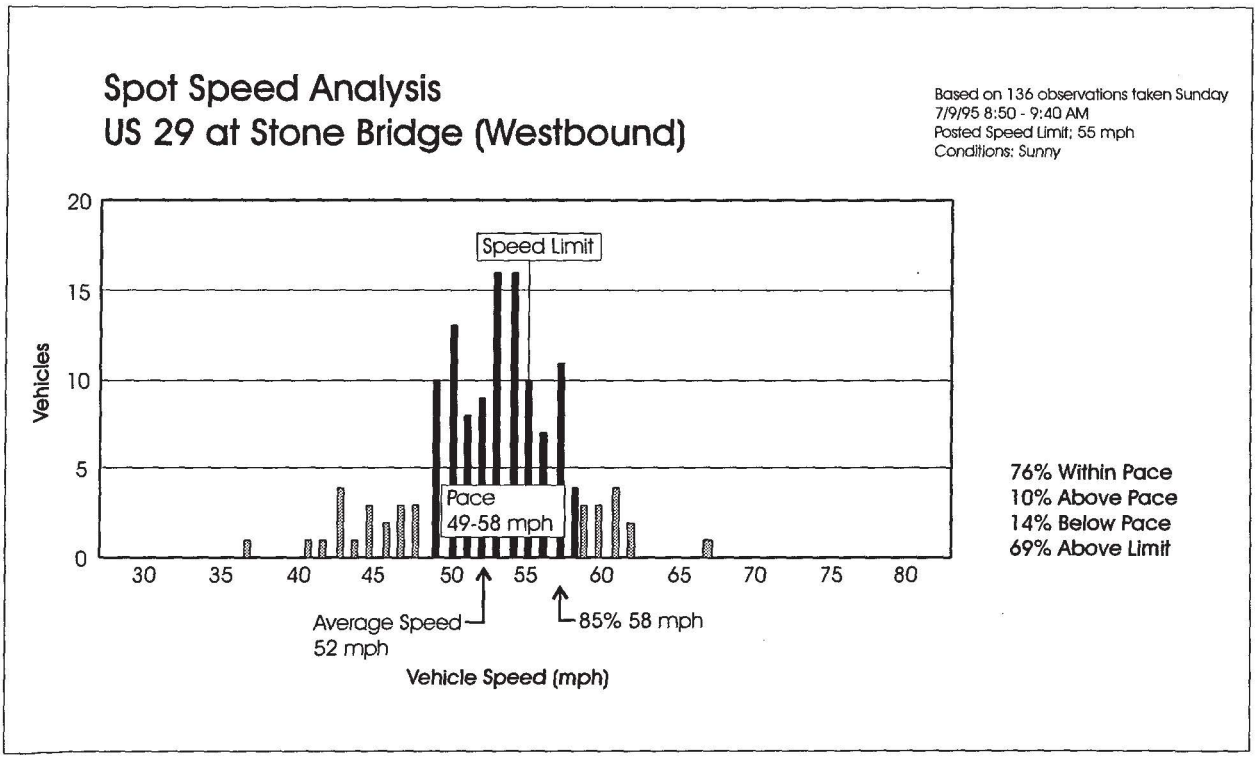


Figure 5-4:
Spot Speed Analysis
US 29 at Stone Bridge

Key to the analysis of speed data is an examination of the distribution of vehicle speeds on the route. The 85th percentile speed and the "pace" are two terms commonly used to describe specific characteristics of speed data. The 85th percentile speed, the speed which 85% of the vehicles are traveling at or below, is used to establish appropriate speed limits. The pace is a term that describes the ten mile per hour grouping of speeds at which the most observed vehicles are traveling. It is desirable to have at least 70% of the sample within the pace to minimize overtaking maneuvers.

Typically, about 15% of the sample will fall below the pace and 15% will be above the pace. As the percentage of vehicles within the pace increases, the number of passing conflicts decreases, thereby representing a safer speed distribution. Generally, the posted speed limit is within the pace and the 85th percentile speed is usually within few miles per hour of the upper limit of the pace.

A few general comments can be made about the spot speed data. In most cases over half of the vehicles sampled were exceeding the posted speed limit. In most cases at least 60% of the sample was within the pace. Typically the percentage of the sample traveling faster than the pace was greater than the percentage of the sample traveling below the pace.

5.3 Field Observations

Field observations were made during the months of May and July in 1995. During these site visits the traffic operations within the Park were observed and problem areas identified. Locations within the Park that were identified as having operational or safety problems are discussed in detail in Chapter 7. General observations relating to traffic safety were made during the site visits. Several safety concerns were noted during the field observations. The areas of particular concern are discussed below.

- There is a safety concern about the potential for rear-end accidents resulting from vehicles approaching the end of a long vehicle queue extending back from the US29/VA234 intersection. The length of the vehicle queue can vary from day to day and hour to hour. The vehicles at the end of the queue are stopped in the travel lane while the approaching traffic is traveling at highway speeds. In some cases, the end of the queue can occur near the crest of a hill or near a curve where the sight distance is limited.

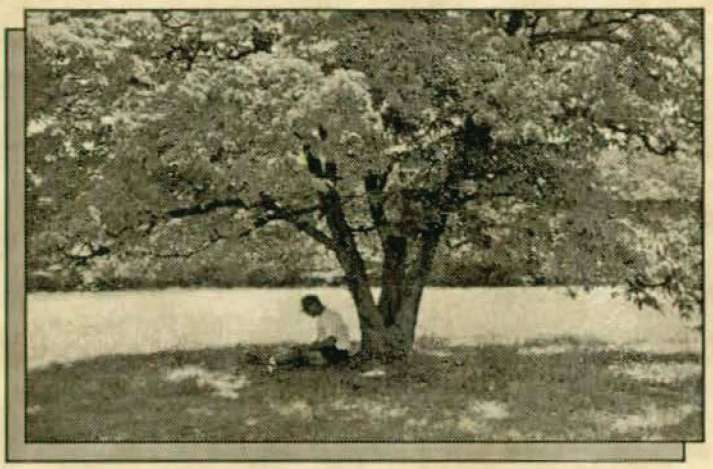
- Angle accidents at the US29/VA234 intersection are another safety concern. Several potential conflicts were observed and mentioned in the evaluation of the traffic signal operation presented in the previous chapter. The potential for conflicts exists for west-bound left turns during weekday evening peak periods. There is also the potential for conflicts to occur between right-turning vehicles on the south approach and left-turning vehicles on the north approach.

- The potential for rear-end accidents resulting from Park visitors attempting to enter or exit roadside interpretive areas was also identified as a safety concern. The vehicle speeds of the

through traffic on the major roads makes it difficult to safely access and egress these corridors.

- There are concerns about pedestrian safety at the US29/VA234 intersection and at the Dogan Ridge Picnic Area. Pedestrians were observed crossing the main road in these areas. There are no pedestrian facilities at the US29/VA234 intersection although there is a major hiking trail crossing US29 at this location. At Dogan Ridge pedestrians often cross VA234 in a location that is in the middle of a curve where the sight distance is poor.

Chapter 6: Traffic Projections



Chapter 6: Traffic Projections

6.1 MWCOG Traffic Projections

The Metropolitan Washington D.C. Council of Governments (MWCOG) is the agency responsible for performing regional land-use planning and traffic projections. Future year model runs were obtained for the area near the Park. The traffic projections presented in this section are for the years 2000, 2010, and 2020. The regional model provides data for the major roads in the area. The projections for the years 2000 and 2010 are based on the current road network. The projection for the year 2020 includes two new road additions. These two new roads include VA234 Bypass-South and the Tri-County Connector. The average daily traffic volume projections for years 2000, 2010, and 2020 are shown in FIGURE 6-1.

It should be noted that current average daily traffic volumes exceed year 2000 projections on US 29 east of the US29/VA234 intersection. Current volumes are assumed to be unusually high due to construction activities on I-66.

Figure 6-1: MWCOG Traffic Projections Years 2000 and 2010

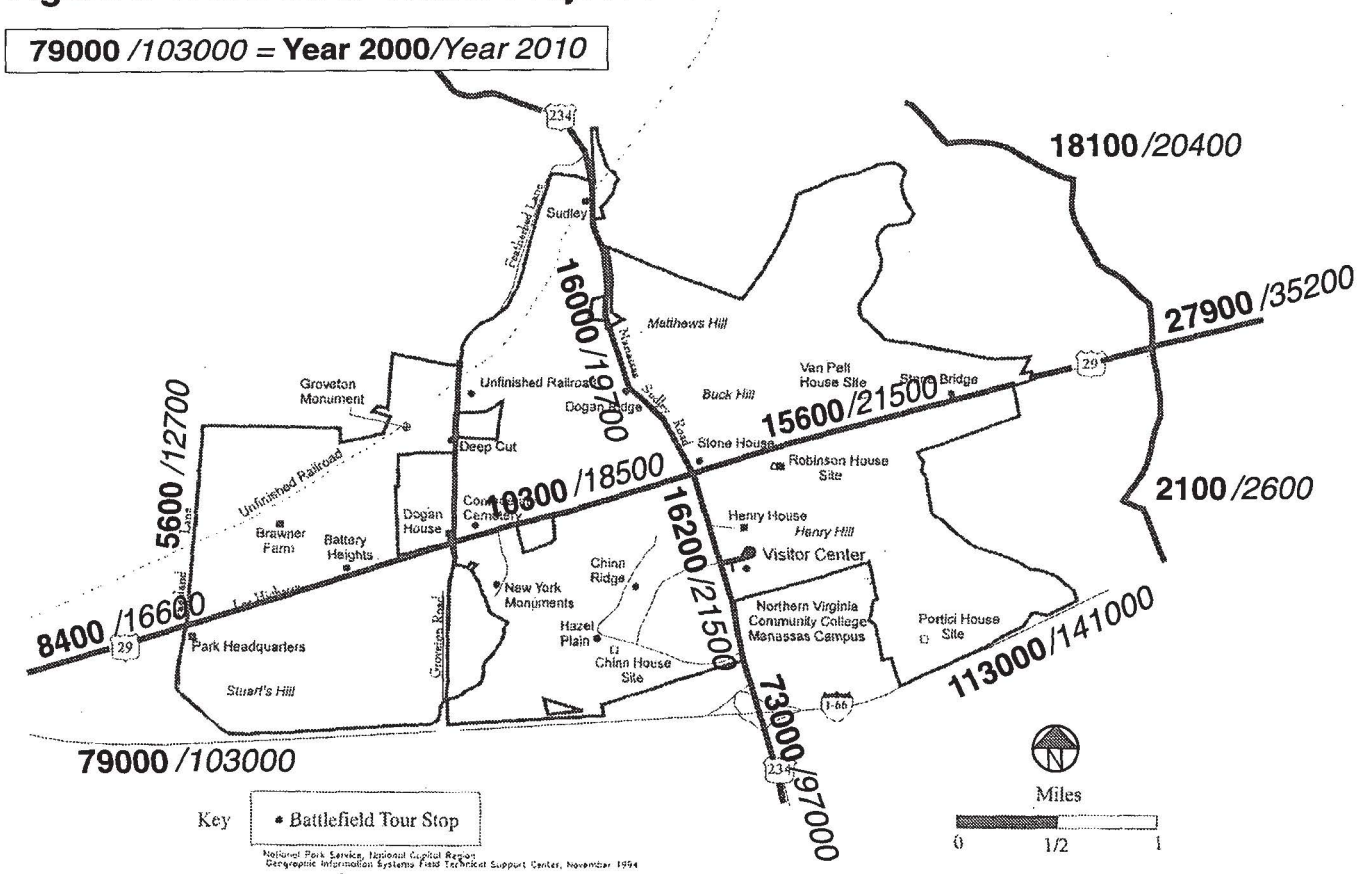
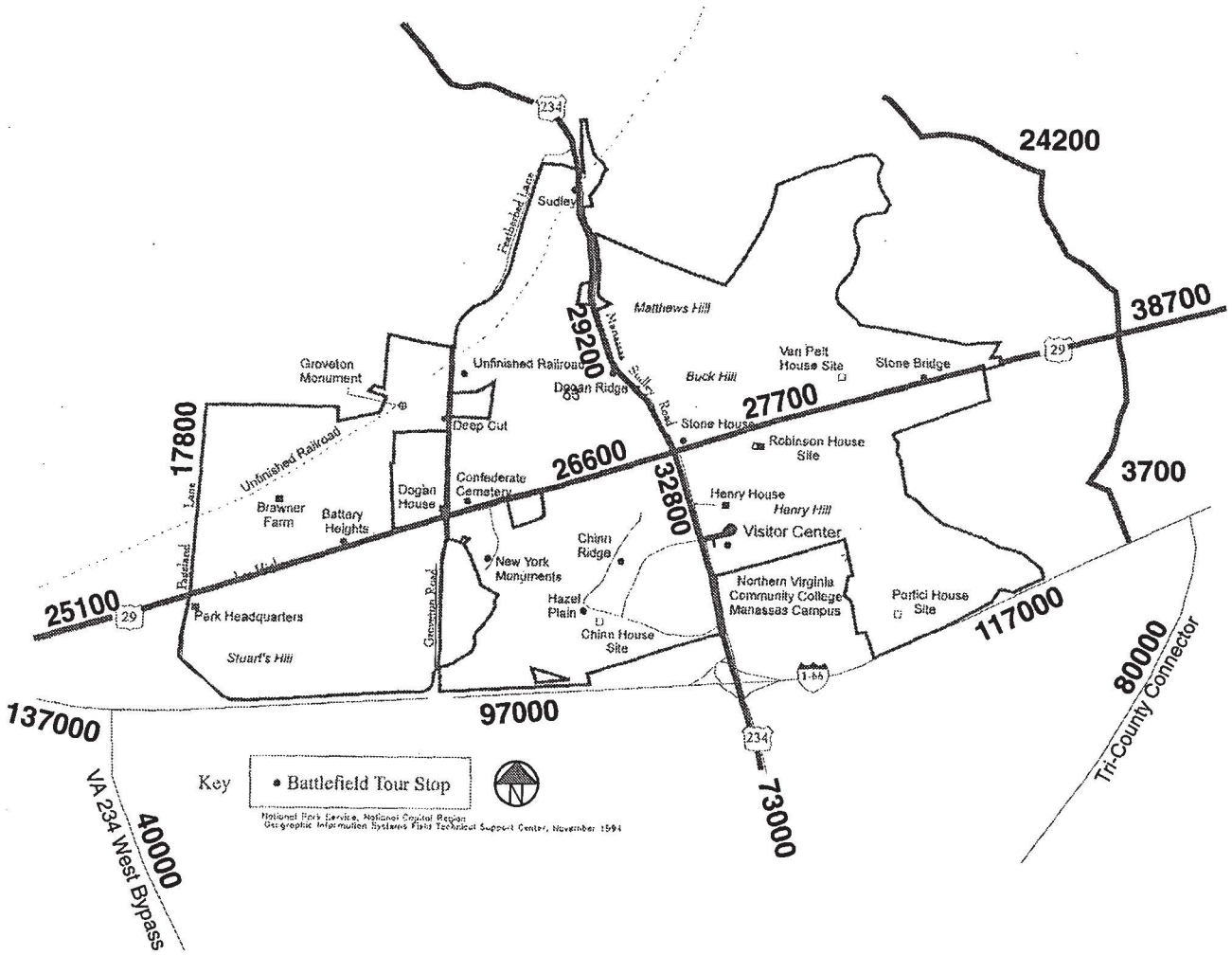


Figure 6-2: MWCOG 2020 Traffic Projections



6.2 Intersection Level of Service Analysis for Future Years

A future year Level of Service (LOS) analysis of the major intersections within the Park was conducted. The findings of this analysis indicate that most intersections within the Park will operate poorly in the future and will require signalization. The evaluation methods contained in the Transportation Research Board's ***Highway Capacity Manual-Special Report 209*** were used in this analysis. The assumptions used in this analysis are based on the MWCOG projected future year

traffic volumes applied to the existing intersection geometrics and traffic control. The analysis focused on the morning and evening peak travel hours. In cases where an unsignalized intersection exceeds the capacity, the LOS for the intersection with signalization is provided. The results are shown in TABLE 6-1.

TABLE 6-1 Projected Intersection LOS

Intersection	1995 LOS (AM/PM)	2000 LOS (AM/PM)	2010 LOS (AM/PM)	2020 LOS (AM/PM)
US29/VA234	F/F	F/F	F/F	F/F
US29/VA622	A/A	A/A	F/F (signal B/B)	F/F (signal C/C)
US29/VA705	A/A	A/B	F/F (signal C/C)	F/F (signal C/C)
VA234/Visitor Center Road	A/A	A/A	F/A (signal B/A)	F/F (signal B/B)

The analysis indicates that the only intersection that is currently operating over capacity is US29/VA234. The results also indicate that all four of the major intersections within the Park will operate in an over-capacity situation by the year 2010. The intersections of US29/VA705 (Pageland Lane), US29/622 (Groveton - Featherbed), and VA234/Visitor Center Road will all require signalization by the year 2010 in order to provide an adequate LOS. If signalized, these three intersections will operate at an acceptable Level of Service through the year 2020. It should be noted that signalization alone will not yield an acceptable LOS. In addition to the signalization, separate turn lanes would be necessary for one or more turning movements at each intersection to provide an acceptable LOS.

6.3 Corridor Level of Service for Future Years

A similar Level of Service (LOS) analysis was performed for the sections of US29 and VA234 within the Park. This analysis indicates how well the existing corridors will perform in future years. Four road segments were analyzed. The segments of US29 east and west of VA234 were evaluated separately, as were the segments north and south of US29 on VA234. The analysis was based on the MWCOG projected traffic volumes applied to the existing intersection geometrics and traffic control. The results of this analysis are shown in TABLE 6-2.

This analysis makes it clear that the traffic problems within the Park are much greater that just an intersection capacity problem. Both US29 and VA234 are currently operating at LOS-E or worse during weekday morning and evening peak periods. By the year 2010, all two-lane segments of these two roads will be over capacity (LOS-F).

TABLE 6-2 Corridor LOS

Road Segment	1995 LOS (AM/PM)	2000 LOS (AM/PM)	2010 LOS (AM/PM)	2020 LOS (AM/PM)
US29 East	F/F	F/F	F/F	F/F
US29 West	E/E	E/E	F/F	F/F
VA234 North	E/E	E/E	F/F	F/F
VA234 South	E/E	E/E	F/F	F/F

Chapter 7: Individual Site Evaluation And Recommendations

Chapter 7: Individual Site Evaluation and Recommendations

7.1 Site Evaluation Process

A systematic approach employing observations of driver characteristics, physical measurements of site conditions, and historical accident research was used in the evaluation of each site. The data collected through these procedures identified the circumstances or conditions that create a safety or operational problem at the site. The following narrative describes each activity performed during the data collection phase of this project.

7.1.1 Accident Analysis

All accidents recorded during the study period between 1991 and 1994 were obtained from the Virginia Department of Transportation (VDOT) and the National Park Service (NPS). These records were thoroughly examined. The location of each accident was plotted on a map of the Park to identify any possible accident cluster locations.

7.1.2 Initial Site Visit

The A/E visited each site to observe the traffic operation and to accurately locate all accidents that occurred within the site during the period of study. A review of the site's accident history is often beneficial in the determination of its problems and deficiencies. A subjective assessment of the driver's perception of the site and the presentation of traffic control devices was also performed.

7.1.3 Site Survey

Field technicians utilized survey equipment to measure the physical layout of the site. Data gathered during the survey included average road grades, road widths, road alignment, and superelevation in curves.

7.1.4 Site Photography

Photographs were taken to illustrate specific characteristics or to identify site deficiencies. These photographs were used extensively during the preparation of the report.

7.1.5 Identification of Site Features

This phase of the data collection involved extensive field measurements of site features including sign locations, pavement markings, location of medians, and other roadside objects. Coordination between field measurements and site photography resulted in the production of accurate graphics for each location. Measurements of sign sizes were also conducted to assess their conformance to ***Manual on Uniform Traffic Control Devices*** and NPS signing standards.

7.1.6 Traffic and Turning-Movement Counts

Machine traffic counters were used to determine the current traffic volumes on the roads within the Park. Manual turning movement counts were conducted to supplement traffic count data at sites that included a major intersection. The traffic count data was used to estimate the average daily traffic on the roads at each site.

7.1.7 Site Deficiencies and Proposed Solutions

The results of the accident analyses were used in conjunction with field observations to identify engineering deficiencies, operational problems, and traffic safety concerns at each site. Proposed solutions were developed to address identified problems and deficiencies at each site.

7.2 Individual Site Evaluations

A total of 17 individual sites were examined through the course of this project. The location of each site is shown in FIGURE 7-1. The following pages contain a discussion of the physical layouts, the operational characteristics, and any accident problems or concerns at each of the 17 sites examined. This information, combined with the results of various on-site traffic studies, helped to identify the cause of the problems at each site. Recommendations addressing the problems at each site were formulated in an effort to eliminate operational problems and reduce the frequency and/or severity of accidents.

Most of the proposed solutions involve limited construction and are designed to provide direct benefits to the motorists using the road system. The improvements are generally low-cost items and should be easily implemented by NPS personnel. The cost estimates provided for each improvement are approximate and intended for planning purposes only. Coordination with the Virginia Department of Transportation (VDOT) and the local counties will be required since most sites are located along routes that fall under state or county jurisdiction.

Site 1 - Battery Heights

Site Description: This site is located on the north side of US29 on the west side of the Park. FIGURE 7-1 shows the general location of the site. The parking area is located about 200 feet north of the road. The lot is accessed by a narrow road. The parking lot and the access road are both paved. The parking area is generally rectangular in shape and has an estimated capacity of six vehicles. The parking area is bordered by split rail fence to confine vehicular activity to the parking area. A system of trails can be accessed at this site. These trails lead off to the north of the site. A sketch of the site is shown in FIGURE 7-2 and photos of the site are presented in FIGURE 7-3.

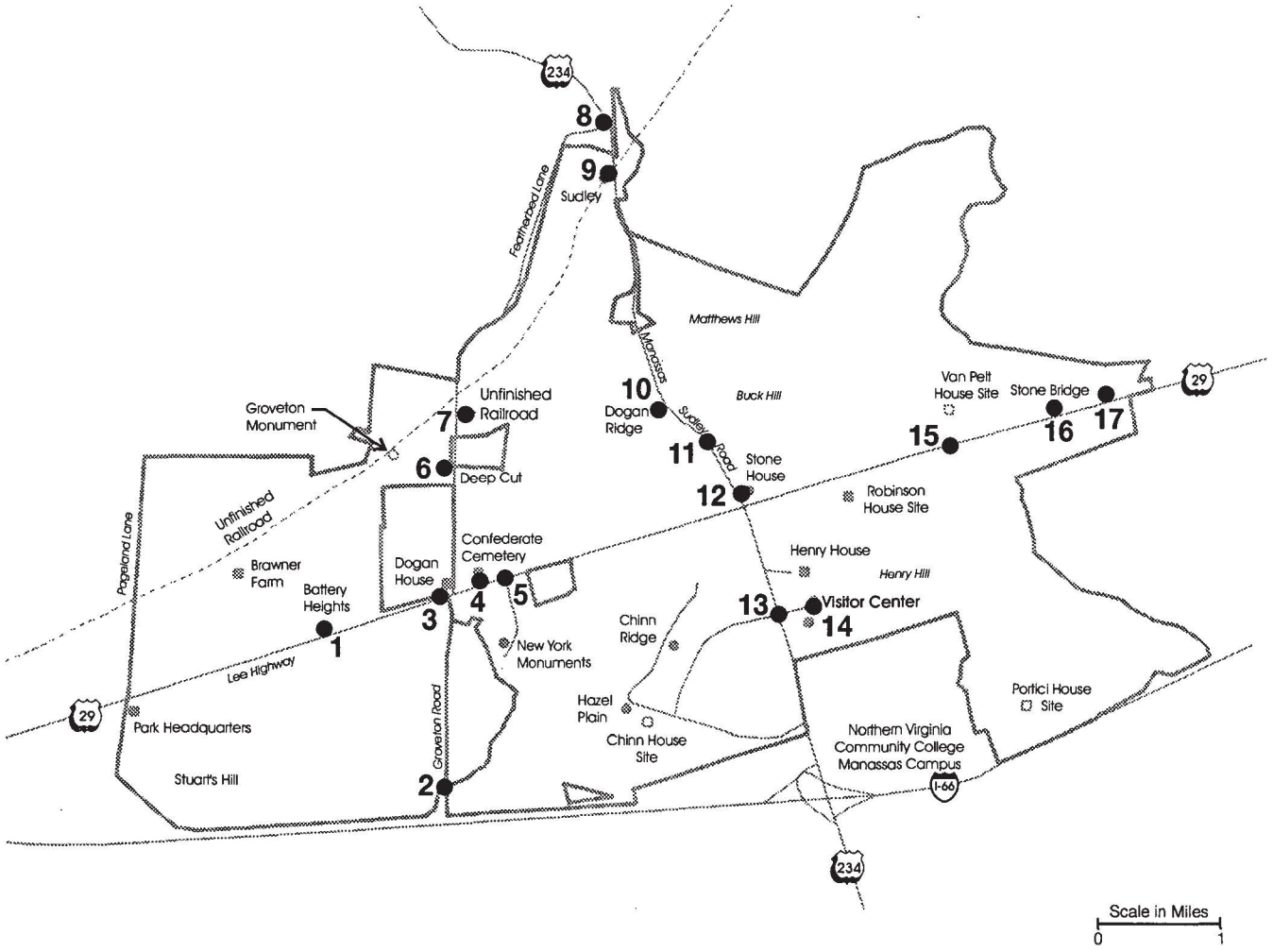
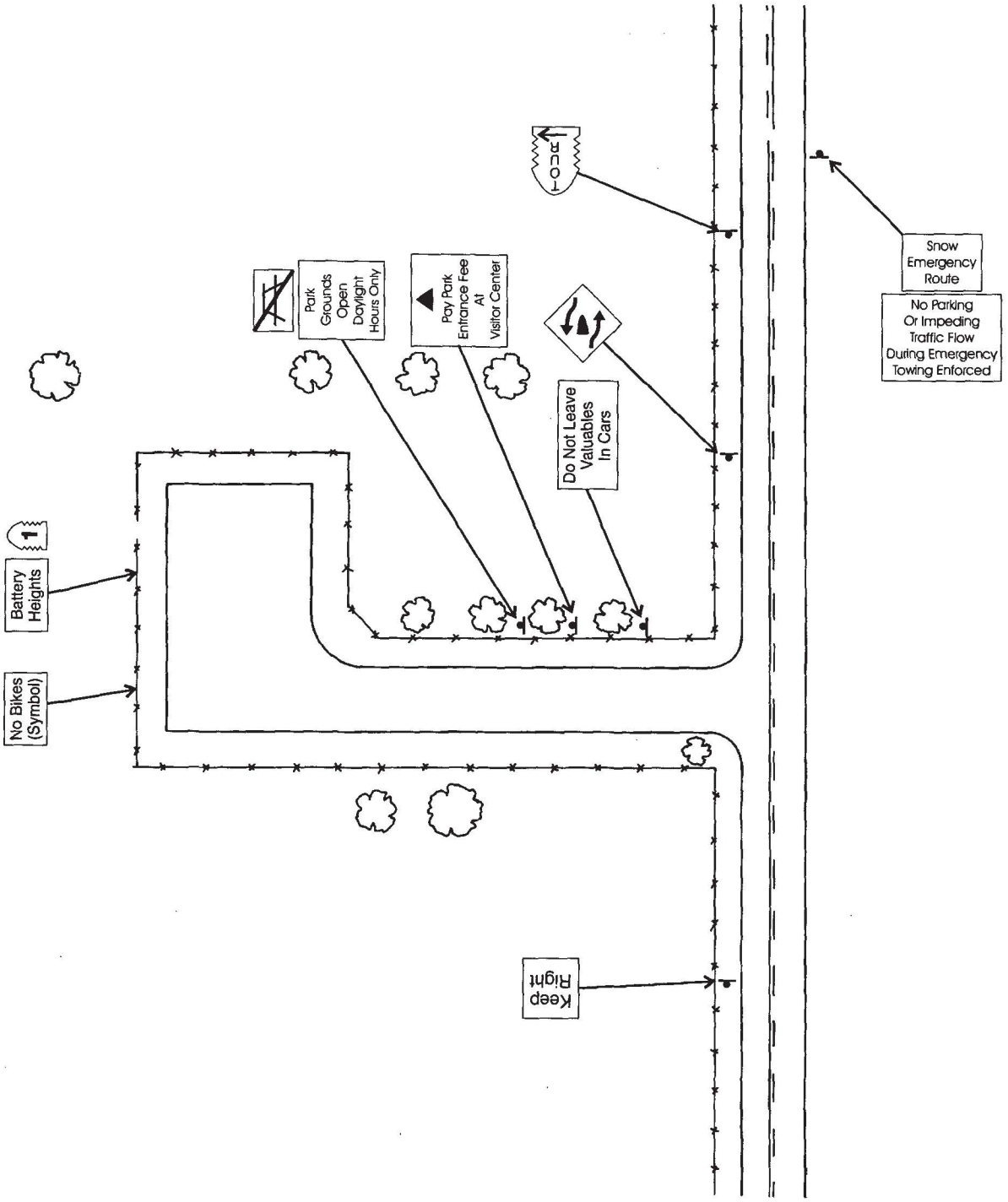


Figure 7-1: Individual Site Location Map

Manassas National Battlefield Park, Transportation Study



Not To Scale

Figure 7-2:
Site 1 - Battery Heights

Manassas National Battlefield Park, Transportation Study

The site signing along US 29 consists of this small blue tour sign. The access to this site is located adjacent to a slight crest in the road, just past the divided highway warning sign.

Site one is located on a straight section of US 29. This photo was taken at the entrance to the site looking east along US 29.

The access road to Battery Heights is paved and one lane wide. There is no traffic control signing at this site.

The parking area is generally rectangular in shape and can hold up to eight vehicles. This photo shows the parking congestion that results when the parking demand at this site exceeds the supply. This photo was taken when there were nine vehicles parked in this area. Several vehicles are blocked in by other vehicles.

Figure 7-3: Photo Page, Site 1

Problems:

- The access to this site is very difficult to identify from both approaches.
- There are no advance guidance signs on either approach and there is no site sign at the access point.
- The access road that leads into the site is only wide enough for one vehicle to pass at a time.
- There is no traffic control on the access road or parking delineation in the parking area.

Recommendations:

❑ Install advance site guidance signs 300 feet from the site on both approaches on US29.

Estimated Cost: $ 700

❑ Install a bi-directional guidance sign for the site and locate it on the south side of US29 directly across from the access road.

Estimated Cost: $ 700

❑ Install a stop sign and a painted stop bar on the north approach to the intersection of US29 and the site access road.

Estimated Cost: $ 500

❑ Clear all the vegetation on the east and west sides of the access road at the intersection to improve sight distance. To further improve visibility, the earth berms on both sides of the access road could be flattened. However, this may not be advisable because it would require altering the historic battlefield landscape.

Estimated Cost: $3,000

Long Term Recommendations:

❑ This interpretive site will be moved to the Brawner House.

Estimated Cost: Unknown

Total Estimated Cost: $4,900

Site 2 - Groveton Road & Pageland Lane

Site Description: This site consists of the "T" intersection of Groveton Road and Pageland Lane. This intersection is located in the southwest quadrant of the Park. FIGURE 7-1 shows the location of the site within the Park. All three approaches to the intersection are paved. The alignment of Groveton Road through the site is relatively straight. Groveton Road crosses a bridge over I-66 immediately south of the site. FIGURE 7-4 shows the site layout and Figure 7-5 contains photos of the site.

Problem:

- The lack of adequate sight distance is the major problem at this intersection.
- The trees and other vegetation on the west side of Groveton Road block the sight distance on both sides of the intersection.
- There is no advance warning of the intersection on any of the approaches.
- The vehicles on Groveton Road are exceeding the 35 MPH speed limit.
- The stop sign is undersized.

Recommendations:

❑ Remove the vegetation that blocks the sight distance on the north and south sides of the intersection.

Estimated Cost: $1,000

❑ Remove and replace the undersized stop sign with a standard 30" x 30" stop sign.

Estimated Cost: $ 350

❑ Install a painted stop bar on the west approach.

Estimated Cost: $ 200

❑ Install a stop ahead warning sign 500 feet from the intersection on the west approach.

Estimated Cost: $ 250

❑ Install "T" intersection warning signs 500 feet from the intersection on the north and south approaches.

Estimated Cost: $ 500

Total Estimated Cost: $2,300

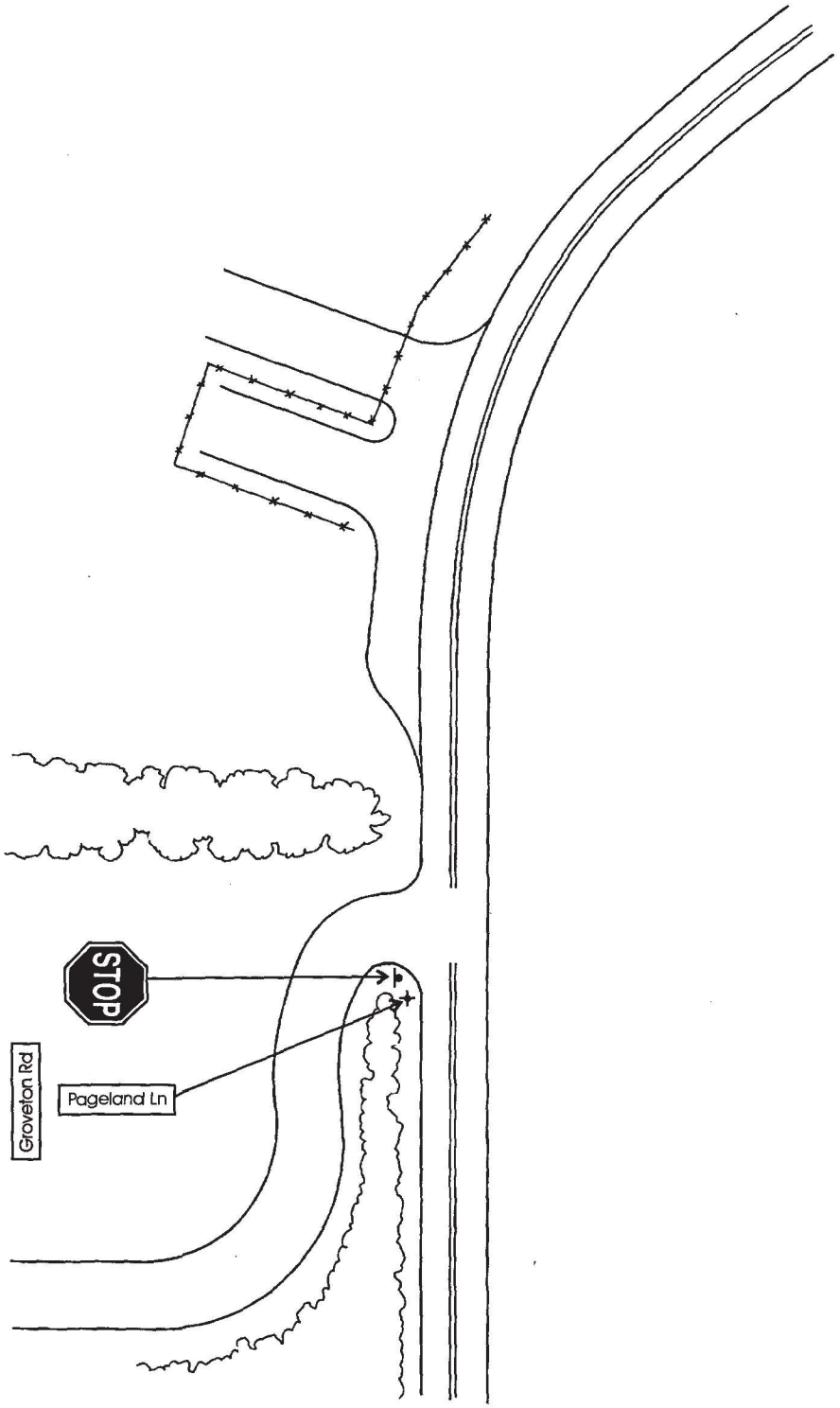


Figure 7-4:
Site 2 - Groveton Road & Pageland Lane

Not To Scale

Manassas National Battlefield Park, Transportation Study

The vegetation adjacent to the intersection blocks the driver's view of the south approach.

The intersection can be seen in this photo on the left side of the road at the end of the guardrail section. There is no advance intersection signing on any of the approaches.

This photo shows the north approach to the intersection. Notice how the roadside vegetation blocks the driver's view of the side road approach.

The west approach to the intersection consists of a set of reverse curves. The driver's view of the intersection is blocked by vegetation as shown in this photo.

Figure 7-5: Photo Page, Site 2

Site 3 - US29, Groveton Road & Featherbed Lane

Site description: This site consists of the four-way intersection of Groveton Road, Featherbed Lane, and US29. The general location of the site within the Park is shown on FIGURE 7-1. All of the roads at the site are paved. Traffic volumes on US29 are estimated to be about 10,000 VPD, while Featherbed Lane carries an estimated 500 VPD, and Groveton carries 1,500 VPD. The traffic on the Groveton approach from the south and the Featherbed approach from the north are controlled by stop signs. Large (48" x 48") "Watch For Turning Vehicles" warning signs are present on the east and west approaches to the site. A large number of trucks use Groveton Road to access the industrial area and gravel quarry on the south side of I-66. The roads intersect at right angles but are offset by about 50 feet. The Lucinda Dogan House is located on the northwest corner of the intersection. Visitors wishing to see the Dogan House must park at the Groveton Cemetery lot to the east on US29. There is a trail connecting the parking area with the Dogan House area. A sketch of the site is presented in FIGURE 7-6 and site photos are shown in FIGURE 7-7.

Problems:

- The biggest problem at this site involves sight distance.
- The back slope of the road cut on the northwest and southwest corners of the intersection totally block the view of the intersection when approaching from the west.
- These back slopes also block the driver's view of the west approach when waiting at either stop sign.
- The view of the stop sign and tour sign on the north approach are blocked by tree branches.
- The stop signs are undersized.
- There is no advance warning of the intersection on either the north or south approaches.

Recommendations:

❑ Remove the existing stop signs and replace them with standard 30" x 30" stop signs.

Estimated Cost: $ 700

❑ Install painted stop bars on the north and south approaches.

Estimated Cost: $ 400

❑ Install stop ahead warning signs on both the north and south approaches to the intersection. The signs should be installed about 500 feet from the intersection.

Estimated Cost: $ 500

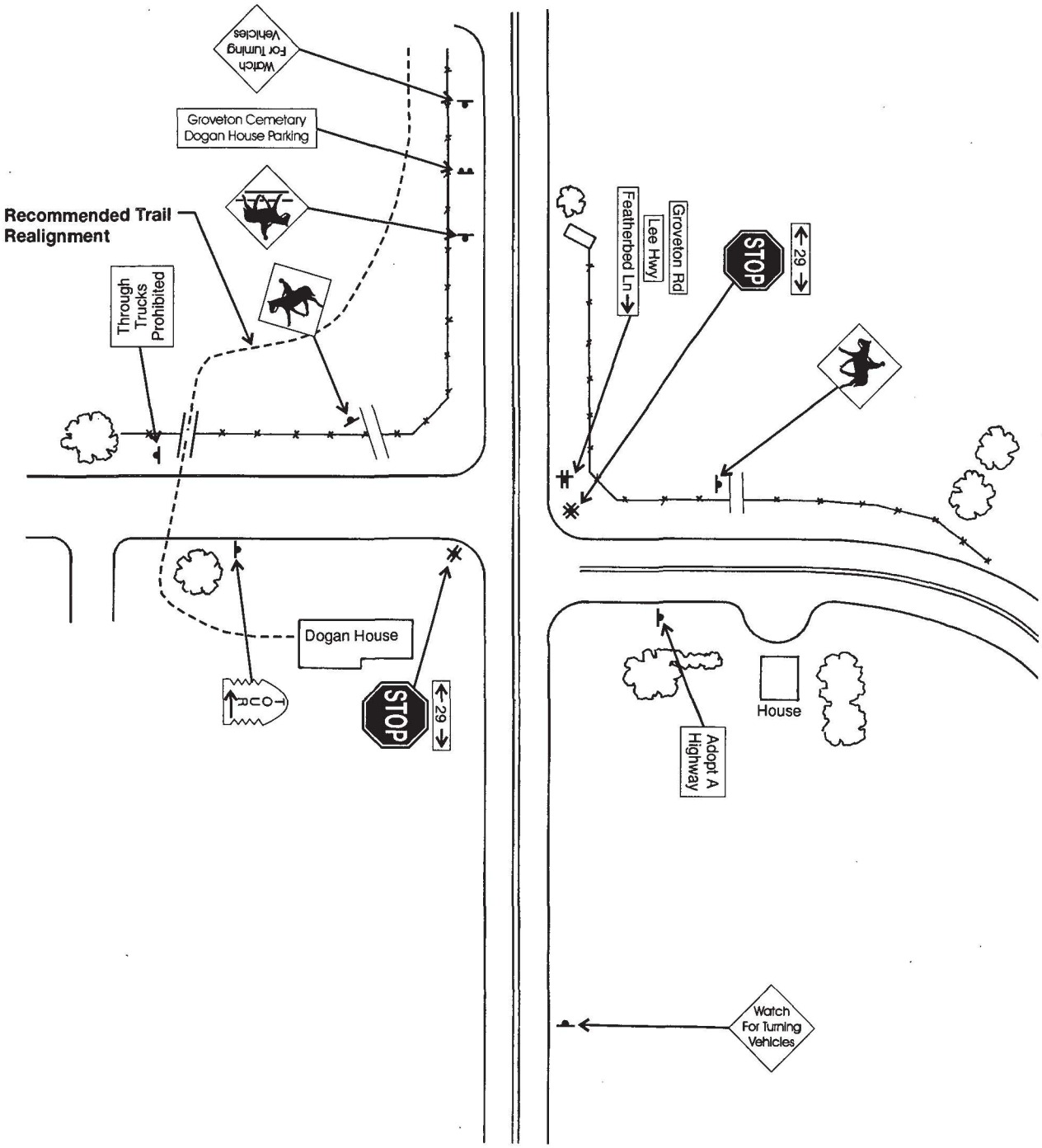


Figure 7-6:
Site 3 - US 29, Groveton Road & Featherbed Lane

Not To Scale

Manassas National Battlefield Park, Transportation Study

This is a view of the intersection of US 29/Groveton/ Featherbed as seen when approaching from the west on US 29. Notice how the tall earth embankments on the north and south sides of the road block the driver's view of the side road approaches.

The south approach to this intersection is controlled by a stop sign. The driver has a good view of the intersection when approaching from the south.

The driver's view of the stop sign on the north approach is blocked by the tree branches on the west side of the road.

A horse trail leads up to the side of the road on the northeast corner of this intersection. The trail connects to the Groveton Cemetery that is located to the east of this site.

Figure 7-7: Photo Page, Site 3

❑ Remove the tree branches that block the view of the stop sign on the north approach.
Estimated Cost: $ 500

❑ Relocate the trail crossing to a new location 200 feet north of the intersection.
Estimated Cost: Unknown

❑ Install a pedestrian warning sign on the north approach. Locate the sign about 300 feet north of the new trail crossing location.
Estimated Cost: $ 250

❑ Routinely cut the grass that grows on the backslopes west of the intersection in an effort to improve the sight distance at the intersection.
Estimated Cost: Unknown

❑ Trim the tree branches on the tree located on the south side of US29 and 300 feet west of the intersection. These branches block the driver's view of the road to the west of the intersection when stopped on the south approach.
Estimated Cost: $ 500

❑ A less-desirable option would be to flatten the backslope on the northwest and southwest corners of the intersection, altering the historic battlefield landscape.
Estimated Cost: $10,000

Long Term Improvement:

❑ A less-desirable option would be to realign the south approach to the east so that it intersects US29 across from the north approach. The current alignment is that of the historic roads through the community of Groveton and any modifications would require altering the historic battlefield landscape.
Estimated Cost: $75,000

Total Estimated Cost: $ 87,850

SITE 4 - Groveton Cemetery

Site Description: This site is located on the north side of US29 0.3 miles east of the Groveton Road intersection. FIGURE 7-1 shows the general location of the site within the Park. The parking area is rectangular in shape, has a paved surface. There is a single access point to the lot directly off of US29. The access point is located at the crest of a hill on US29. This

site is traditionally used by horse riders. Vehicles with horse trailers are common in this lot. A site sketch is presented in FIGURE 7-8 and site photos are shown in FIGURE 7-9.

Problems:

- There is no advance signing for this site.
- The site access is very hard to see when approaching on US29 from either direction.
- The parking lot has no established parking or circulation pattern identified.
- Pedestrians were observed on several occasions crossing US29 attempting to access the New York Monument on the south side of the road.

Recommendations:

❑ Install brown and white advance site guidance signs 300 feet in advance of the site access on both approaches. Locate the signs on the right side of the road.

Estimated Cost: $ 700

❑ Remove the two existing site guidance signs and replace them with a single bi-directional sign located on the south side of the road across from the parking lot access.

Estimated Cost: $ 900

❑ Designate a horse trailer parking area within the parking lot through the use of pavement markings and signs. The trailer parking spaces should be along the north side of the lot. Passenger vehicle spaces should be delineated along the south side of the lot.

Estimated Cost: $ 100

❑ The egress from the parking lot should be controlled by a stop sign.

Estimated Cost: $ 250

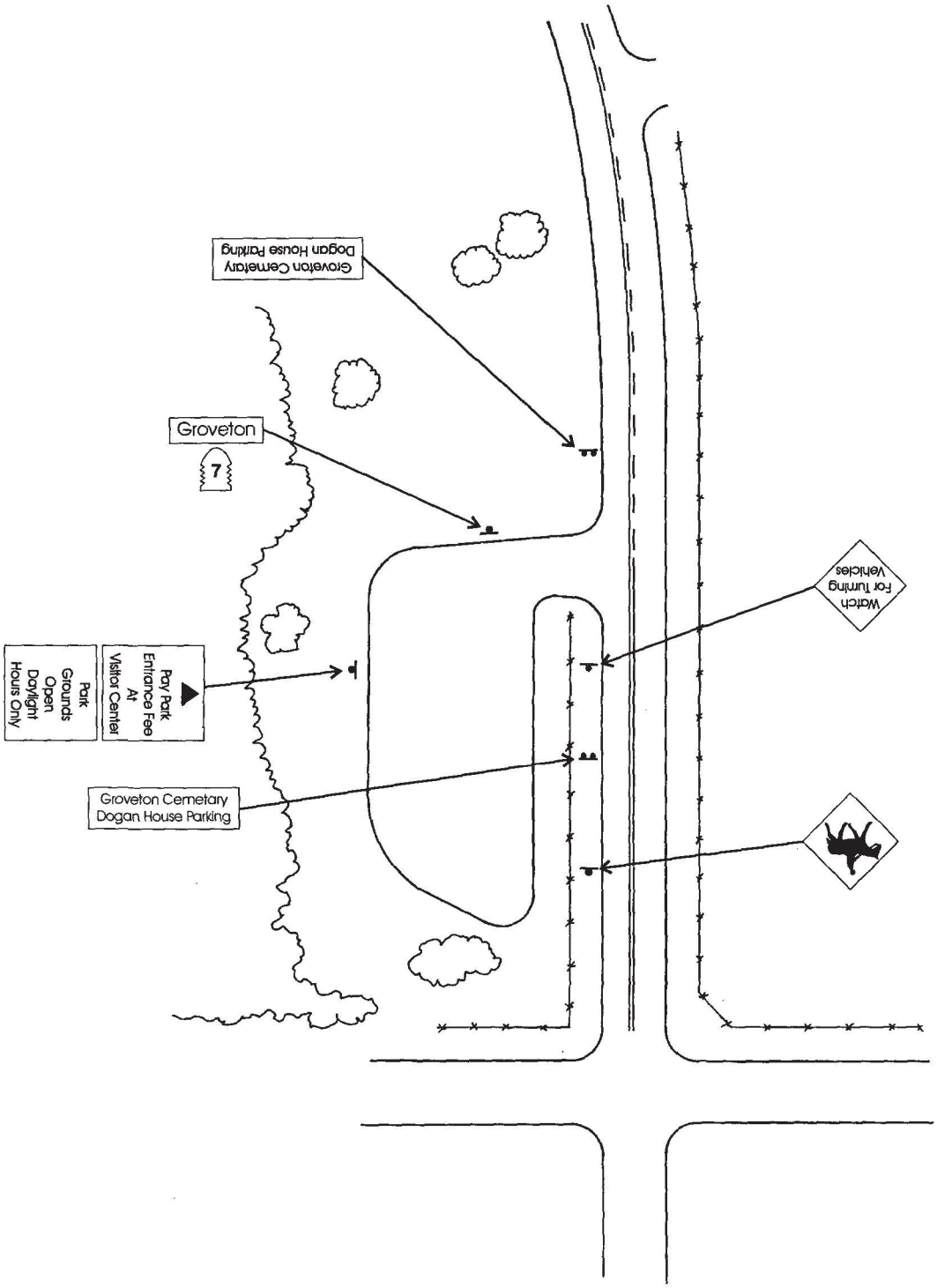
❑ Plant vegetation along the fence on the south side of US29 across from the parking area. The vegetation should discourage visitors from crossing the road in this area while not blocking the interpretive view to the monument on the south side of the road.

Estimated Cost: $ 250

❑ Install a trail marker indicating the trail that leads to the Dogan House from the parking area.

Estimated Cost: $ 250

Total Estimated Cost: $2,450



Not To Scale

Figure 7-8:
Site 4 - Groveton Cemetery

Manassas National Battlefield Park, Transportation Study

The entrance to the parking area at the Groveton Cemetery is located on the north side of US 29 at a crest in the road. This photo shows the guidance signing for this site when approaching from the east on US 29.

The guidance signing for this site is located on the left side of the road on the west approach. The crest in the road adjacent to the parking entrance obstructs the driver's view of oncoming traffic until the driver is at the entrance on the crest of the hill.

The verticle curve in the highway adjacent to the entrance to this site limits sight distance for vehicles attempting to turn left into the parking lot from the west and for all vehicles exiting the parking area.

The parking area is relatively large, paved, and rectangular in shape. Visitors with horse trailers often use this site to load and unload because of the large amount of space that is usually available at this parking area.

Figure 7-9: Photo Page, Site 4

Site 5 - New York Monuments

Site Description: This site is located on the south side of US29 between Groveton Road and VA234. FIGURE 7-1 shows the general location of the site within the Park. The single entrance to the site is located about 0.25 miles east of the Groveton Cemetery site. The intersection is located on a hill to the west and in a straight section of US29. The posted speed limit through the site is 55 MPH. The road to the east of the intersection is relatively flat. This site consists of the access road and two paved parking areas. One parking area (lower New York) is located about 200 feet south of US29 and has an estimated capacity of 10 vehicles. The other parking area (upper New York) is located about 0.2 miles south of the highway at the end of the access road. The Upper New York lot is located on a turn-around and has a capacity of about 12 vehicles. There is a 30 minute limit on parking at the Upper New York lot. There is a trail crossing US29 at this site that leads to the Groveton Cemetery. The general site layout is shown in FIGURE 7-10 and photographs of the site are presented in FIGURE 7-11.

Problems:

- There is no advance guidance signing for this site on US29.
- Vehicle speeds on US29 make it difficult to turn into and out of this site.
- The single lane turn-around at the end of the access road does not have any signing indicating the desired traffic circulation pattern.
- The desired parking pattern is not clear at either parking lot.
- It is considered undesirable to encourage a pedestrian crossing of US29 at this location considering the limited sight distance to the west of the site and the high vehicle speeds.
- Passing is allowed for eastbound traffic through this site.

Recommendations:

❑ Install advance guidance signs 300 feet from the site access on both approaches on US29.

Estimated Cost: $ 700

❑ Prohibit passing on both approaches to the intersection on US29.

Estimated Cost: $ 500

❑ Eliminate or relocate the trail crossing of US29. Stop mowing the trail and plant vegetation that discourages visitors from crossing the road in this area while not blocking the interpretive view of the monument in Groveton Cemetery.

Estimated Cost: Unknown

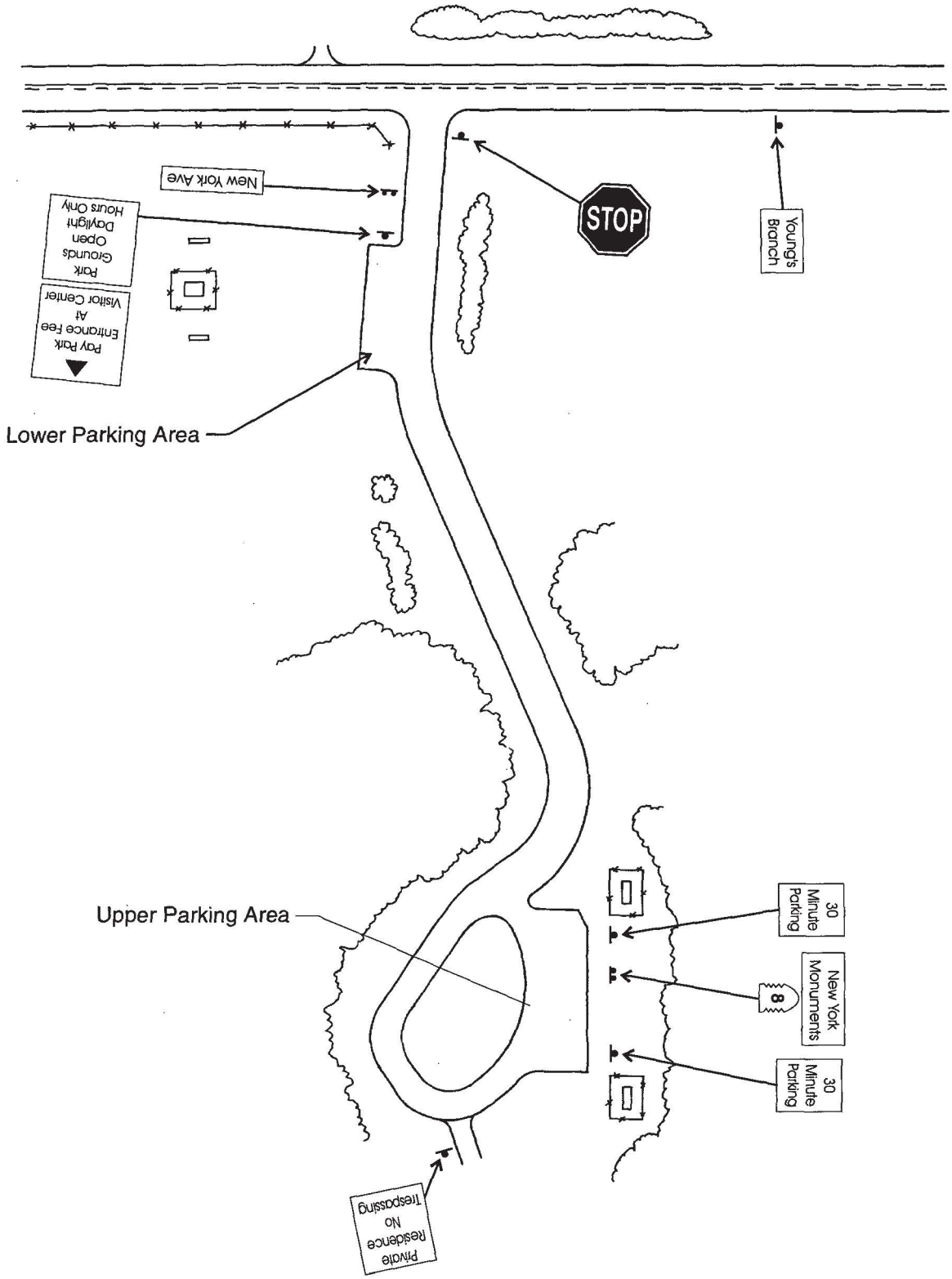


Figure 7-10:
Site 5 - New York Monuments

Not To Scale

Manassas National Battlefield Park, Transportation Study

The junction of the New York Monuments access road and US 29 forms a standard "T" intersection. The side road is controlled by a stop sign.

This photo shows the driver's view of the west approach when attempting to enter US 29. Although it is difficult to see in this photo, the centerline on US 29 allows for passing by east-bound vehicles through this site.

The lower parking area at the New York Monuments is a paved pullout that will hold up to 10 vehicles. There are no pavement markings identifying the prefered parking pattern and vehicle spacing.

The upper parking area has been designed for angle parking and a counter-clockwise traffic circulation pattern around the loop. Notice that the loop road is only wide enough for one vehicle and that the preferred one-way circulation pattern has not been identified with signs or pavement markings.

Figure 7-11: Photo Page, Site 5

Manassas National Battlefield Park, Transportation Study

❑ Install a "Keep Right" sign on the end of the median island at the turn-around at the end of the access road.

Estimated Cost: $ 250

❑ Install paint striping to delineate 12 angle parking spaces at the upper parking lot and 10 perpendicular spaces at the lower parking lot.

Estimated Cost: $ 500

❑ Install a painted stop bar at the stop sign at the intersection of US29.

Estimated Cost: $ 250

Total Estimated Cost: $2,200

Site 6 - Deep Cut

Site Description: Deep Cut is located about 0.5 miles north of US29 on Featherbed Lane. FIGURE 7-1 shows the general location of the site within the Park. The site consists of a graveled roadside parking area that is about 14 feet wide and 150 feet long. The parking area has an estimated capacity of five vehicles. The site is located on the west side of a relatively straight section of Featherbed lane, which is paved through the site. The main attraction at this site is a monument in the field to the west of the site. There is a pedestrian and horse trail crossing at the south end of the parking area. A sketch of the site showing the physical features is shown in FIGURE 7-12. Pictures of the site are presented in FIGURE 7-13.

Problems:

- There is no advance signing at this site.
- The only site signing faces north and can not be seen from the south.
- There is no warning for the trail crossing.
- The linear design of the parking area creates some traffic problems for vehicles facing opposite directions.
- The crest in the grade of the road is located at the south end of the parking area and significantly limits the sight distance to and from the south.

Recommendations:

❑ Install guidance signs 300 feet in advance of the parking area on both approaches.

Estimated Cost: $ 700

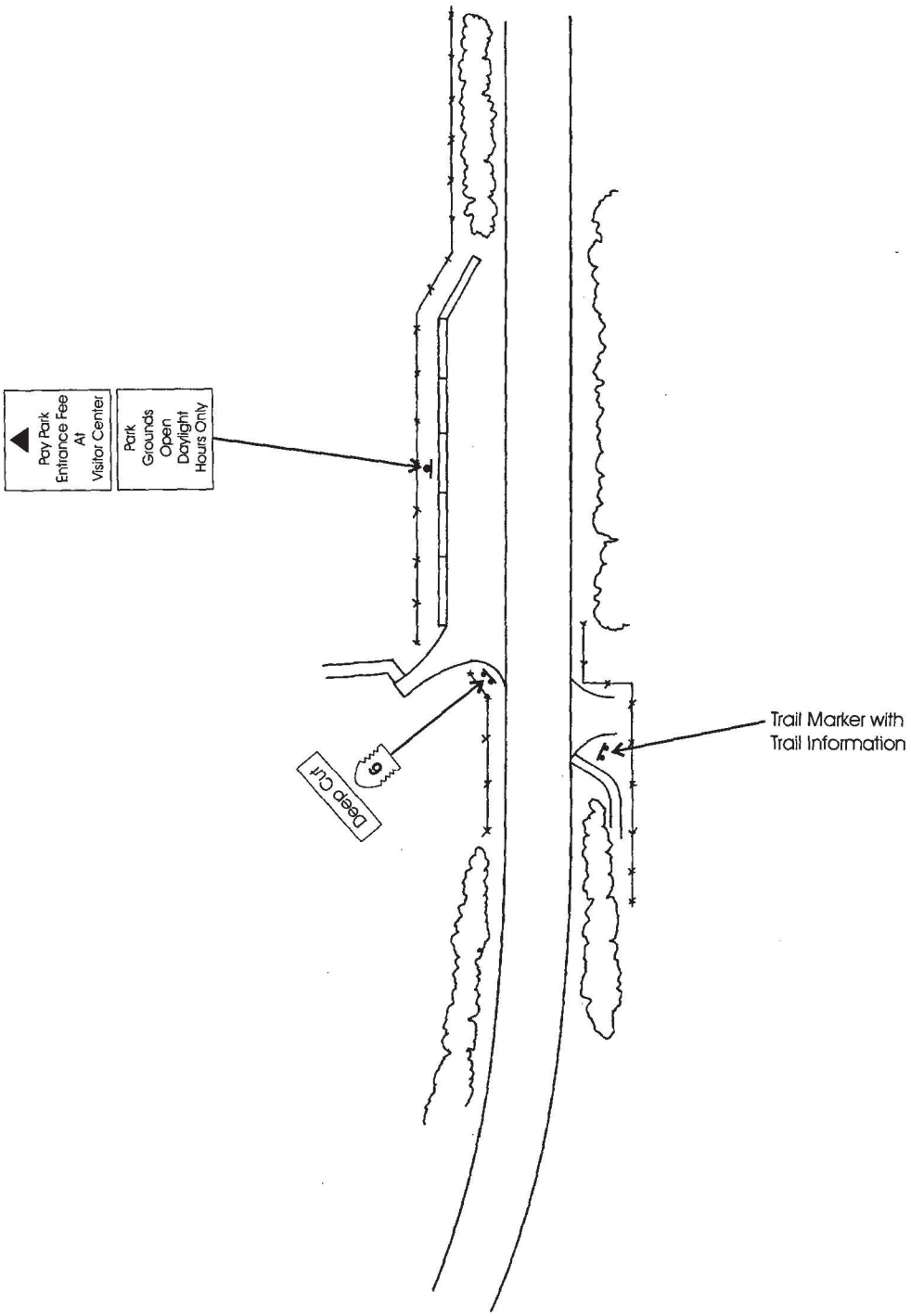


Figure 7-12:
Site 6 - Deep Cut

Not To Scale

The parking area at Deep Cut consists of a gravel pullout on the west side of the road that can hold up to six vehicles at a time. Although all of the vehicles in this photo are facing south, vehicles often pull in from opposing directions, and either angle or parallel park in this area.

The site is identified with a brown and white guidance sign and a blue and white tour marker. These signs are not visible to vehicles approaching from the south. Vehicles approaching from the north often can not see these signs because their view is blocked by parked vehicles.

The view of the parking area when approaching from the north is partially blocked by trees along the side of the road. There is no advance signing for the site.

The driver's view of the site on the south approach is totally blocked by the crest in the road. In this photo only the top of a vehicle parked in the pullout can be seen on the left side of the road.

Figure 7-13: Photo Page, Site 6

❑ Install a bi-directional site sign on the east side of the road across from the parking area. Locate the sign so it can be seen from both approaches.

Estimated Cost: $ 700

❑ Install advance pedestrian crossing warning signs 200 feet in advance of the site on both approaches.

Estimated Cost: $ 500

Long Term Improvement

❑ Relocate the parking area 300 feet to the north of the current site. This will move the parking area away from the crest of the road. The new gravel parking area should be designed so that it is off of the road with a single access point that is controlled by a stop sign. The new lot should be sized to accommodate at least 10 vehicles. The existing parking area should be removed and revegetated. It may be necessary to install a split rail fence through the old parking area to discourage its use by visitors. A structure near this proposed parking area was recently removed. The previously disturbed site could also be used for the new parking lot.

Estimated Cost: $50,000

Total Estimated Cost: $51,900

SITE 7 - Unfinished Railroad

Site Description: The Unfinished Railroad site is a popular stop on the interpretive tour and receives a steady flow of visitors. The site is located in a wooded area 0.7 miles north of US29 on Featherbed Lane. The gravel parking area is on the east side of Featherbed Lane which is also gravel through the site. The parking area has an estimated capacity of 12 vehicles. Logs are used to delineate the edge of the graveled parking area. There is a private road access directly across the Featherbed Lane from the parking area. Trails lead off in several direction from the site. A horse trail crossing Featherbed Lane also occurs at this site. The main trail along the unfinished railroad begins across the road from the parking area. A sketch of the site is shown in FIGURE 7-14. Site photos are presented in FIGURE 7-15.

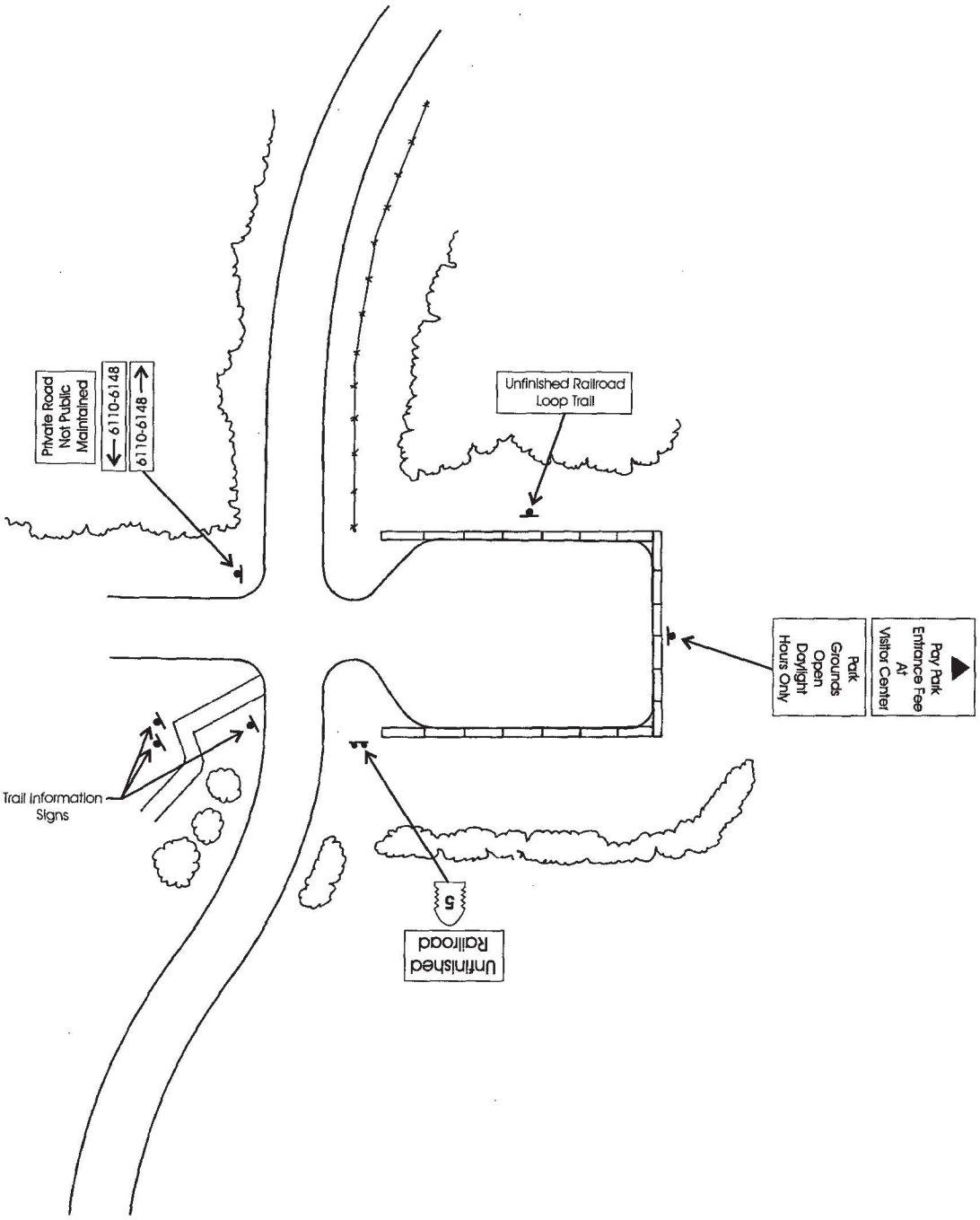


Figure 7-14:
Site 7 - Unfinished Railroad

Not To Scale

Manassas National Battlefield Park, Transportation Study

The parking area at the Unfinished Railroad is gravel, rectangular in shape, and can hold about 12 vehicles. Parking patterns within the lot vary from hour to hour.

This site has several hiking trails that lead to other areas of the Park. The trail shown on the left in this photo leads to the prime interpretive area at this site. The trail on the right is used by horse riders. These trails cross Featherbed Lane at this location.

The driver has a relatively good view of the north approach when exiting the parking area. This photo shows the north approach and the private road that intersects Featherbed Lane across from the parking area.

The driver's view of the site when approaching from the south is blocked by vegetation. The driver can not see the parking area on the right or the trail head on the left side of the road. There are no advance warning signs on the approaches to this site.

Figure 7-15: Photo Page, Site 7

Problems:

- There is no advance signing for the site. The only site sign is facing north for southbound vehicles.
- There is no warning of the pedestrian and horse crossings at this site.
- The parking area operates near or at capacity during weekends.
- Field observations indicate that the vehicles often park in various patterns and often at random within the parking area.
- Vehicles were seen backing out onto the road because the lot is too small to turn around in when there are several other cars parked in the lot.

Recommendations:

❑ Install brown and white guidance signs 300 feet from the site on both approaches.

Estimated Cost: $ 700

❑ Install a bi-directional brown and white site sign that is visible from both approaches. Field observations indicate that many visitors approach the site from the south, which is not the prescribed direction of the driving tour.

Estimated Cost: $ 700

❑ Install advance pedestrian warning signs 200 feet from the site on both approaches.

Estimated Cost: $ 500

❑ Remove the vegetation on both sides of the road to the south of the site. This vegetation blocks the motorist's view of the pedestrians at the trail crossing.

Estimated Cost: $1,000

❑ Enlarge the parking lot to accommodate at least 20 vehicles.

Estimated Cost: $5,000

❑ Install a stop sign on the west approach to the intersection and at the entrance to the parking lot.

Estimated Cost: $ 500

Total Estimated Cost: $8,400

Site 8 - VA234 & Featherbed Lane

Site Description: This site is located near the north Park boundary on VA234. The general location of the site is shown in FIGURE 7-1. The site consists of the "T" intersection of VA234 and Featherbed Lane. Traffic volumes on VA234 through the site are estimated to be approximately 9,400 VPD, while Featherbed Lane carries about 500 VPD. Both roads are paved at the intersection, although Featherbed Lane turns into a gravel road about one hundred feet west of the intersection. VA234 has a posted speed limit of 55 MPH through the site. Both the north and south approaches to the intersection are equipped with curve warning signs that also show the intersection on the sign face. These signs are accompanied by 40 MPH advisory speed plates. The maximum safe speed for this curve was determined to be 40 MPH through the use of a ball bank indicator. A general layout of the site is presented in FIGURE 7-16 and photos of the site are shown in FIGURE 7-17.

Problems:

- The problems at this site are related to sight distance, traffic volumes, and vehicle speeds on VA234.
- The stop sign at this site is undersized.
- The intersection is not visible to approaching drivers on the north and south approaches.

Recommendations:

❑ Enforce the posted speed limit through this site.

Estimated Cost: Unknown

❑ Trim the tree branches and other vegetation that block the driver's view of the stop sign when approaching the intersection from the west. The stop sign should be visible for 300 feet in advance of the intersection. Maintain the south side of the west approach to insure this vegetation does not grow back.

Estimated Cost: $ 500

❑ Remove the trees and brush that are located on the west side of VA234 north of the intersection. These trees block the sight distance from the stop sign looking north. They also block the driver's view of the intersection when approaching from the north.

Estimated Cost: $1,000

❑ Replace the existing stop sign with a standard 30" x 30" stop sign.

Estimated Cost: $ 250

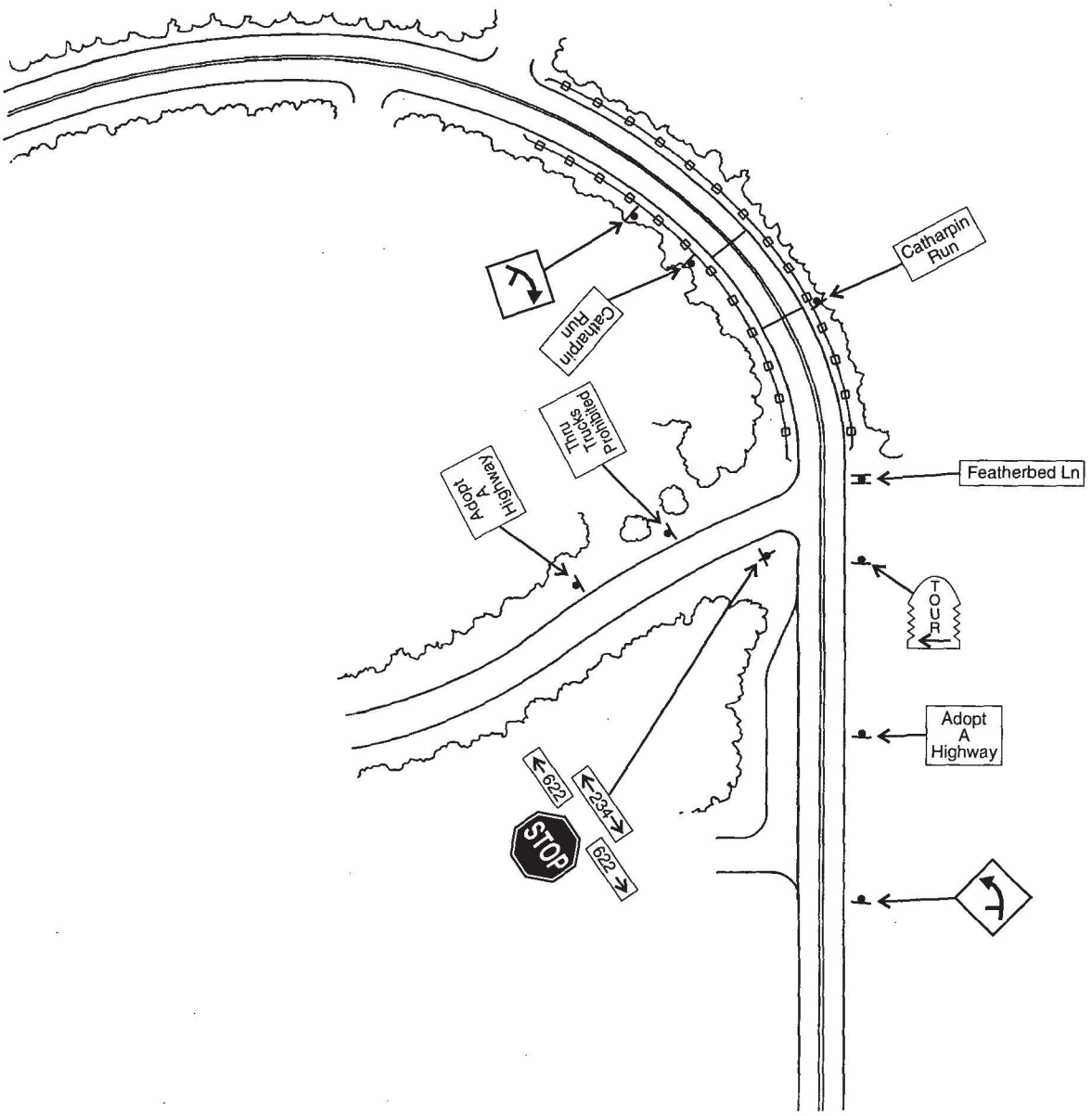
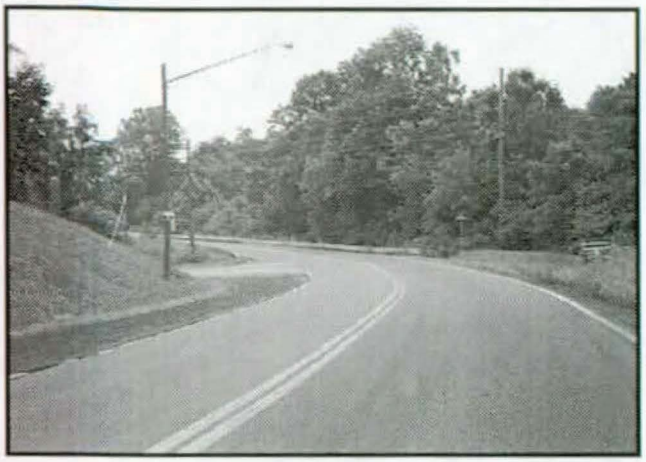


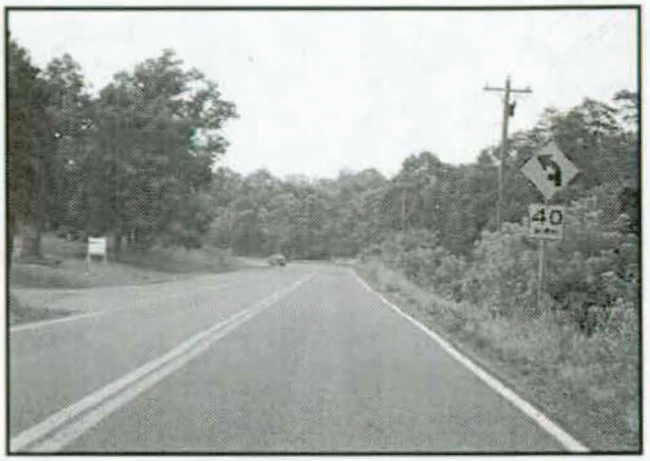
Figure 7-16:
Site 8 - VA 234 & Featherbed Lane

Not To Scale

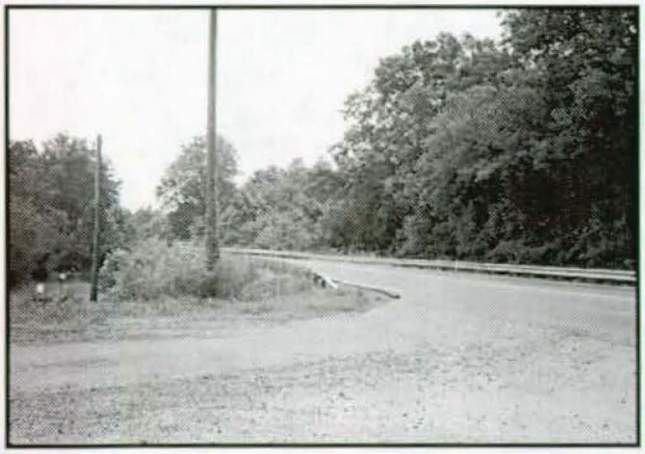
Manassas National Battlefield Park, Transportation Study



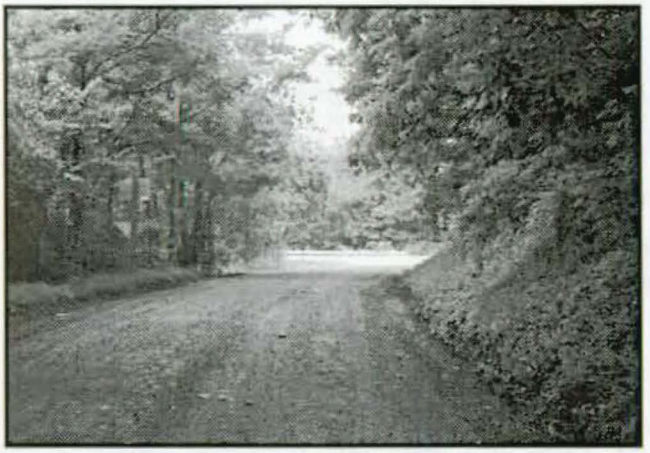
The intersection of VA 234 and Featherbed Lane is located in a curve. The side road can be seen on the left in this photo. Notice that the earth embankment on the left blocks the driver's view of the side road.



A warning sign that combines the curve and the intersection in the sign message is posted on the south approach to the site on VA 234. A maximum speed of 40 MPH is advised. Similar signs are posted on the north approach to the site.



The driver's view of the north approach is blocked by brush and other vegetation located along the west side of VA 234.



The Featherbed Lane approach from the west is gravel. Roadside vegetation blocks the driver's view of the stop sign on the approach to this intersection.

Figure 7-17: Photo Page, Site 8

❑ Install a stop ahead warning sign 250 feet back from the intersection on the west approach.

Estimated Cost: $ 250

❑ Install "T" intersection warning signs 300 feet in advance of the intersection on the north and south approaches. It is noted that the intersection configuration is currently shown on the existing curve warning signs. The intersection is not prominent enough on the sign face to be effective.

Estimated Cost: $ 500

❑ Remove the street sign located on the east side of the intersection and replace it with a similar but larger sign (12" x 30") indicating Featherbed Lane.

Estimated Cost: $ 350

❑ Remove a portion of the embankment on the southeast corner of the intersection.

Estimated Cost: $10,000

Total Estimated Cost: $12,850

SITE 9 - Sudley

Site Description: The Sudley parking area is located near the northern border of the Park on the west side of VA234. The site is used to interpret Sudley Church, located to the north of the parking area, and the Unfinished Railroad. The parking area is a small, irregularly shaped, paved lot. The estimated capacity of the lot is six vehicles. The site is located on a straight, level section of VA234. The posted speed limit on VA234 is 55 MPH through the site. The average weekday traffic volume through the site is approximately 11,600 VPD. The Sudley Trail leads east from the road beginning across from the site. There is a volunteer trail leading north through the grass to the church site. A sketch of the site is shown in FIGURE 7-18. Pictures of the site are shown in FIGURE 7-19.

Problems:

- This site is difficult to see from both approaches to the site.
- The vehicle speeds on VA234 are of concern for accessing and egressing traffic, as well as for pedestrians crossing VA234 at this site.
- The shape of the parking area makes it difficult to maneuver and limits the capacity.
- There is no traffic control at this site.

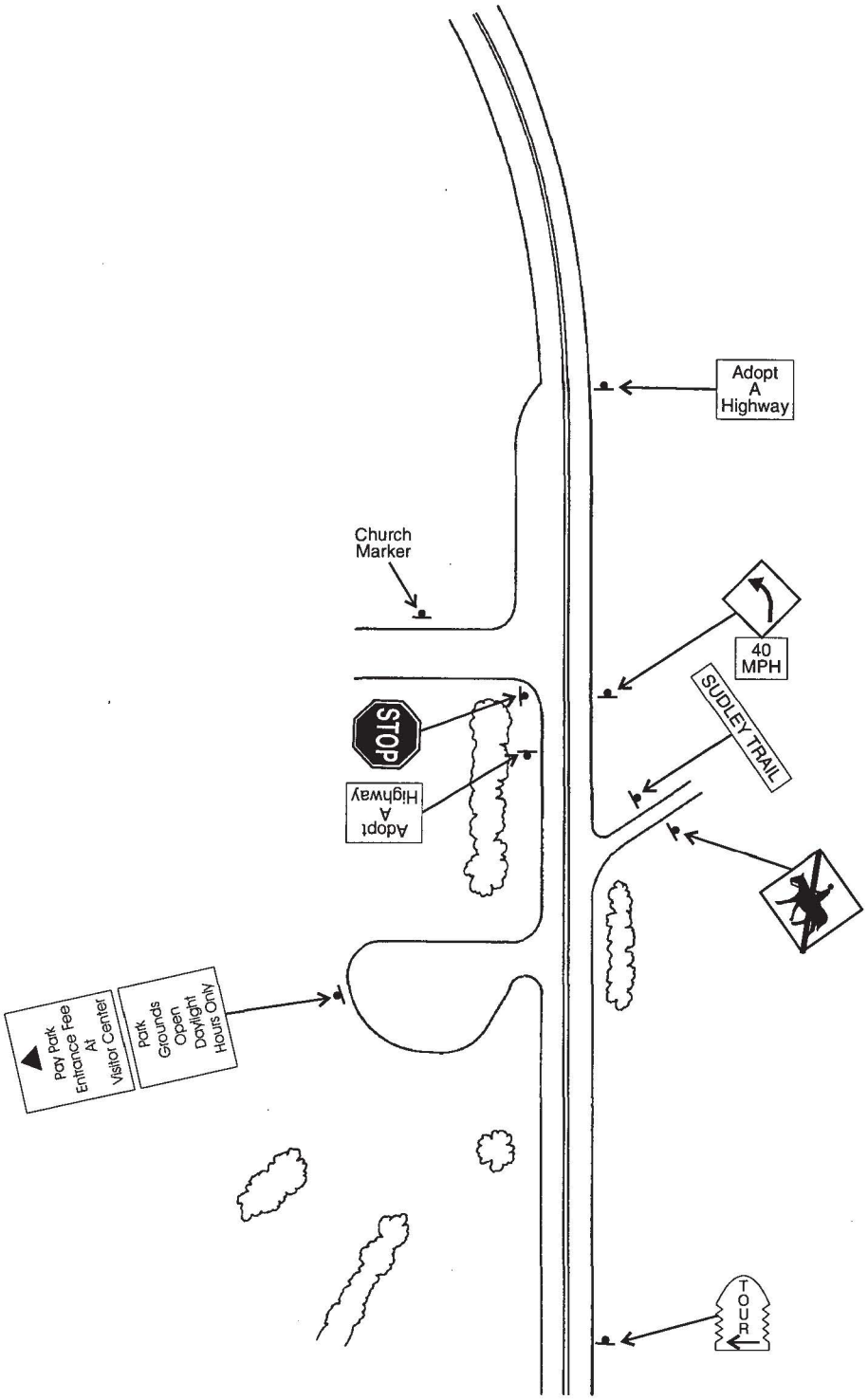


Figure 7-18:
Site 9 - Sudley

Not To Scale

The parking area at Sudley is a small irregular shaped, paved lot that holds up to four vehicles. This site is located adjacent to the Sudley Church that is just outside the Park boundary. The Church cemetery can be seen in this photo.

The approach to the site from the north is straight with good sight distance. The entrance to the Sudley Church is located adjacent to the entrance to the site. The deceleration lane shown in this photo has been provided for the church access and not for access into the NPS site.

The south approach is straight and level with good sight distance. Passing is restricted through this site on VA 234. Notice that there is no advance warning for this site.

The Sudley Trail begins on the east side of VA 234 across from the site. There are no pedestrian warning signs at this site.

Figure 7-19: Photo Page, Site 9

Recommendations:

❑ Install brown and white guidance signs on both approaches indicating the Sudley site.
Estimated Cost: $ 700

❑ Install a bi-directional brown and white guidance sign on the east side of the road across from the site that indicates the location of the access into the Sudley site.
Estimated Cost: $ 700

❑ Install pedestrian warning signs on both approaches to the site. The crossing location is a good one with respect to sight distance. The use of Sudley Trail is estimated to be relatively low. Estimated Cost: $ 500

❑ Install a stop sign at the exit to the parking area.
Estimated Cost: $ 250

❑ Cut the grass short along the west shoulder of VA234 on both sides of the approach. This grass limits the driver's sight distance if it is allowed to grow unchecked.
Estimated Cost: Unknown

❑ Increase enforcement of the speed limit in the vicinity of this site.
Estimated Cost: Unknown

Long Term Improvements

❑ Enlarge and square off the parking area slightly in order to achieve a shape that allows vehicles to turn around when six vehicles are in the parking area. The redesign of the parking area should include parking for six vehicles, plus vehicle maneuvering room. Install concrete pin-down curb stops to identify the desired parking pattern.
Estimated Cost: $10,000

❑ Consider combining the Sudley interpretive site with the church to the north. It would be nice if the interpretive area was closer to the church. From a traffic point of view it is desirable to minimize the number of roadside access points. The existing access to the church is equipped with a southbound deceleration lane and is located about 200 feet to the north of the Sudley site. The NPS interpretive site could be relocated farther north or retained at the existing location.
Estimated Cost: Unknown

Total Estimated Cost: $12,150

SITE 10 - Dogan Ridge

Site Description: This site consists of the two parking areas on Dogan Ridge adjacent to VA234. The site is located approximately a half mile north of the intersection of US29 and VA234. VA234 carries about 10,000 VPD on the weekends and 11,600 VPD on weekdays. One parking lot is adjacent to VA234, while the other lot is located in the field to the west. The wast lot is accessible via a gravel access road. Both lots have a gravel surface. FIGURE 7-1 shows the general location of the site within the Park.

The roadside parking area is on the west side of the road and is accessed at two points directly from VA234. The west lot is accessed by a gravel road that intersects VA234 fifty feet north of the roadside parking area. There are both vertical and horizontal changes in the road alignment of VA234 adjacent to this site. The roadside parking lot access points are on the outside of the curve and just south of the crest of the hill. Photos of the site are presented in FIGURE 7-20 and a site sketch is shown in FIGURE 7-21.

The area is used regularly for picnicking and other outdoor activities. Picnic tables and trash cans are provided. There is a trail leading towards several cannons in the field to the east from this site. The trail begins on the far side of the road away from the roadside parking lot, requiring visitors to cross the highway.

Problems:

- The posted speed limit through this site is 45 MPH. A spot speed analysis of the vehicle approach speeds at this site indicated that the average vehicle is traveling between 48 and 50 MPH.
- There are two access points into the site from VA234. The southern most access is about 30 feet wide while the northern access is over 100 feet wide. The dual accesses, especially the wide northern access, provide the driver with too many options for access and egress. This leads to driver confusion and an unpredictable access and egress pattern.
- The sight distance at this site is limited by the embankment on the inside of the curve. This limits the sight distance for access and egress of the site and pedestrian crossings of the highway.
- The pedestrian crossing of VA234 at this site is hazardous due to the limited sight distance in the curve of the road.
- The parking area has no designated parking or circulation pattern.
- On weekends and summer evenings this parking area fills to near capacity.

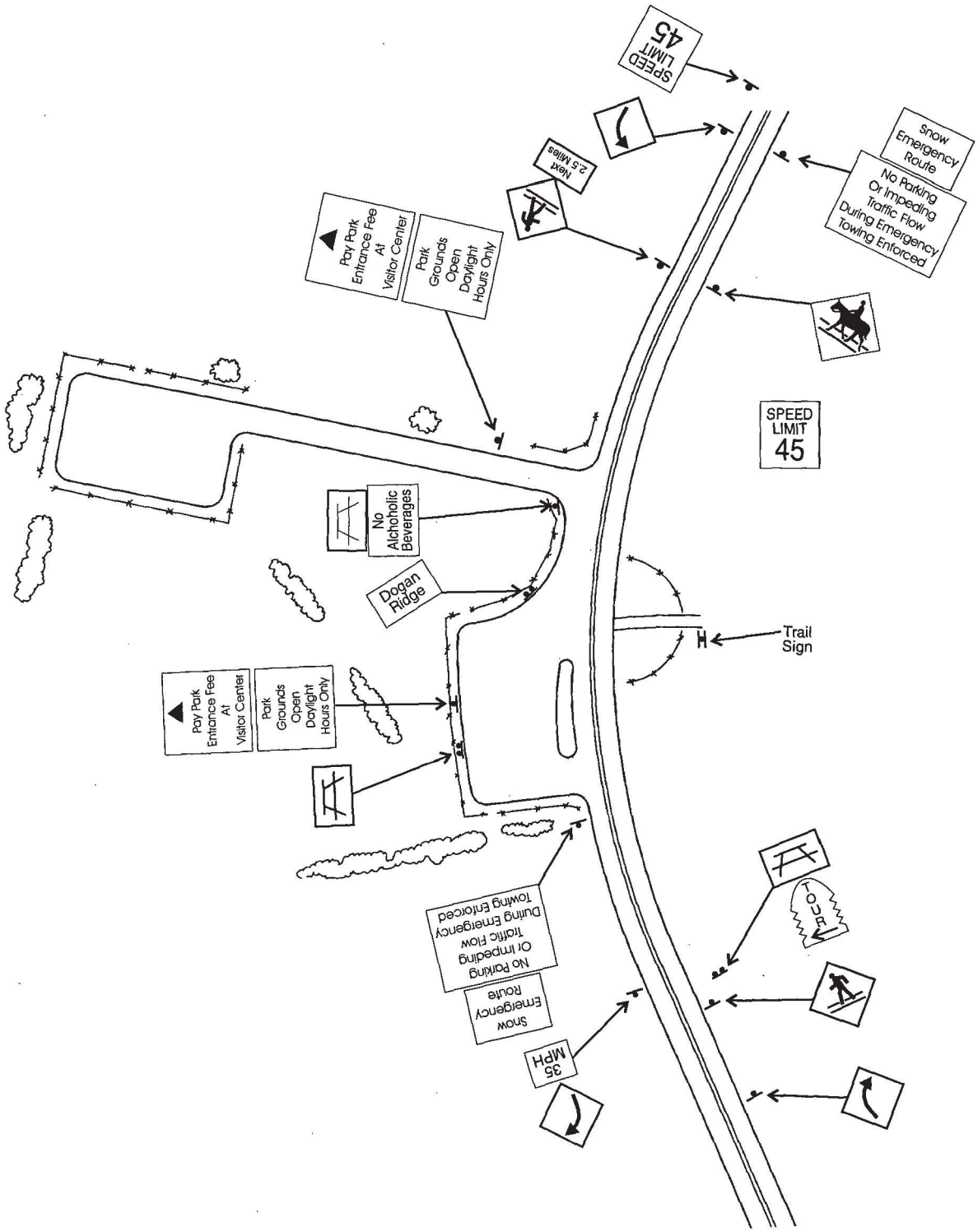


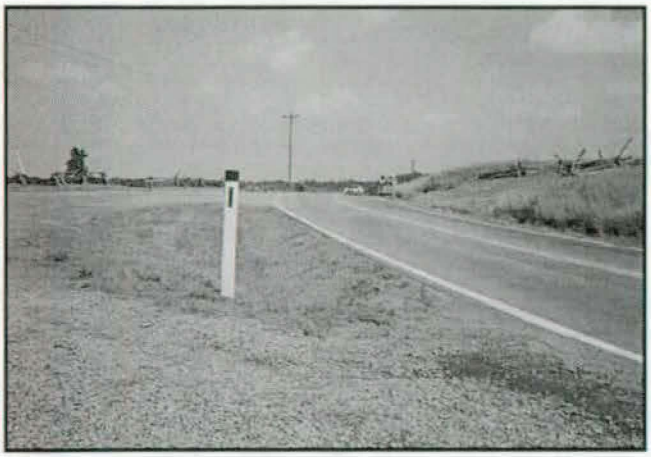
Figure 7-20:
Site 10 - Dogan Ridge

Not To Scale

Manassas National Battlefield Park, Transportation Study

The site at Dogan Ridge consists of the roadside gravel pullout shown in this photo and a separate parking lot located in the adjacent field. The random parking patterns occur in both parking areas.

The off-road parking area is rectangular in shape, and accessed via the connecting road shown in this photo.



This site is located on a curved section of VA 234. The parking area is shown on the left in this photo. A trail leading toward several cannons in the field east of the road is shown on the right side of the road. Sight distance is limited at this location which makes crossing the road difficult.

This picture shows the driver's view of the north approach when exiting the site from the side access road that leads to the off-road parking area. This photo was taken from the north end of the site. The sight distance is severely limited at the southern access due to the curve in the road.

Figure 7-21: Photo Page, Site 10

Recommendations:

❑ Increase the enforcement of the speed limit on VA234 in the vicinity of this site.

Estimated Cost: Unknown

❑ A split rail fence should be installed on the east side of the road to discourage pedestrian crossings. Caution should be used when placing the fence to insure that it does not block the sight distance in the curve.

Estimated Cost: Unknown

❑ Grass growing on the back slope on the inside of the curve should be maintained so it does not cause a reduction in the available sight distance. A less-desirable option would be to flatten the back slope to reduce the sight distance obstruction for pedestrians and vehicular drivers. This may not be advisable because it would require altering the historic battlefield landscape.

Estimated Cost: $10,000

❑ Install pin-down concrete curb stops in both parking areas delineating the desired parking configuration. The visitors typically park head-in along the perimeter of the lots. An additional double aisle down the middle of the roadside parking lot will provide extra capacity and help channelize the traffic within the lot.

Estimated Cost: $7,500

❑ Install Brown and white guidance signs 300 feet from the site on both approaches identifying the Dogan Ridge picnic Area.

Estimated Cost: $ 700

Long Term Improvement

❑ Eliminate both direct approaches from VA234. Reconstruct the access into this parking area so that the only access is from the road leading to the picnic area in the field to the north. The new access should be controlled with a stop sign. FIGURE 7-21 shows the recommended site access. Construct a formalized "T" intersection that will serve both picnic areas. The west approach to the intersection should be paved. The traffic should be controlled through the use of stop signs. A painted stop bar and a short painted centerline should be installed on the west approach. The current access points should be removed and revegetated. A split rail fence should be installed along the outside of the curve to encourage the desired access and discourage pedestrian crossings of VA234.

Estimated Cost: $13,000

❑ Consider constructing a new parking area and interpretive site on the east side of

VA234. A possible location for this new site is about a half mile north of Dogan Ridge. The existing hiking trails in the area should be relocated to connect with the new parking area.

Estimated Cost: Unknown

❑ Consider relocating the picnic area to another area of the Park to be evaluated as part of the General Management Plan. Existing hiking trails in the area of the new site should be relocated to connect with the parking area.

Estimated Cost: Unknown

Total Estimated Cost: $31,550

Site 11 - Curve on VA234

Site Description: This site consists of a curved section of VA234 that is located on a 5% - 6 % grade approximately 0.2 miles north of the signalized intersection of VA234 and US29. FIGURE 7-1 shows the location of the site within the Park. This section of VA234 has a posted speed limit of 45 MPH. This site is equipped with large, curve warning signs, along with 35 MPH advisory speed plates. There are two arrow warning signs facing each direction located in the curve. Passing is prohibited through the site. The physical features of the site are shown in FIGURE 7-22. Site photos are presented in FIGURE 7-23.

Problems:

- Tree branches obscure the driver view of the curve warning sign and one of the arrow warning signs when approaching the site from the south.
- According to discussions with Park staff and county police, this location is the site of numerous accidents.

Recommendations:

❑ Trim the branches that obscure the driver's view of the signs on the south approach.

Estimated Cost: $ 500

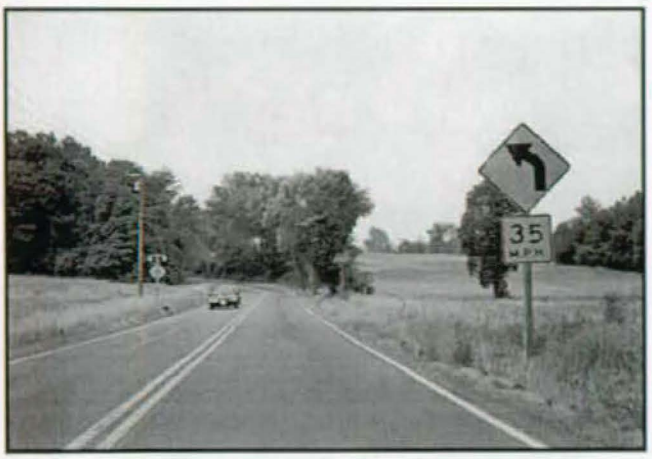
Not To Scale

Figure 7-22
Site 11 - Curve on VA 234

Manassas National Battlefield Park, Transportation Study

This photo shows the driver's view of the curve at this site. The 35 MPH advisory speed was verified with a Ball Bank Indicator as being the appropriate safe speed for this curve.

The curve at this site is equipped with two direction arrow warning signs. Passing is restricted throughout the site.



The driver has a good view of the curve from the south approach. The curve warning sign and advisory speed plate are considered appropriate advance signing for the conditions at this site.

One of the direction arrow warning signs presented on the south approach can not be seen clearly due to the roadside vegetation.

Figure 7-23: Photo Page, Site 11

❑ Remove the four arrow signs located in the curve and replace them with five bi-directional chevron warning signs. Install the chevrons on the outside of the curve with a 75- foot spacing. The signs should be placed so that three signs are visible on the approach to the curve from both directions.

Estimated Cost: $2,700

Total Estimated Cost: $3,200

Site 12 - Stone House

Site Description: This site consists of the parking area that serves the historic Stone House located on the northeast corner of the intersection of US29 and VA234. The parking area is paved but in poor condition. The lot has two access points; one on US29, and one on VA234. FIGURE 7-1 shows the location of the site within the Park. The parking area is bordered on the north and east sides by a split rail fence that keeps the vehicles contained within the designated parking area. This parking area is heavily used on most days and operates at or near capacity on the weekends. There is a one hour parking limit at this site. FIGURE 7-24 shows the existing site layout and physical features. FIGURE 7-25 contains several photos of the site.

Problems:

- The access points for this intersection are too close to the signalized intersection of US29 and VA234.
- Turning movements into and out of the parking area create vehicle conflicts that adversely impact the safe and efficient operation of the signalized intersection.
- The parking area is too small for the demand.
- Field observations indicate that when the lot is full visitors park on the south side of US29, across from the Stone House, and walk across the Highway to access the site.
- The desired parking pattern has not been designated at this lot, and therefore, various parking patterns occur during the day.
- There is no advance signing or site signing for this historic landmark.
- Several trails lead off from the site leading up the hill to the north. There is also a trail that leads toward the south, crossing the intersection. There are no provisions for pedestrians at this signalized intersection.

Recommendations:

❑ Close the approach to the parking area from US29. Install split rail fencing to help enforce the closure. Revegetate the closed access.

Estimated Cost: $2,000

❑ Install an advance guidance sign on the north approach.

Estimated Cost: $ 350

❑ Install guidance sign for the site across from the remaining access on VA234.

Estimated Cost: $ 350

❑ Relocate the pedestrian crossing of US29 to a new location 200 feet to the east of the intersection.

Estimated Cost $2000

Long Term Improvement:

❑ Move parking lot to the east side of the Stone House. The new parking lot should be sized to accommodate at least 25 vehicles. The lot should gain access via an access road that leads to an intersection with US29. The access road should be located as far from the intersection as possible. At that time, advance guidance signing should be installed on both approaches on US29. The guidance sign for the site should be installed across the street from the new access. The pedestrian crossing of US29 should be located adjacent to the new access to the proposed parking area.

Estimated Cost: $50,000

Total Estimated Cost: $54,700

Site 13 - VA234 & Visitor Center Access Road

Site Description: This site consists of the four-way intersection of VA234, the access road leading to the Visitor Center, and the road leading to Chinn Ridge. FIGURE 7-1 shows the general location of the site within the Park. All of the roads at this site are paved. The average traffic volumes on VA234 are estimated to be approximately 15,000 VPD, while the volumes on the east and west legs of the intersection are estimated to be 700 and about 200 VPD respectively. The two side roads are offset by about 75 feet. Both side roads are closed at dark. FIGURE 7-26 shows the site layout. Pictures of the site are presented in FIGURE 7-27.

Problems:

- The speed of the traffic and the traffic volume on VA234 makes this intersection a problem for visitors.
- Southbound vehicles have difficulty making left turns into the site. Sight distance is blocked by vegetation on the northwest corner of the intersection.
- The stop signs are undersized and there are no stop bars.

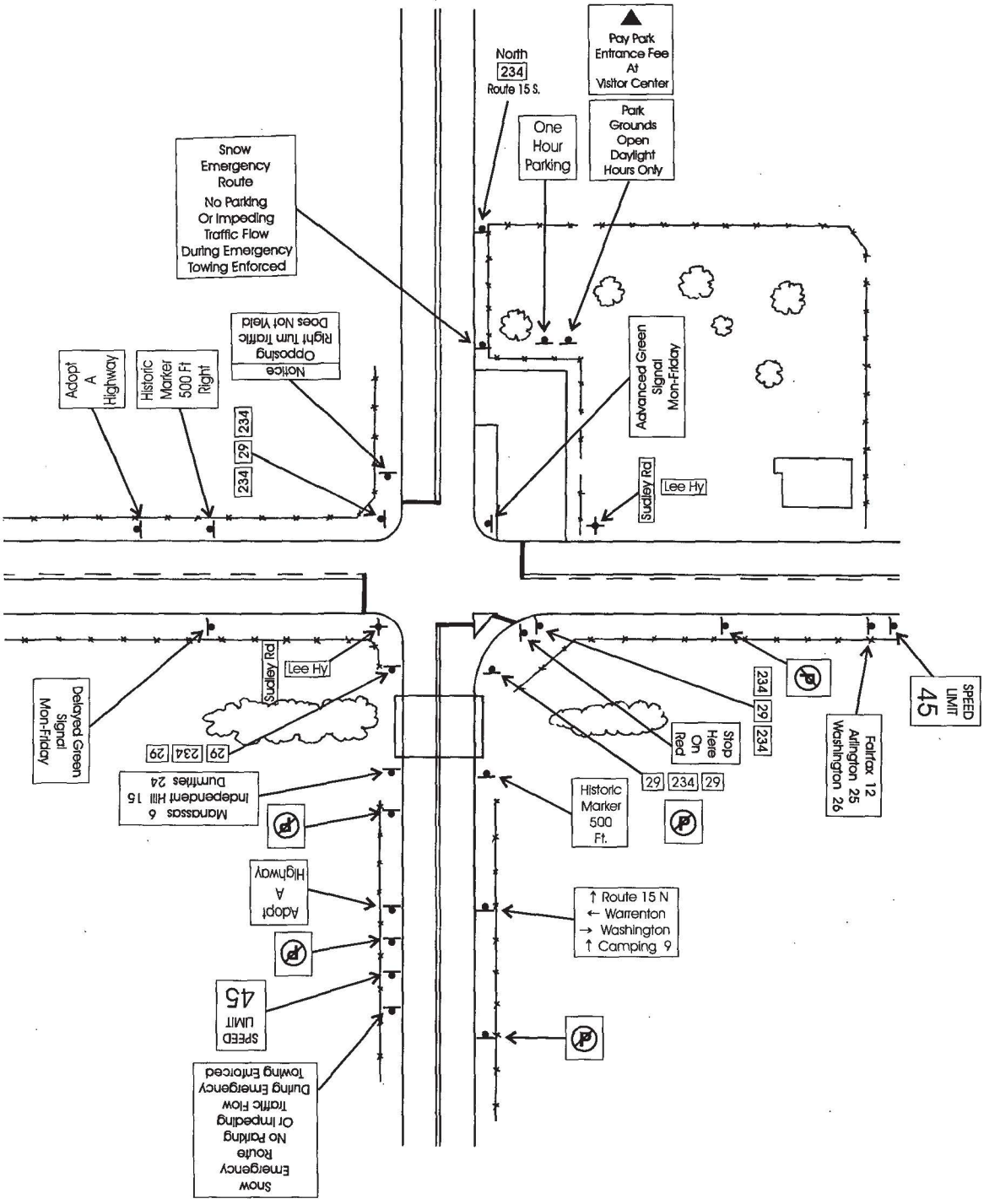
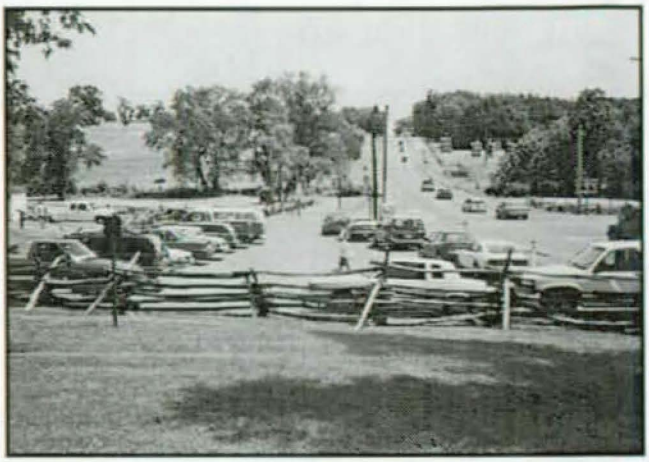


Figure 7-24:
Site 12 - Stone House

Not To Scale

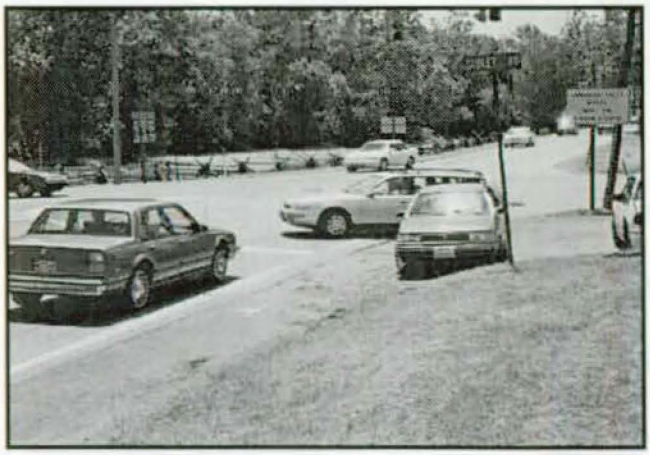
Manassas National Battlefield Park, Transportation Study

The Stone House parking area is located on the northeast corner of the US 29/VA 234 intersection. The parking area is rectangular in shape and can be accessed from both roads.



The parking area often fills to capacity (15 vehicles) which creates traffic congestion within the parking area. There are no pavement markings in the parking lot indicating the desired parking pattern.

The Stone House has always been a landmark in this region and as a result the parking area is often used as a meeting place for travelers. The split rail fence around the perimeter of the lot prevents vehicles from parking outside the designated area.



The parking lot access points are so close to the intersection that vehicles entering and exiting the lot interfere with the operation of the signalized intersection. Notice the location of the parked vehicle that is essentially parked on the shoulder of the road due to the lack of adequate space in the lot.

Figure 7-25: Photo Page, Site 12

- The advance warning of the intersection and the location of the Visitor Center is inadequate on the north, south, and west approaches.

Recommendations:

❑ Increase enforcement of the speed limit on this section of VA234.

Estimated Cost: Unknown

❑ Trim the vegetation (grass, tree branches and shrubs) on the west side of VA234 on the north and south sides of the intersection. Continue to crop the grass close to the ground in this area on a regular basis. This vegetation blocks the sight distance of drivers trying to enter or cross VA234 from the west approach. This vegetation also blocks the drivers' view of the intersection when approaching on VA234.

Estimated Cost: $ 500

❑ Trim the tree limbs on the west approach that block the driver's view of the stop sign.

Estimated Cost: $ 500

❑ Trim the grass and tree limbs on the west side of VA234. This vegetation blocks the driver's view of the intersection when approaching on VA234 and it blocks the sight distance for drivers attempting to access or cross VA234 from the Visitor Center.

Estimated Cost: $ 300

❑ Remove and replace the undersized stop signs on the east and west approaches with standard "30 x 30" stop signs. Install painted stop bars adjacent to both stop signs.

Estimated Cost: $ 900

❑ Install a brown and white guidance sign on the east approach for westbound traffic exiting the Visitor Center. The sign should indicate the proper direction of the Stone House, Chinn Ridge, and I-66. Install the sign about 250 feet east of the intersection.

Estimated Cost: $ 350

❑ Install a brown and white guidance sign on the west approach for east-bound traffic. The sign should indicate the proper direction of the Stone House, the Visitor Center, and I-66. Install the sign about 200 feet west of the intersection.

Estimated Cost: $ 350

❑ Install a stop ahead sign 300 feet in advance of the intersection on the west approach.

Estimated Cost: $ 250

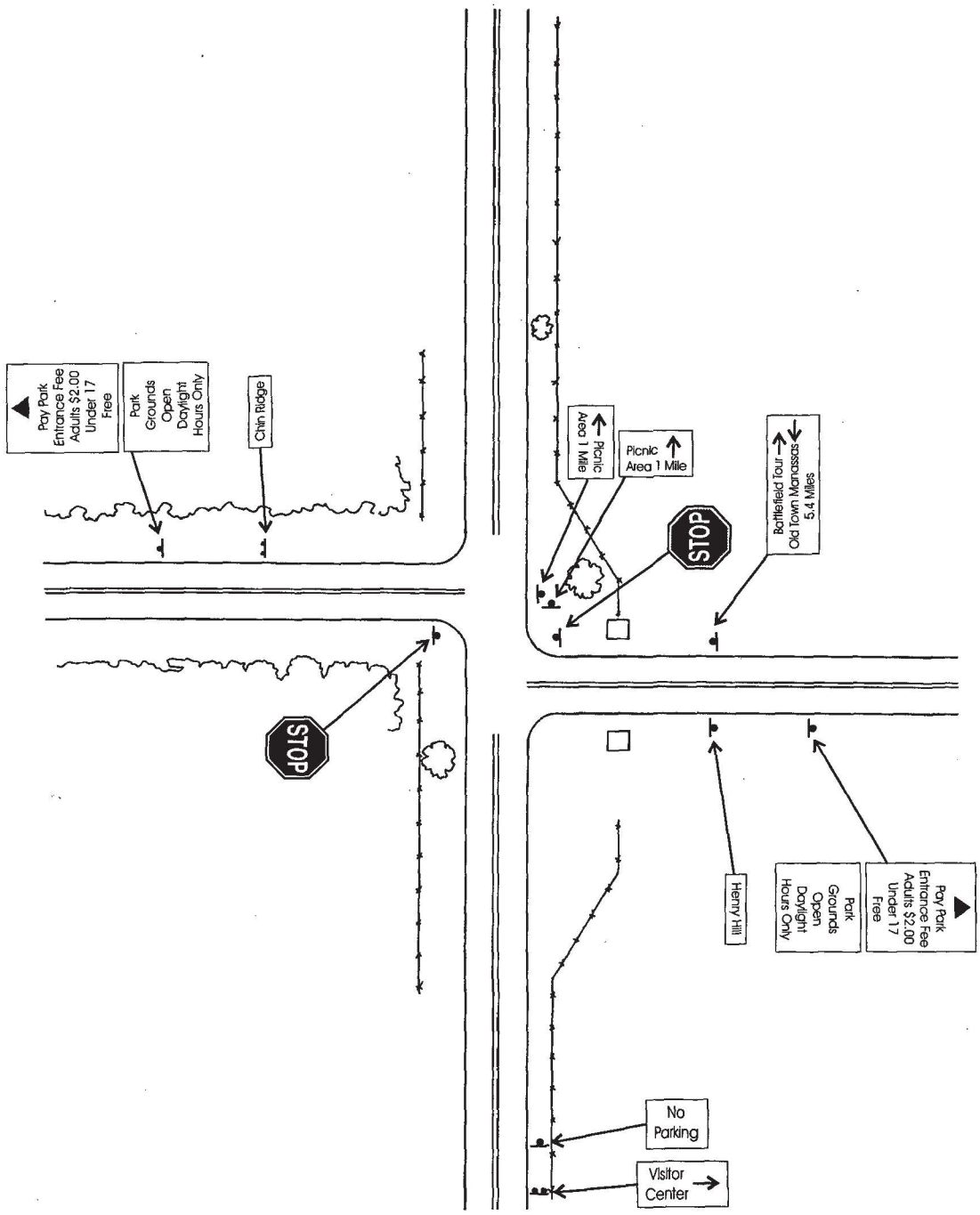


Figure 7-26:
Site 13 - VA 234 & Visitor Center Access Road

Not To Scale

Manassas National Battlefield Park, Transportation Study

The site is the intersection of VA 234 and the Visitor Center Access Road. The side road approach from the Visitor Center is controlled by a stop sign. The Access Road is not equipped with a centerline or painted stop bar.

This photo shows a vehicle approaching the intersection from the west. Notice how the west approach is off-set from the east approach.

The approach to the intersection from the north is straight and equipped with an advance guidance sign. Passing is restricted on VA 234 throughout the site.

This photo shows the driver's view of the south approach. Although the approach is straight and has reasonable sight distance, the approach speeds of the vehicles combined with the overall traffic volume, make it difficult for motorists to access and egress VA 234 at this site.

Figure 7-27: Photo Page, Site 13

❑ Remove and replace the existing brown and white guidance signs on the north and south approaches with larger signs indicating the location of the Visitor Center. The signs should be installed about 300 feet from the intersection.

Estimated Cost: $ 900

❑ Install intersection warning signs on both the north and south approaches. Install these signs approximately 500 feet from the intersection.

Estimated Cost: $ 500

Long Term Improvement:

❑The two side road approaches could be realigned so that they line up. However, this may not be advisable because it would require altering the historic battlefield landscape.

Estimated Cost: $100,000

Total Estimated Cost: $104,550

Site 14 - Visitor Center Parking Area

Site Description: This site includes the parking area at the Visitor Center. The location of the site is shown in FIGURE 7-1. The approach road is about 0.1 mile long and paved. The parking lot is also paved with internal turf landscaped median islands. The parking lot has a capacity of 84 vehicles (which includes two handicapped spaces). A variety of trails lead away from the Visitor Center in several directions. During the summer months visitor fees are collected at the entrance to the parking area. There are two parking spaces reserved for handicapped visitors. The parking spaces are delineated through the use of pin-down concrete curb stops. There is also a paved semi-circular driveway that goes in front of the Visitor Center. The physical features of the site are shown in FIGURE 7-28. Photos of the site are shown in FIGURE 7-29.

Problems:

- The parking area does not have a traffic circulation pattern indicated.
- There is no designated parking for oversized vehicles or buses.
- The lot is undersized for the weekend.
- Field observations conducted on several weekend days indicate that ten to twenty additional parking spaces are required to meed the current demand. Overflow parking is currently accommodated by parking vehicles in the field to the south of the lot and along the edge of the semi-circular drive in front of the Visitor Center.
- The fee collection booth is within the parking area and does not capture all entering visitors. Numerous vehicles were observed driving into the lot without paying the Park entrance fee.

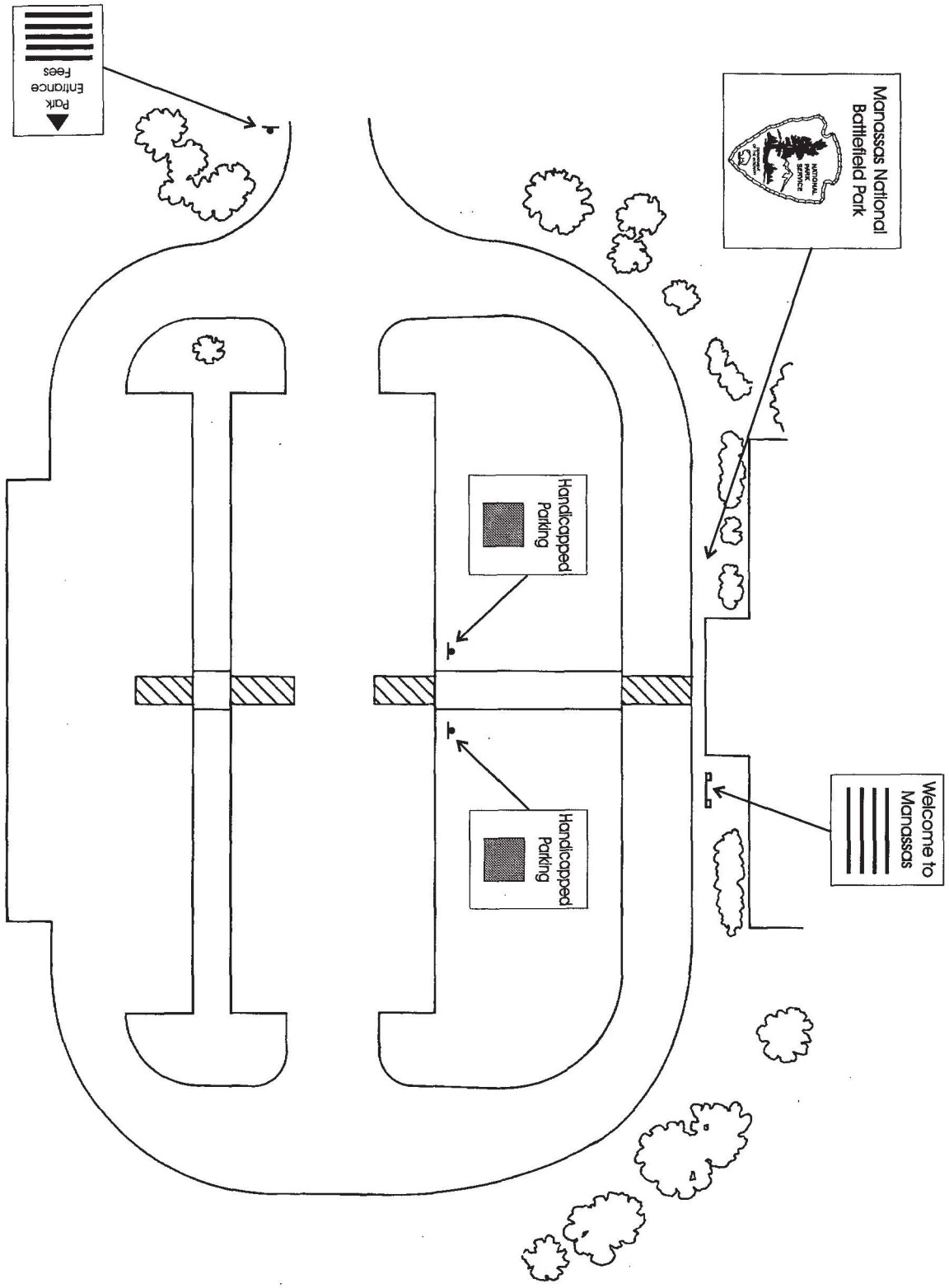


Figure 7-28:
Site 14 - Visitor Center Parking Area

Not To Scale

The parking area at the Visitor Center is the largest within the Park with a capacity of 84 spaces. When the parking lot fills to capacity vehicles tend to park on the turf areas adjacent to the parking lot.

A pedestrian walkway has been provided down the center of the parking area. The white pavement markings restrict vehicle parking within the walkway. Notice that the pavement markings do not include an actual painted pedestrian crosswalk.

The entrance to the parking area is confusing to some visitors. During the peak months the visitor fee is collected in the parking area using the kiosk shown on the right in this photo. During these times the desired counter-clockwise traffic circulation pattern within the lot is identified through the use of movable signs. At all other times there is no indication of the traffic circulation pattern.

The process of collecting fees can cause some minor traffic delays. The kiosk is located on the south side of the parking area near the entrance.

Figure 7-29: Photo Page, Site 14

Recommendations:

❑ Develop a one-way counter-clockwise traffic circulation pattern within the parking lot through the use of a series of white pavement arrows and a "Keep Right" sign located at the entrance to the parking area.

Estimated Cost: $1,500

❑ Install a brown and white directional sign indicating the correct direction to the oversized vehicle and bus parking areas. Install the sign at the entrance to the parking lot. An additional bus parking sign will be required on the east end of the parking lot, directing buses toward the bus parking area on the semi-circular drive.

Estimated Cost: $ 500

❑ Establish one bus parking space on the semi-circular drive west of the entrance to the Visitor Center. Install two "Bus Parking Only" signs delineating the segment of the semicircle that will be used by buses. Note that the buses will have to park (at least partially) on the grass due to the narrow pavement width. The parking spaces should be delineated using a 60 foot long white shoulder line installed one foot from the edge of pavement, with hatch marks at both ends extending between the paint line and the edge of pavement. Paving the bus parking area is mentioned in the long-term improvement.

Estimated Cost: $ 500

❑ Designate four oversized vehicle spaces (each 60 feet long) along the east edge of the parking lot. It will be necessary for these vehicles to park on the shoulder of the paved area. This will require two brown and white signs indicating "RV and Trailer Parking Only Between Signs." Note that the oversized vehicles will have to park on the grass parallel to the road. This is due to the narrow road width. The parking spaces should be delineated using a white shoulder line, installed one foot from the edge of pavement, with hatch marks every 60 feet on the outside edge between the paint line and the edge of pavement. Providing a paved parking area for oversized vehicles is mentioned in the long-term improvement below.

Estimated Cost: $ 500

❑ Install white painted lines that delineate the vehicle parking spaces in the lot. This will help drivers recognize the individual spaces and prevent vehicles from taking up more than one space. This will also help to achieve maximum capacities.

Estimated Cost: $2,000

❑ Install a painted pedestrian crosswalk that begins in front of the Visitor Center and continues south through the entire parking area. Estimated Cost: $ 750

❑ Provide four handicapped parking spaces in the lot. According to the American's with Disabilities Act (ADA) accessibility guidelines, a parking lot that has between 76 and 100 parking spaces should have four spaces set aside for the Handicapped.

Estimated Cost: $1,000

Long Term Improvement:

❑A less-desirable option would be to enlarge the paved parking area so it is sized to accommodate 120 cars, two buses, and four RV's or vehicles with trailers. Because the Visitor Center parking lot is in the heart of the battlefield on Henry Hill, any modifications to the lot would destroy key areas of the battlefield. Other measures (i.e., remote lots with shuttle service, relocating Visitor Center functions, etc.) should be analyzed before any consideration is given to expanding the lot.

Estimated Cost: $100,000

Total Estimated Cost: $106,750

Site 15 - Horse Trailer Parking Area

Site Description: This site is located on the north side of US29 about 0.5 miles east of the intersection of VA234. The general location of the site is shown in FIGURE 7-1. US29 in this area carries about 19,000 VPD and has a posted limit of 55 MPH. The site has two access points. The paved parking area has a semi-circular shape and is sized to accommodate about three vehicles with horse trailers and three passenger cars. The parking area is bounded by split rail fencing and has one horse hitching rail located between the fence and the paved area. There is a horse trail that crosses US29 at this site. FIGURE 7-30 shows the site physical features, and FIGURE 7-31 contains several photos of the site.

Problems:

- The speed and volume of traffic on US29 is a major problem for visitors using this site.
- Passing is allowed through this site by east-bound vehicles on US29.
- There is no advance signing or site signing for this parking area.
- There is a horse-crossing warning sign on the west approach located about 2000 feet west of the site.
- The sight distance to the west of the site is limited by a crest in the hill.
- The parking area is too small for horse trailer use and can only accommodate about three vehicles with trailers.

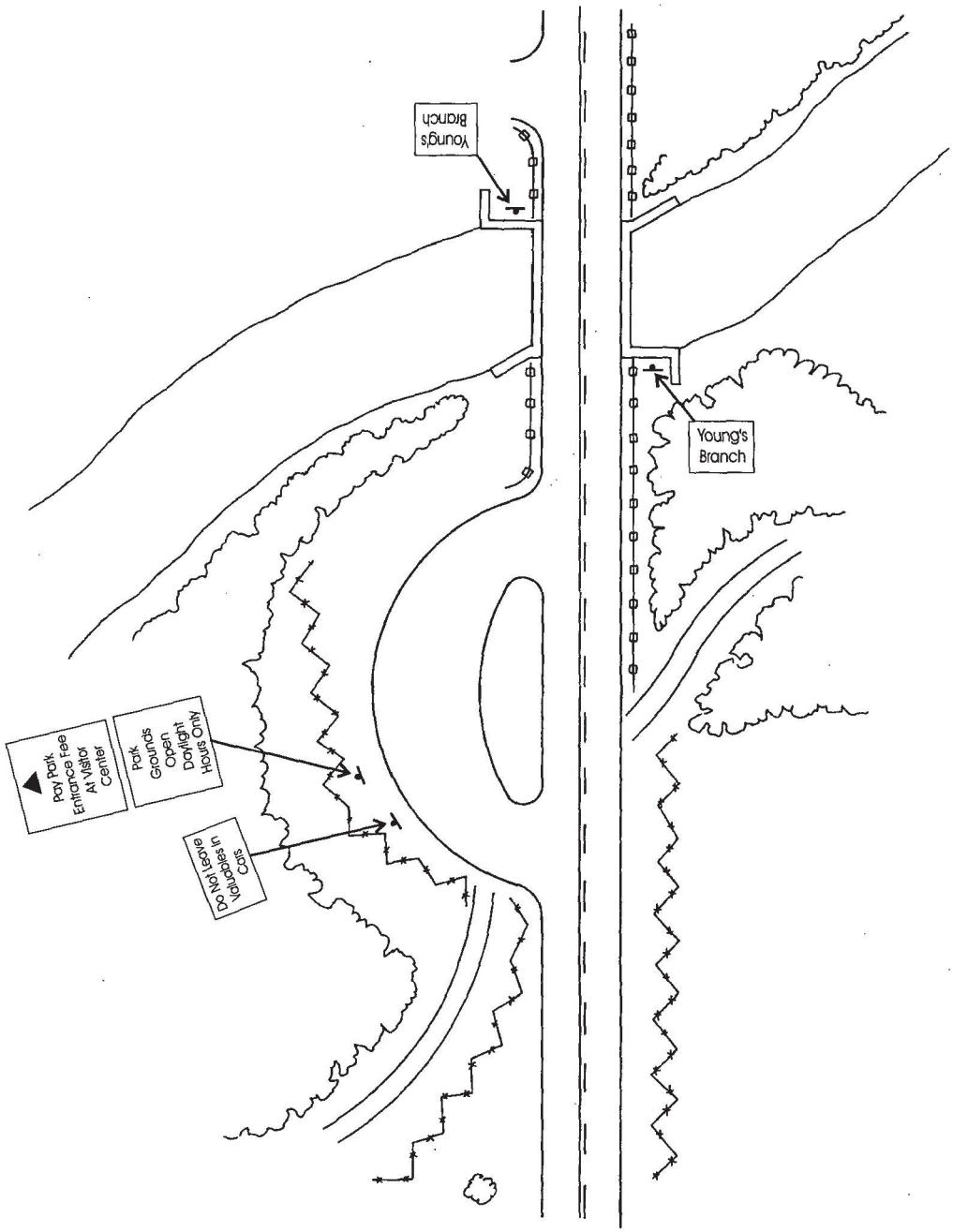


Figure 7-30:
Site 15 - Horse Trailer Parking Area

Not To Scale

The Horse Trailer parking area is paved and has a semi-circular shape. This area can hold about three trucks with horse trailers and three passenger vehicles.

The parking area is separated from US 29 by a concrete lined "V" shaped drainage ditch. This photo shows the drivers view of the west approach to the site on US 29. Notice that centerline markings allow eastbound vehicles to pass as they approach this site.

Sight distance is good on both approaches to this site. Both approaches are straight. The east approach is level while the west approach, shown in this photo, rises to crest in the road to the west. There is no advance site signing on either approach.

The horse riders tend to park their vehicles according to the limited space available. There are no pavement markings within the parking area at this site.

Figure 7-31: Photo Page, Site 15

Recommendations:

❑ Enforce the speed limit on US29 through this site.

Estimated Cost: Unknown

❑ Prohibit passing in both directions on US29 for a distance of at least 300 feet from the site.

Estimated Cost: $ 500

❑ Install brown and white advance guidance signs 300 feet from the site on both approaches.

Estimated Cost: $ 700

❑ Install a bi-directional brown and white site sign on the south side of US29 directly across from the parking area.

Estimated Cost: $ 700

❑ Install two stop signs at this site. Locate one sign on the right side of each exit.

Estimated Cost: $ 500

❑ Remove the existing horse-crossing warning sign on the west approach. Install standard 30" x 30" horse-crossing warning signs 500 feet in advance of the site on both approaches.

Estimated Cost: $ 600

❑ The parking area should be modified so it is deeper and better shaped to accommodate six vehicles with horse trailers. The lot should be designed so the vehicles can back into the spaces, allowing the horses to be unloaded at the back of the lot onto the grass. The trailer spaces should be marked with white paint lines. There also should be a space provided that is at least 20 feet from the back of the parking area where horses can be tied. It is desirable for this space to be in the shade if possible.

Estimated Cost: $10,000

Total Estimated Cost: $13,000

Site 16 - Stone Bridge West

Site Description: This site consists of the parking area located on the west side of Bull Run Creek adjacent to the historic Stone Bridge. The parking area is located on the north side of US29 on Virginia Department of Transportation right-of-way. FIGURE 7-1 shows the location of the site within the Park. The parking area is paved and has two access points connecting it to US29. The lot has an estimated capacity of 16 vehicles. FIGURE 7-32 shows the physical features of the site. FIGURE 7-33 contains pictures of the site.

Problems:

- The site signing is inadequate.
- The advance signing does not indicate the Stone Bridge in the sign message.
- That actual location of the parking area is difficult to identify when approaching from either direction on US29.
- The sight distance is limited by vegetation (tree limbs, shrubs, and tall grass) growing along the north side of the road on both approaches to the site.
- Passing is allowed on US29 in both directions through the site.
- The parking area approaches are poorly designed. The grade drops rapidly when entering the site. The grade of the parking area is two to three feet lower than the road.
- Evidence of vehicles scraping the asphalt are evident at both access points.
- The parking area does not have the parking spaces delineated.
- The parking area operates at or near capacity on weekends.

Recommendations:

❑ Remove the existing advance guidance signs and replace them with brown and white advance guidance signs that indicate "Stone Bridge - Next Left " and "Stone Bridge - Next Right." Install the signs 500 feet in advance of the site.

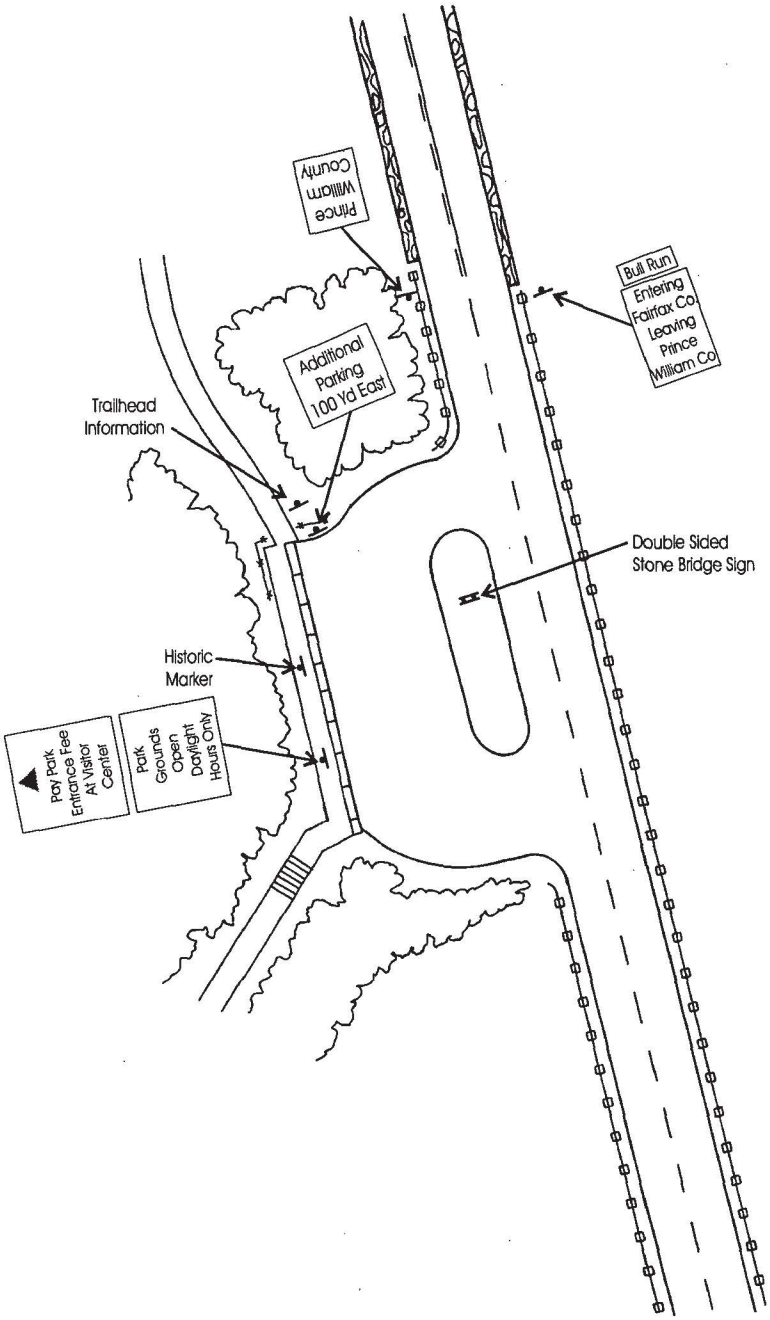
Estimated Cost: $ 900

❑ Remove the small site sign and replace it with a larger bi-directional brown and white site sign located on the south side of the road across the road from the parking area.

Estimated Cost: $ 800

❑ Remove all vegetation that obstructs the sight distance. The area to be cleared of vegetation is located along the north side of the road for 500 feet on both approaches. Maintain the vegetation in this area on a regular basis.

Estimated Cost: $1,000



Not To Scale

Figure 7-32:
Site 16 - Stone Bridge West

The Stone Bridge (West) parking area is located on a straight, level section of US 29. The parking area is separated from the roadway by a turf island. The site signing consists of the brown and white guidance sign and the blue and white tour sign shown in this photograph.

This photograph shows the driver's view of the west approach when attempting to exit the parking area. The roadside vegetation blocks the view of the approach.

This photograph shows wheel rutting on the median at the east end of the site. Drivers apparently have trouble accessing or exiting the site without driving on the median. Notice that the parking area is about two feet lower in elevation than the adjacent road. The transition from the road grade to the parking lot grade is somewhat abrupt.

The parking area has a paved surface and can hold about 16 vehicles. There are no pavement markings delineating the desired pattern at this site.

Figure 7-33: Photo Page, Site 16

❑ Restrict passing on both approaches to the site on US29.

Estimated Cost: $500

❑ Widen the east approach to the site by five feet. Widen the approach on the west side by removing a small portion of the earthen berm located between the road and the parking area.

Estimated Cost: $2,000

❑ Install two stop signs with accompanying painted stop bars at this site. Locate a sign on the right side of each exit point from the site.

Estimated Cost: $ 900

Long Term Improvement:

❑Work with VDOT to remove this parking area and expand the Stone Bridge East parking lot which is on previously disturbed land.

Estimated Cost: $10,000

Total Estimated Cost: $16,100

Site 17 - Stone Bridge - East

Site Description: This site is located east of Bull Run Creek on the north side of US29. The general location of the site is shown in FIGURE 7-1. The site consists of a paved access road and parking area. The pavement condition within the site is poor. The parking area has a rectangular shape with an estimated capacity of 19 vehicles. The access road intersects US29 in a straight and level section of the highway. The posted speed limit on US29 through this site is 55 MPH. The centerline striping prohibits passing on both approaches to the site. The site has several foot trials leading away from the site to the north and west. The site layout and physical features are shown in FIGURE 7-34 and FIGURE 7-35 contains pictures of the site.

Problem:

- There is no advance signing for this site nor is there any signing identifying the location of the access road to the parking area.
- There is no designated parking pattern or traffic control identified at this site.
- The parking area fills to capacity on the weekends.

Recommendations:

❑ Install brown and white advance guidance signs on both approaches of US29. Locate these signs 300 feet from the site access road.

Estimated Cost: $ 700

❑ Install a bi-directional brown and white guidance sign indicating the location of the site. Locate the sign on the south side of US29, directly across from the site access road.

Estimated Cost: $ 700

❑ Install painted lines in the parking area that indicate the desired parking pattern.

Estimated Cost: $ 500

❑ Install a stop sign and painted stop bar on the access road at the intersection.

Estimated Cost: $ 450

Long Term Improvement:

❑ Expand the size of the parking areas so that the lot has a capacity of 40 vehicles and can meet the demands of the current Stone Bridge East and West parking areas. The area has been previously disturbed.

Estimated Cost: $40,000

Total Estimated Cost: $42,350

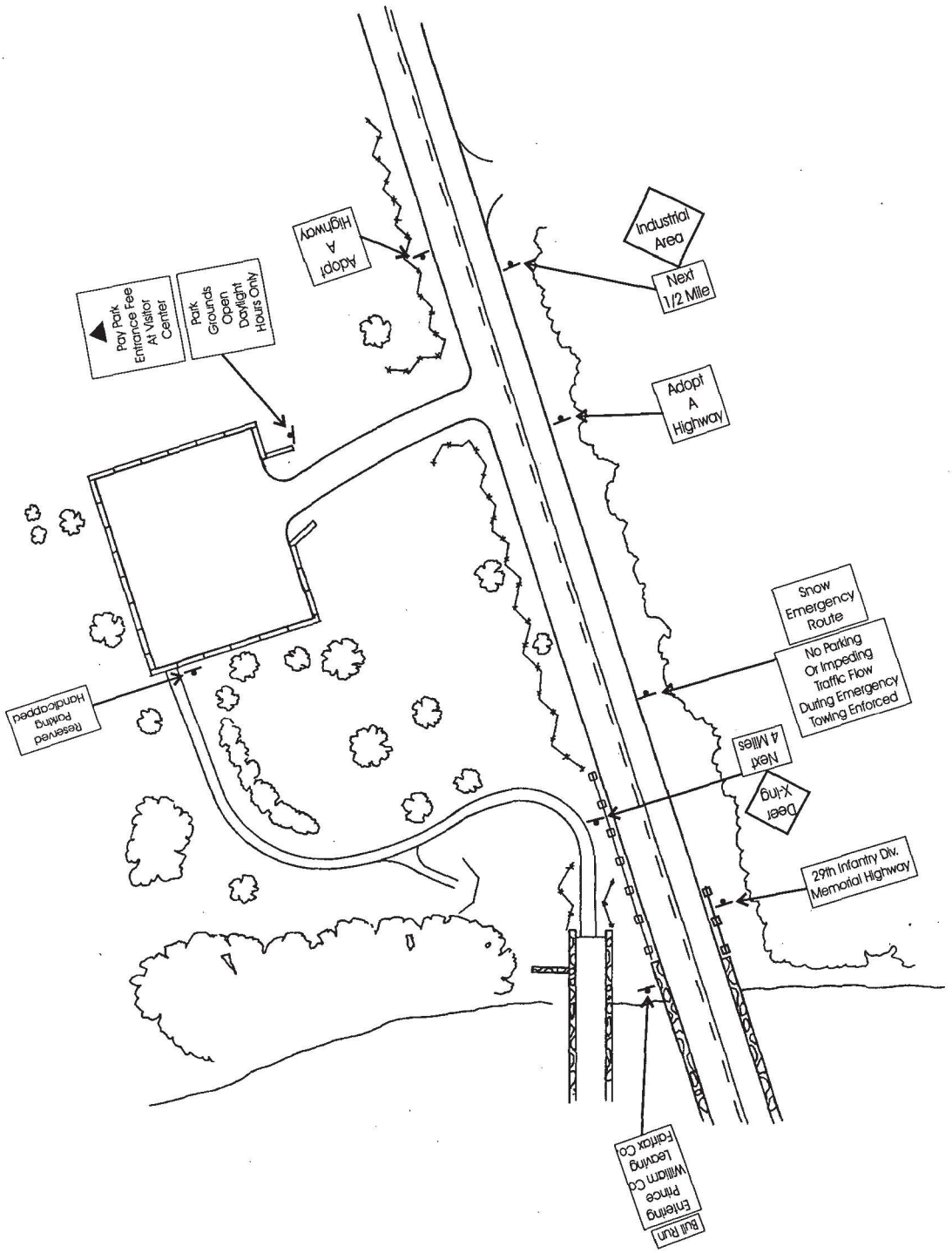


Figure 7-34:
Site 17 - Stone Bridge East

Not To Scale

The Stone Bridge (East) parking area is gravel and has a rectangular shape. The lot can hold about 19 vehicles.

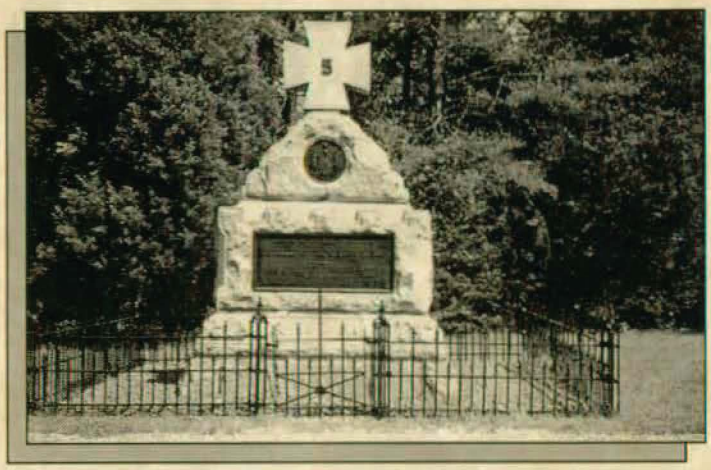
When this parking area fills to capacity visitors park their vehicles on the grass adjacent to the parking lot.

The parking lot is located about 100 feet from US 29. The lot is connected to the highway by a short gravel access road. Notice that there is no traffic control (stop sign) at the junction of the access road and US 29.

This site is located on a straight level section of US 29. This picture was taken facing east with the parking lot access on the left. Sight distance is good on both approaches to the site.

Figure 7-35: Photo Page, Site 17

Appendix A - Traffic Volume Data



Volume Count Report

Generated by MSC3000 Version 2.00 Copyright 1990, 1991 Mitron Systems Corporation

Location ..... US Rte 29 east of VA Rte 234, EB
Location Code ..... Loc 82
County ..... Prince William, VA
Recorder Set 05/19/95 14:42
Recording Start ... 05/19/95 15:00
Recording End 05/27/95 14:30
Sample Time ..... 15 Minutes
Operator Number ... 2
Machine Number 111
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 05/19/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
															396	357	337	260	259	252	215	177	91	2344
															90	80	98	58	54	62	72	42	22	
															102	97	86	61	68	73	63	48	33	
															116	113	84	72	74	71	45	34	17	
															88	67	69	69	63	46	35	53	19	

AM Peak Hour ..... Unavailable
AM Peak Hour Factor ..... Unavailable
PM Peak Hour ..... 15:00 to 16:00 (396 vehicles)
PM Peak Hour Factor 85.3%

Saturday 05/20/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
52	25	14	22	20	120	218	284	314	332	354	408	471	505	474	490	495	448	395	345	275	218	155	112	6546
17	6	5	5	3	15	43	56	65	70	84	102	116	109	112	100	131	111	104	78	74	62	41	20	
11	9	1	6	3	27	64	71	78	91	87	111	95	119	122	139	101	117	93	93	73	72	40	36	
14	3	3	5	7	34	53	74	80	85	96	88	146	136	139	137	118	116	98	96	69	54	51	29	
10	7	5	6	7	44	58	83	91	86	87	107	114	141	101	114	145	104	100	78	59	30	23	27	

AM Peak Hour ..... 11:00 to 12:00 (408 vehicles)
AM Peak Hour Factor 91.9%
PM Peak Hour ..... 15:15 to 16:15 (521 vehicles)
PM Peak Hour Factor 93.7%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	N/A	13:00-	N/A	14:00-	N/A	15:00-	N/A	16:00-	5957
17:00-	6051	18:00-	6189	19:00-	6300	20:00-	6435	21:00-	6521	22:00-	6544	23:00-	6547	24:00-	6525

Sunday 05/21/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
63	29	15	11	14	34	64	112	186	304	316	359	424	479	500	512	575	598	752	534	326	247	93	54	6601
19	8	7	4	5	7	12	22	44	72	65	85	94	97	112	124	132	115	178	150	86	82	32	19	
16	8	4	1	2	9	18	20	39	85	67	96	89	112	136	133	161	156	184	152	94	73	21	18	
12	7	3	2	3	12	16	27	56	76	86	89	125	128	122	118	129	134	190	123	81	50	27	6	
16	6	1	4	4	6	18	43	47	71	98	89	116	142	130	137	153	193	200	109	65	42	13	11	

AM Peak Hour ..... 10:45 to 11:45 (368 vehicles)
AM Peak Hour Factor 93.9%
PM Peak Hour ..... 18:00 to 19:00 (752 vehicles)
PM Peak Hour Factor 94.0%

24-Hour Moving Total

01:00-	6557	02:00-	6561	03:00-	6562	04:00-	6551	05:00-	6545	06:00-	6459	07:00-	6305	08:00-	6133								
09:00-	6005	10:00-	5977	11:00-	5939	12:00-	5890	13:00-	5843	14:00-	5817	15:00-	5843	16:00-	5865								
17:00-	5945	18:00-	6095	19:00-	6452	20:00-	6641	21:00-	6692	22:00-	6721	23:00-	6659	24:00-	6601								

Monday 05/22/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
27	21	19	15	75	843	1487	1575	1591	650	352	373	402	360	353	365	386	349	274	252	249	192	108	56	10374
9	6	3	1	9	70	375	395	387	174	97	119	93	85	104	88	89	101	66	61	69	55	40	20	
7	9	7	4	16	128	394	377	379	202	103	81	111	97	103	86	108	89	59	64	68	59	24	18	
5	4	5	3	18	245	366	390	434	175	67	85	81	93	76	91	94	85	64	66	57	44	26	12	
6	2	4	7	32	400	352	413	391	99	85	88	117	85	70	100	95	74	85	61	55	34	18	6	

AM Peak Hour ..... 07:45 to 08:45 (1613 vehicles)
AM Peak Hour Factor 92.9%
PM Peak Hour ..... 12:00 to 13:00 (402 vehicles)
PM Peak Hour Factor 85.9%

24-Hour Moving Total

01:00-	6565	02:00-	6557	03:00-	6561	04:00-	6565	05:00-	6626	06:00-	7435	07:00-	8858	08:00-	10321								
09:00-	11726	10:00-	12072	11:00-	12108	12:00-	12122	13:00-	12100	14:00-	11981	15:00-	11834	16:00-	11687								
17:00-	11498	18:00-	11249	19:00-	10771	20:00-	10489	21:00-	10412	22:00-	10357	23:00-	10372	24:00-	10374								

Tuesday 05/23/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
25	20	7	16	74	727	1572	1572	1320	584	352	394	442	346	391	341	309	364	295	269	246	228	100	45	10039
10	8	1	3	5	56	397	386	411	179	98	101	117	90	105	101	82	101	81	67	77	80	36	9	
8	5	2	5	11	122	403	367	395	157	89	90	121	77	89	69	88	93	70	68	63	57	24	9	
5	1	2	4	23	250	373	394	282	131	84	107	109	93	107	89	76	83	78	64	47	47	29	17	
2	6	2	4	35	299	399	425	232	117	81	96	95	86	90	82	63	87	66	70	59	44	11	10	

AM Peak Hour ..... 07:30 to 08:30 (1625 vehicles)
AM Peak Hour Factor 95.6%
PM Peak Hour ..... 12:00 to 13:00 (442 vehicles)
PM Peak Hour Factor 91.3%

24-Hour Moving Total

01:00-	10372	02:00-	10371	03:00-	10359	04:00-	10360	05:00-	10359	06:00-	10243	07:00-	10328	08:00-	10325
09:00-	10054	10:00-	9988	11:00-	9988	12:00-	10009	13:00-	10049	14:00-	10035	15:00-	10073	16:00-	10049
17:00-	9972	18:00-	9987	19:00-	10008	20:00-	10025	21:00-	10022	22:00-	10058	23:00-	10050	24:00-	10039

Wednesday 05/24/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
29	12	11	11	65	806	1587	1600	1452	516	321	376	380	55	9	330	339	326	301	226	229	245	128	50	9404
13	5	0	3	9	67	409	379	388	163	74	96	106	52	1	69	80	82	72	51	52	71	44	17	
5	2	0	2	5	112	412	438	425	125	87	80	86	0	3	84	74	85	83	61	62	68	42	15	
5	3	4	2	25	229	388	402	348	135	92	102	94	1	5	85	94	91	64	56	47	64	26	14	
6	2	7	4	26	398	378	381	291	93	68	98	94	2	0	92	91	68	82	58	68	42	16	4	

AM Peak Hour ..... 07:15 to 08:15 (1609 vehicles)
AM Peak Hour Factor 91.8%
PM Peak Hour ..... 12:00 to 13:00 (380 vehicles)
PM Peak Hour Factor 89.6%

24-Hour Moving Total

01:00-	10043	02:00-	10035	03:00-	10039	04:00-	10034	05:00-	10025	06:00-	10104	07:00-	10119	08:00-	10147
09:00-	10279	10:00-	10211	11:00-	10180	12:00-	10162	13:00-	10100	14:00-	9809	15:00-	9427	16:00-	9416
17:00-	9446	18:00-	9408	19:00-	9414	20:00-	9371	21:00-	9354	22:00-	9371	23:00-	9399	24:00-	9404

Thursday 05/25/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
27	10	12	16	70	834	1588	1523	1550	540	364	364	414	392	396	421	392	334	356	264	230	193	114	52	10456
11	4	5	4	5	53	408	351	501	170	97	93	80	112	97	82	108	77	85	76	53	77	23	17	
5	1	4	5	14	131	397	352	444	156	86	67	116	67	82	126	74	93	106	63	61	47	30	14	
5	2	2	2	14	232	384	422	367	123	82	117	105	94	100	117	107	88	98	74	70	42	34	12	
6	3	1	5	37	418	399	398	238	91	99	87	113	119	117	96	103	76	67	51	46	27	27	9	

AM Peak Hour ..... 07:30 to 08:30 (1765 vehicles)
AM Peak Hour Factor 88.1%
PM Peak Hour ..... 15:15 to 16:15 (447 vehicles)
PM Peak Hour Factor 88.7%

24-Hour Moving Total

01:00-	9402	02:00-	9400	03:00-	9401	04:00-	9406	05:00-	9411	06:00-	9439	07:00-	9440	08:00-	9363								
09:00-	9461	10:00-	9485	11:00-	9528	12:00-	9516	13:00-	9550	14:00-	9887	15:00-	10274	16:00-	10365								
17:00-	10418	18:00-	10426	19:00-	10481	20:00-	10519	21:00-	10520	22:00-	10468	23:00-	10454	24:00-	10456								

Friday 05/26/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
24	20	13	16	68	709	1514	1297	938	503	368	303	420	403	377	424	382	373	289	277	226	210	140	80	9374
4	6	1	3	5	56	418	339	289	149	78	66	102	98	86	105	91	100	75	63	49	63	38	29	
2	4	6	2	8	114	376	323	259	134	103	86	124	105	87	116	115	80	62	80	68	54	40	17	
10	7	3	5	14	216	398	306	221	124	81	80	100	109	98	97	94	99	76	76	51	55	34	13	
8	3	3	6	41	323	322	329	169	96	106	71	94	91	106	106	82	94	76	58	58	38	28	21	

AM Peak Hour ..... 05:45 to 06:45 (1515 vehicles)
AM Peak Hour Factor 90.6%
PM Peak Hour ..... 14:30 to 15:30 (425 vehicles)
PM Peak Hour Factor 91.6%

24-Hour Moving Total

01:00-	10453	02:00-	10463	03:00-	10464	04:00-	10464	05:00-	10462	06:00-	10337	07:00-	10263	08:00-	10037								
09:00-	9425	10:00-	9388	11:00-	9392	12:00-	9331	13:00-	9337	14:00-	9348	15:00-	9329	16:00-	9332								
17:00-	9322	18:00-	9361	19:00-	9294	20:00-	9307	21:00-	9303	22:00-	9320	23:00-	9346	24:00-	9374								

Volume Count Report

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Location ..... US Rte 29 east of VA Rte 234, WB
Location Code ..... Loc 84
County ..... Prince William, VA
Recorder Set 05/19/95 14:45
Recording Start ... 05/19/95 15:00
Recording End 05/27/95 14:30
Sample Time ..... 15 Minutes
Operator Number ... 2
Machine Number 76
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 05/19/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
															956	1136	1142	1030	665	379	274	263	150	5995
															196	260	294	286	201	115	83	80	52	
															227	276	283	274	169	114	66	67	36	
															240	273	290	261	161	75	66	64	34	
															293	327	275	209	134	75	59	52	28	

AM Peak Hour ..... Unavailable
AM Peak Hour Factor ..... Unavailable
PM Peak Hour ..... 16:45 to 17:45 (1194 vehicles)
PM Peak Hour Factor 91.3%

Saturday 05/20/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
106	47	45	21	32	44	130	282	378	528	691	700	693	656	635	594	553	488	462	349	283	226	166	123	8232
33	14	16	4	9	5	21	73	73	130	158	153	164	172	149	146	146	116	106	100	77	69	45	34	
24	10	6	9	11	10	33	64	82	142	138	198	182	158	182	155	141	119	129	72	69	45	37	30	
29	7	15	3	4	14	28	77	111	123	159	178	182	161	152	144	126	121	114	88	66	58	48	25	
20	16	8	5	8	15	48	68	112	133	236	171	165	165	152	149	140	132	113	89	71	54	36	34	

AM Peak Hour ..... 10:45 to 11:45 (765 vehicles)
AM Peak Hour Factor 81.0%
PM Peak Hour ..... 12:15 to 13:15 (701 vehicles)
PM Peak Hour Factor 96.3%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	N/A	13:00-	N/A	14:00-	N/A	15:00-	N/A	16:00-	10983
17:00-	10621	18:00-	10038	19:00-	9384	20:00-	8816	21:00-	8500	22:00-	8404	23:00-	8356	24:00-	8259

Sunday 05/21/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
113	61	39	27	15	35	114	212	284	336	446	556	645	621	565	564	456	430	365	272	220	174	104	71	6725
36	14	11	10	3	5	16	54	56	66	106	161	142	153	164	162	134	108	90	58	58	43	30	18	
26	13	7	6	5	8	20	55	76	85	115	128	184	164	140	140	111	113	90	83	60	44	23	26	
27	16	8	5	2	8	39	53	66	87	119	119	179	148	139	132	106	96	103	60	54	47	30	15	
24	18	13	6	5	14	39	50	86	98	106	148	140	156	122	130	105	113	82	71	48	40	21	12	

AM Peak Hour ..... 11:00 to 12:00 (556 vehicles)
AM Peak Hour Factor 86.3%
PM Peak Hour ..... 12:15 to 13:15 (656 vehicles)
PM Peak Hour Factor 89.1%

24-Hour Moving Total

01:00-	8239	02:00-	8253	03:00-	8247	04:00-	8253	05:00-	8236	06:00-	8227	07:00-	8211	08:00-	8141
09:00-	8047	10:00-	7855	11:00-	7610	12:00-	7466	13:00-	7418	14:00-	7383	15:00-	7313	16:00-	7283
17:00-	7186	18:00-	7128	19:00-	7031	20:00-	6954	21:00-	6891	22:00-	6839	23:00-	6777	24:00-	6725

Monday 05/22/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
40	21	16	11	10	68	116	327	429	556	644	747	728	928	1018	1454	1620	1450	1013	518	287	240	128	74	12443
18	7	4	3	1	5	23	75	96	128	154	182	154	248	189	304	455	357	297	150	83	70	36	25	
12	8	9	3	2	13	20	82	121	123	145	172	135	261	225	334	415	405	292	146	60	71	46	21	
5	1	1	3	7	23	38	75	124	165	177	196	221	196	358	451	392	395	246	107	89	56	24	19	
5	5	2	2	0	27	35	95	88	140	168	197	218	223	246	365	358	293	178	115	55	43	22	9	

AM Peak Hour ..... 11:00 to 12:00 (747 vehicles)
AM Peak Hour Factor 94.8%
PM Peak Hour ..... 15:30 to 16:30 (1686 vehicles)
PM Peak Hour Factor 92.6%

24-Hour Moving Total

01:00-	6652	02:00-	6612	03:00-	6589	04:00-	6573	05:00-	6568	06:00-	6601	07:00-	6603	08:00-	6718
09:00-	6863	10:00-	7083	11:00-	7281	12:00-	7472	13:00-	7555	14:00-	7862	15:00-	8315	16:00-	9205
17:00-	10369	18:00-	11389	19:00-	12037	20:00-	12283	21:00-	12350	22:00-	12416	23:00-	12440	24:00-	12443

Tuesday 05/23/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
28	19	24	11	25	82	141	312	370	390	423	485	641	813	902	1314	1654	1419	1139	565	346	298	178	105	11684
14	6	5	4	5	12	24	47	72	115	102	127	132	192	212	303	455	325	348	158	99	77	57	34	
9	5	6	2	9	14	35	92	79	75	109	125	137	240	196	305	452	357	320	154	102	94	49	21	
3	2	4	1	4	24	38	84	109	107	113	128	171	207	214	340	382	394	270	133	73	60	36	22	
2	6	9	4	7	32	44	89	110	93	99	105	201	174	280	366	365	343	201	120	72	67	36	28	

AM Peak Hour ..... 11:00 to 12:00 (485 vehicles)
AM Peak Hour Factor 94.7%
PM Peak Hour ..... 15:45 to 16:45 (1655 vehicles)
PM Peak Hour Factor 90.9%

24-Hour Moving Total

01:00- 12431	02:00- 12429	03:00- 12437	04:00- 12437	05:00- 12452	06:00- 12466	07:00- 12491	08:00- 12476
09:00- 12417	10:00- 12251	11:00- 12030	12:00- 11768	13:00- 11681	14:00- 11566	15:00- 11450	16:00- 11310
17:00- 11344	18:00- 11313	19:00- 11439	20:00- 11486	21:00- 11545	22:00- 11603	23:00- 11653	24:00- 11684

Wednesday 05/24/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
56	36	19	14	14	73	142	265	328	359	531	565	606	612	794	1230	1416	1377	1171	548	394	270	199	134	11153
22	9	7	5	4	12	31	44	81	84	112	123	152	130	168	218	327	327	339	161	105	83	51	36	
15	7	4	1	5	8	31	60	89	97	136	156	121	181	194	290	372	334	344	141	117	59	57	34	
8	8	2	3	3	21	46	73	66	84	128	139	156	156	196	373	356	372	299	134	81	64	47	33	
11	12	6	5	2	32	34	88	92	94	155	147	177	145	236	349	361	344	189	112	91	64	44	31	

AM Peak Hour ..... 10:45 to 11:45 (573 vehicles)
AM Peak Hour Factor 91.8%
PM Peak Hour ..... 15:30 to 16:30 (1421 vehicles)
PM Peak Hour Factor 95.2%

24-Hour Moving Total

01:00- 11712	02:00- 11729	03:00- 11724	04:00- 11727	05:00- 11716	06:00- 11707	07:00- 11708	08:00- 11661
09:00- 11619	10:00- 11588	11:00- 11696	12:00- 11776	13:00- 11741	14:00- 11540	15:00- 11432	16:00- 11348
17:00- 11110	18:00- 11068	19:00- 11100	20:00- 11083	21:00- 11131	22:00- 11103	23:00- 11124	24:00- 11153

Thursday 05/25/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
70	33	15	8	14	63	175	280	395	381	418	473	549	533	634	949	1313	1222	1155	627	335	236	182	118	10178
37	13	6	3	5	8	41	63	92	96	93	118	168	127	163	226	329	316	272	204	96	50	50	34	
15	7	2	0	3	7	45	75	107	92	110	118	111	131	174	202	313	320	285	147	117	90	52	32	
8	8	2	1	1	16	44	63	92	78	108	103	149	147	169	262	357	294	305	152	58	46	40	31	
10	5	5	4	5	32	45	79	104	115	107	134	121	128	128	259	314	292	293	124	64	50	40	21	

AM Peak Hour ..... 11:00 to 12:00 (473 vehicles)
AM Peak Hour Factor 88.2%
PM Peak Hour ..... 16:00 to 17:00 (1313 vehicles)
PM Peak Hour Factor 91.9%

24-Hour Moving Total

01:00- 11167	02:00- 11164	03:00- 11160	04:00- 11154	05:00- 11154	06:00- 11144	07:00- 11177	08:00- 11192
09:00- 11259	10:00- 11281	11:00- 11168	12:00- 11076	13:00- 11019	14:00- 10940	15:00- 10780	16:00- 10499
17:00- 10396	18:00- 10241	19:00- 10225	20:00- 10304	21:00- 10245	22:00- 10211	23:00- 10194	24:00- 10178

Friday 05/26/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
65	39	15	20	20	83	152	282	378	404	424	533	595	700	826	1169	1342	1339	936	573	409	226	234	135	10899
27	11	6	8	5	13	25	61	83	103	87	133	119	185	191	260	329	322	283	174	117	62	60	47	
21	7	4	2	4	14	38	70	78	100	101	123	146	188	166	315	355	346	230	143	100	58	63	41	
12	13	3	3	7	24	40	75	119	99	128	128	137	179	239	302	325	346	218	142	96	56	58	28	
5	8	2	7	4	32	49	76	98	102	108	149	193	148	230	292	333	325	205	114	96	50	53	19	

AM Peak Hour ..... 11:00 to 12:00 (533 vehicles)
AM Peak Hour Factor 89.4%
PM Peak Hour ..... 16:45 to 17:45 (1347 vehicles)
PM Peak Hour Factor 97.3%

24-Hour Moving Total

01:00- 10173	02:00- 10179	03:00- 10179	04:00- 10191	05:00- 10197	06:00- 10217	07:00- 10194	08:00- 10196
09:00- 10179	10:00- 10202	11:00- 10208	12:00- 10268	13:00- 10314	14:00- 10481	15:00- 10673	16:00- 10893
17:00- 10922	18:00- 11039	19:00- 10820	20:00- 10766	21:00- 10840	22:00- 10830	23:00- 10882	24:00- 10899

Volume Count Report

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Location ..... VA Rte 234 S. of US Rte 29, Northbound
Location Code ..... Loc 21
County ..... Prince William, VA
Recorder Set 05/19/95 10:42
Recording Start ... 05/19/95 11:00
Recording End 05/27/95 12:00
Sample Time ..... 15 Minutes
Operator Number ... 2
Machine Number 35
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 05/19/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
											362	484	376	504	552	524	515	358	422	370	358	279	129	5233
											95	109	81	117	141	131	119	78	91	80	98	76	22	
											78	131	99	167	149	121	148	85	108	114	82	79	46	
											88	116	104	111	125	161	143	101	128	94	77	64	27	
											101	128	92	109	137	111	105	94	95	82	101	60	34	

AM Peak Hour ..... 11:00 to 12:00 (362 vehicles)
AM Peak Hour Factor 89.6%
PM Peak Hour ..... 15:00 to 16:00 (552 vehicles)
PM Peak Hour Factor 92.6%

Saturday 05/20/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
89	46	39	14	22	62	173	204	237	344	425	528	557	636	611	609	504	475	464	390	342	292	218	137	7418
24	9	10	3	5	7	41	39	56	66	99	126	145	154	146	141	98	141	124	93	94	72	58	30	
24	12	10	8	3	14	49	50	61	85	122	138	143	176	167	154	132	98	114	89	84	78	56	41	
19	8	3	1	8	16	38	56	55	96	104	111	127	160	183	156	126	133	107	106	83	80	64	34	
22	17	16	2	6	25	45	59	65	97	100	153	142	146	115	158	148	103	119	102	81	62	40	32	

AM Peak Hour ..... 11:00 to 12:00 (528 vehicles)
AM Peak Hour Factor 86.3%
PM Peak Hour ..... 13:45 to 14:45 (642 vehicles)
PM Peak Hour Factor 87.7%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	6888	13:00-	7054	14:00-	7127	15:00-	7387	16:00-	7494
17:00-	7551	18:00-	7531	19:00-	7491	20:00-	7597	21:00-	7565	22:00-	7537	23:00-	7471	24:00-	7410

Sunday 05/21/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
122	76	35	27	48	35	61	106	174	265	428	492	544	599	566	551	454	503	638	404	241	176	97	54	6696
34	22	12	6	12	9	19	17	38	56	101	121	119	156	135	143	125	107	165	129	68	45	29	17	
26	13	10	6	7	8	14	26	38	63	90	110	125	128	157	126	116	124	142	91	67	50	17	16	
28	26	7	7	16	3	14	28	42	73	113	123	162	148	149	139	105	99	155	105	57	46	30	12	
34	15	6	8	13	15	14	35	56	73	124	138	138	167	125	143	108	173	176	79	49	35	21	9	

AM Peak Hour ..... 11:00 to 12:00 (492 vehicles)
AM Peak Hour Factor 89.1%
PM Peak Hour ..... 18:00 to 19:00 (638 vehicles)
PM Peak Hour Factor 90.6%

24-Hour Moving Total

01:00-	7451	02:00-	7481	03:00-	7477	04:00-	7490	05:00-	7516	06:00-	7489	07:00-	7377	08:00-	7279								
09:00-	7216	10:00-	7137	11:00-	7140	12:00-	7104	13:00-	7091	14:00-	7054	15:00-	7009	16:00-	6951								
17:00-	6901	18:00-	6929	19:00-	7103	20:00-	7117	21:00-	7016	22:00-	6900	23:00-	6779	24:00-	6696								

Monday 05/22/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
31	21	34	10	27	373	628	652	719	498	336	372	462	417	453	474	524	542	439	361	370	322	154	91	8310
14	7	11	1	1	23	161	185	149	103	77	105	117	109	118	102	128	153	111	86	97	82	56	38	
5	4	12	5	6	39	172	129	142	160	93	94	123	111	125	130	142	106	109	86	93	98	38	19	
4	4	4	1	8	106	165	152	202	147	77	90	107	92	108	117	124	148	124	98	103	80	41	20	
8	6	7	3	12	205	130	186	226	88	89	83	115	105	102	125	130	135	95	91	77	62	19	14	

AM Peak Hour ..... 08:00 to 09:00 (719 vehicles)
AM Peak Hour Factor 79.5%
PM Peak Hour ..... 16:15 to 17:15 (549 vehicles)
PM Peak Hour Factor 89.7%

24-Hour Moving Total

01:00-	6605	02:00-	6550	03:00-	6549	04:00-	6532	05:00-	6511	06:00-	6849	07:00-	7416	08:00-	7962								
09:00-	8507	10:00-	8740	11:00-	8648	12:00-	8528	13:00-	8446	14:00-	8264	15:00-	8151	16:00-	8074								
17:00-	8144	18:00-	8183	19:00-	7984	20:00-	7941	21:00-	8070	22:00-	8216	23:00-	8273	24:00-	8310								

Tuesday 05/23/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
42	18	14	11	20	352	703	595	625	365	354	404	478	456	462	458	423	560	481	399	374	351	164	75	8184
13	8	3	2	5	22	169	125	175	85	93	113	141	108	133	111	106	150	142	85	100	118	52	23	
6	4	3	3	5	37	153	139	188	89	80	93	130	109	107	118	88	122	116	118	85	84	40	21	
14	2	3	3	4	109	188	151	149	106	95	103	107	124	114	118	124	142	104	109	92	77	50	16	
9	4	5	3	6	184	193	180	113	85	86	95	100	115	108	111	105	146	119	87	97	72	22	15	

AM Peak Hour ..... 06:00 to 07:00 (703 vehicles)
AM Peak Hour Factor 91.1%
PM Peak Hour ..... 17:00 to 18:00 (560 vehicles)
PM Peak Hour Factor 93.3%

24-Hour Moving Total

01:00-	8321	02:00-	8318	03:00-	8298	04:00-	8299	05:00-	8292	06:00-	8271	07:00-	8346	08:00-	8289
09:00-	8195	10:00-	8062	11:00-	8080	12:00-	8112	13:00-	8128	14:00-	8167	15:00-	8176	16:00-	8160
17:00-	8059	18:00-	8077	19:00-	8119	20:00-	8157	21:00-	8161	22:00-	8190	23:00-	8200	24:00-	8184

Wednesday 05/24/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
41	23	8	8	22	297	734	675	700	337	320	423	421	428	516	457	427	496	471	358	353	377	219	88	8199
13	9	1	2	3	17	196	175	192	82	70	118	122	110	129	101	112	131	134	88	78	87	62	28	
12	4	1	3	5	39	198	143	182	98	88	110	92	107	133	108	98	126	113	98	94	115	69	28	
9	7	4	1	5	105	174	175	199	84	98	96	111	116	134	134	111	128	111	84	81	91	49	24	
7	3	2	2	9	136	166	182	127	73	64	99	96	95	120	114	106	111	113	88	100	84	39	8	

AM Peak Hour ..... 07:45 to 08:45 (755 vehicles)
AM Peak Hour Factor 94.8%
PM Peak Hour ..... 14:00 to 15:00 (516 vehicles)
PM Peak Hour Factor 96.3%

24-Hour Moving Total

01:00-	8183	02:00-	8188	03:00-	8182	04:00-	8179	05:00-	8181	06:00-	8126	07:00-	8157	08:00-	8237
09:00-	8312	10:00-	8284	11:00-	8250	12:00-	8269	13:00-	8212	14:00-	8184	15:00-	8238	16:00-	8237
17:00-	8241	18:00-	8177	19:00-	8167	20:00-	8126	21:00-	8105	22:00-	8131	23:00-	8186	24:00-	8199

Thursday 05/25/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
61	24	12	15	34	345	727	637	660	351	354	398	476	472	481	465	500	469	482	388	345	328	159	91	8274
24	9	5	2	3	14	215	151	179	100	84	89	108	114	117	115	115	107	142	102	83	123	46	33	
16	7	2	4	12	44	179	127	206	107	81	106	138	118	109	118	127	138	140	81	97	80	43	19	
13	5	1	7	7	94	165	158	165	81	68	98	104	103	123	121	121	112	105	105	85	78	45	24	
8	3	4	2	12	193	168	201	110	63	121	105	126	137	132	111	137	112	95	100	80	47	25	15	

AM Peak Hour ..... 05:45 to 06:45 (752 vehicles)
AM Peak Hour Factor 87.4%
PM Peak Hour ..... 17:30 to 18:30 (506 vehicles)
PM Peak Hour Factor 89.1%

24-Hour Moving Total

01:00-	8219	02:00-	8220	03:00-	8224	04:00-	8231	05:00-	8243	06:00-	8291	07:00-	8284	08:00-	8246
09:00-	8206	10:00-	8220	11:00-	8254	12:00-	8229	13:00-	8284	14:00-	8328	15:00-	8293	16:00-	8301
17:00-	8374	18:00-	8347	19:00-	8358	20:00-	8388	21:00-	8380	22:00-	8331	23:00-	8271	24:00-	8274

Friday 05/26/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
38	28	14	9	24	291	620	619	497	355	338	411	459	487	494	526	554	506	395	398	387	344	232	153	8179
16	6	3	2	5	24	145	159	122	98	69	94	130	118	103	121	153	109	128	92	101	103	58	56	
6	6	5	3	3	45	162	163	124	95	111	107	118	105	140	154	135	139	90	113	95	91	72	33	
11	9	3	1	5	82	191	137	144	88	77	107	98	135	137	137	133	128	91	102	99	74	59	30	
5	7	3	3	11	140	122	160	107	74	81	103	113	129	114	114	133	130	86	91	92	76	43	34	

AM Peak Hour ..... 05:45 to 06:45 (638 vehicles)
AM Peak Hour Factor 83.5%
PM Peak Hour ..... 15:15 to 16:15 (558 vehicles)
PM Peak Hour Factor 90.6%

24-Hour Moving Total

01:00-	8251	02:00-	8255	03:00-	8257	04:00-	8251	05:00-	8241	06:00-	8187	07:00-	8080	08:00-	8062
09:00-	7899	10:00-	7903	11:00-	7887	12:00-	7900	13:00-	7883	14:00-	7898	15:00-	7911	16:00-	7972
17:00-	8026	18:00-	8063	19:00-	7976	20:00-	7986	21:00-	8028	22:00-	8044	23:00-	8117	24:00-	8179

Volume Count Report

Generated by MSC3000 Version 2.00 Copyright 1990, 1991 Mitron Systems Corporation

Location ..... VA Rte 234 S. of US Rte 29, Southbound
Location Code ..... Loc 23
County ..... Prince William, VA
Recorder Set 05/19/95 10:46
Recording Start ... 05/19/95 11:00
Recording End 05/27/95 12:00
Sample Time ..... 15 Minutes
Operator Number ... 2
Machine Number 5
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 05/19/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
											421	510	461	502	590	773	865	776	573	339	224	163	133	6330
											87	131	119	131	130	181	204	219	167	92	58	38	47	
											109	127	116	107	133	198	211	201	141	96	72	44	39	
											96	137	126	128	158	195	218	212	140	85	54	43	23	
											129	115	100	136	169	199	232	144	125	66	40	38	24	

AM Peak Hour ..... 11:00 to 12:00 (421 vehicles)
AM Peak Hour Factor 81.6%
PM Peak Hour ..... 17:15 to 18:15 (880 vehicles)
PM Peak Hour Factor 94.8%

Saturday 05/20/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
77	36	32	13	20	31	136	191	291	441	467	360	398	468	548	429	400	403	363	427	350	232	169	154	6436
21	6	15	2	2	2	31	48	65	116	121	91	106	95	139	121	125	99	82	114	101	77	36	46	
20	12	2	2	5	4	39	42	69	113	96	85	122	93	144	114	96	97	94	106	75	58	48	41	
26	5	10	1	5	13	34	43	69	119	111	97	96	142	125	96	84	118	86	110	83	52	36	32	
10	13	5	8	8	12	32	58	88	93	139	87	74	138	140	98	95	89	101	97	91	45	49	35	

AM Peak Hour ..... 10:00 to 11:00 (467 vehicles)
AM Peak Hour Factor 84.0%
PM Peak Hour ..... 13:30 to 14:30 (563 vehicles)
PM Peak Hour Factor 97.7%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	8065	13:00-	8004	14:00-	7892	15:00-	7899	16:00-	7945
17:00-	7784	18:00-	7411	19:00-	6949	20:00-	6536	21:00-	6390	22:00-	6401	23:00-	6409	24:00-	6415

Sunday 05/21/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
116	78	43	24	31	30	42	116	198	306	394	468	593	544	594	589	541	445	404	322	254	155	94	51	6432
40	17	9	9	17	11	4	27	32	59	91	110	141	150	172	141	132	114	87	75	68	44	34	15	
22	20	21	6	5	6	13	31	49	80	104	127	152	117	131	146	144	118	123	98	66	47	25	15	
22	18	7	4	5	5	13	22	50	80	94	105	164	134	144	161	136	120	102	70	68	34	20	13	
32	23	6	5	4	8	12	36	67	87	105	126	136	143	147	141	129	93	92	79	52	30	15	8	

AM Peak Hour ..... 11:00 to 12:00 (468 vehicles)
AM Peak Hour Factor 92.1%
PM Peak Hour ..... 12:15 to 13:15 (602 vehicles)
PM Peak Hour Factor 91.8%

24-Hour Moving Total

01:00-	6475	02:00-	6517	03:00-	6528	04:00-	6539	05:00-	6550	06:00-	6549	07:00-	6455	08:00-	6380
09:00-	6287	10:00-	6152	11:00-	6079	12:00-	6187	13:00-	6382	14:00-	6458	15:00-	6504	16:00-	6664
17:00-	6805	18:00-	6847	19:00-	6888	20:00-	6783	21:00-	6687	22:00-	6610	23:00-	6535	24:00-	6432

Monday 05/22/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
31	15	18	11	24	109	202	343	353	257	290	308	407	419	450	527	773	886	815	458	286	183	117	72	7354
10	9	4	2	3	11	40	100	82	73	66	65	96	118	107	109	179	198	220	138	80	56	36	24	
9	4	5	2	8	28	40	74	75	54	76	73	96	98	112	130	177	220	212	116	76	43	38	26	
8	0	3	4	6	35	58	71	93	70	76	70	107	110	123	145	206	227	208	109	69	39	24	9	
4	2	6	3	7	35	64	98	103	60	72	100	108	93	108	143	211	241	175	95	61	45	19	13	

AM Peak Hour ..... 08:00 to 09:00 (353 vehicles)
AM Peak Hour Factor 85.7%
PM Peak Hour ..... 17:15 to 18:15 (908 vehicles)
PM Peak Hour Factor 94.2%

24-Hour Moving Total

01:00-	6347	02:00-	6284	03:00-	6259	04:00-	6246	05:00-	6239	06:00-	6318	07:00-	6478	08:00-	6705
09:00-	6860	10:00-	6811	11:00-	6707	12:00-	6547	13:00-	6361	14:00-	6236	15:00-	6092	16:00-	6030
17:00-	6262	18:00-	6703	19:00-	7114	20:00-	7250	21:00-	7282	22:00-	7310	23:00-	7333	24:00-	7354

Tuesday 05/23/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
33	11	10	8	17	105	169	334	464	373	342	409	417	394	442	530	759	917	862	461	306	203	112	66	7744
13	3	1	1	4	10	35	68	98	116	82	97	92	101	97	124	156	189	250	118	87	50	33	21	
9	2	3	1	5	33	36	87	105	81	96	94	102	120	104	117	210	236	231	128	80	54	31	13	
3	3	4	4	2	27	51	74	101	82	73	116	113	93	107	124	205	221	203	108	72	55	26	12	
8	3	2	2	6	35	47	105	160	94	91	102	110	80	134	165	188	271	178	107	67	44	22	20	

AM Peak Hour ..... 08:15 to 09:15 (482 vehicles)
AM Peak Hour Factor 75.3%
PM Peak Hour ..... 17:15 to 18:15 (978 vehicles)
PM Peak Hour Factor 90.2%

24-Hour Moving Total

01:00-	7356	02:00-	7352	03:00-	7344	04:00-	7341	05:00-	7334	06:00-	7330	07:00-	7297	08:00-	7288
09:00-	7399	10:00-	7515	11:00-	7567	12:00-	7668	13:00-	7678	14:00-	7653	15:00-	7645	16:00-	7648
17:00-	7634	18:00-	7665	19:00-	7712	20:00-	7715	21:00-	7735	22:00-	7755	23:00-	7750	24:00-	7744

Wednesday 05/24/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
34	12	7	7	16	93	204	322	457	358	393	390	407	429	445	595	771	807	815	444	274	178	96	54	7608
13	2	4	2	3	16	39	80	96	101	108	102	104	81	102	118	183	193	241	140	78	57	24	21	
9	2	1	4	3	24	48	84	106	87	98	88	84	121	122	141	179	194	214	98	77	51	30	13	
6	4	2	1	5	24	56	73	128	86	86	89	111	122	106	156	196	197	198	114	66	38	24	10	
6	4	0	0	5	29	61	85	127	84	101	111	108	105	115	180	213	223	162	92	53	32	18	10	

AM Peak Hour ..... 08:15 to 09:15 (462 vehicles)
AM Peak Hour Factor 90.2%
PM Peak Hour ..... 17:45 to 18:45 (876 vehicles)
PM Peak Hour Factor 90.9%

24-Hour Moving Total

01:00-	7745	02:00-	7746	03:00-	7743	04:00-	7742	05:00-	7741	06:00-	7729	07:00-	7764	08:00-	7752
09:00-	7745	10:00-	7730	11:00-	7781	12:00-	7762	13:00-	7752	14:00-	7787	15:00-	7790	16:00-	7855
17:00-	7867	18:00-	7757	19:00-	7710	20:00-	7693	21:00-	7661	22:00-	7636	23:00-	7620	24:00-	7608

Thursday 05/25/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
32	12	10	5	15	77	192	298	423	363	366	390	416	422	472	612	656	751	622	320	180	111	84	39	6868
11	2	2	1	1	9	39	69	72	87	85	95	114	85	97	111	173	195	166	123	45	28	27	13	
12	5	1	1	3	19	41	67	99	89	78	92	82	95	124	146	163	175	181	67	59	43	28	9	
5	5	5	2	6	23	48	68	108	88	97	98	112	119	125	160	143	191	156	76	36	22	15	9	
4	0	2	1	5	26	64	94	144	99	106	105	108	123	126	195	177	190	119	54	40	18	14	8	

AM Peak Hour ..... 08:15 to 09:15 (438 vehicles)
AM Peak Hour Factor 76.0%
PM Peak Hour ..... 17:00 to 18:00 (751 vehicles)
PM Peak Hour Factor 96.3%

24-Hour Moving Total

01:00-	7606	02:00-	7606	03:00-	7609	04:00-	7607	05:00-	7606	06:00-	7590	07:00-	7578	08:00-	7554
09:00-	7520	10:00-	7525	11:00-	7498	12:00-	7498	13:00-	7507	14:00-	7500	15:00-	7527	16:00-	7544
17:00-	7429	18:00-	7373	19:00-	7180	20:00-	7056	21:00-	6962	22:00-	6895	23:00-	6883	24:00-	6868

Friday 05/26/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
26	16	4	5	18	76	173	314	400	412	333	429	516	476	517	608	796	889	803	590	354	230	164	117	8266
7	6	0	3	2	5	32	75	75	124	81	97	133	120	110	137	186	207	218	172	89	74	45	41	
8	4	1	0	8	22	42	61	89	111	76	112	129	123	135	134	204	226	226	145	99	60	44	29	
6	4	1	1	4	21	48	81	101	82	84	89	135	103	132	174	205	217	207	144	95	56	39	26	
5	2	2	1	4	28	51	97	135	95	92	131	119	130	140	163	201	239	152	129	71	40	36	21	

AM Peak Hour ..... 08:30 to 09:30 (471 vehicles)
AM Peak Hour Factor 87.2%
PM Peak Hour ..... 17:15 to 18:15 (900 vehicles)
PM Peak Hour Factor 94.1%

24-Hour Moving Total

01:00-	6862	02:00-	6866	03:00-	6860	04:00-	6860	05:00-	6863	06:00-	6862	07:00-	6843	08:00-	6859
09:00-	6836	10:00-	6885	11:00-	6852	12:00-	6891	13:00-	6991	14:00-	7045	15:00-	7090	16:00-	7086
17:00-	7226	18:00-	7364	19:00-	7545	20:00-	7815	21:00-	7989	22:00-	8108	23:00-	8188	24:00-	8266

Volume Count Report

Generated by MSC3000 Version 2.00 Copyright 1990, 1991 Mitron Systems Corporation

Location ..... US RTE. 29 E. OF RTE. 234, EASTBOUND
Location Code ..... LOC 42 EB
County ..... PRINCE WILLIAM, VA
Recorder Set 07/07/95 12:17
Recording Start ... 07/07/95 13:00
Recording End 07/17/95 11:30
Sample Time ..... 15 Minutes
Operator Number ... 9
Machine Number 28
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 07/07/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
													386	424	413	440	394	362	235	227	201	111	80	3273
													83	101	108	114	109	93	80	55	50	36	33	
													89	99	82	113	92	86	54	64	69	31	18	
													108	108	102	105	99	95	52	52	50	26	16	
													106	116	121	108	94	88	49	56	32	18	13	

AM Peak Hour ..... Unavailable
AM Peak Hour Factor ..... Unavailable
PM Peak Hour ..... 15:45 to 16:45 (453 vehicles)
PM Peak Hour Factor 93.6%

Saturday 07/08/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
49	27	25	19	71	212	399	260	247	413	509	494	348	294	286	370	320	202	240	176	161	134	100	72	5428
15	7	5	5	17	34	98	86	42	105	110	157	103	93	59	103	99	66	64	44	38	28	34	21	
10	5	5	2	17	38	115	57	29	85	160	111	79	76	76	100	64	49	60	41	46	33	29	17	
12	5	5	7	20	55	76	68	108	110	125	135	81	59	76	86	103	44	61	51	42	36	19	18	
12	10	10	5	17	85	110	49	68	113	114	91	85	66	75	81	54	43	55	40	35	37	18	16	

AM Peak Hour ..... 10:15 to 11:15 (556 vehicles)
AM Peak Hour Factor 86.9%
PM Peak Hour ..... 15:00 to 16:00 (370 vehicles)
PM Peak Hour Factor 89.8%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	N/A	13:00-	N/A	14:00-	6346	15:00-	6254	16:00-	6116
17:00-	6073	18:00-	5953	19:00-	5761	20:00-	5639	21:00-	5580	22:00-	5514	23:00-	5447	24:00-	5436

Sunday 07/09/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
60	44	34	21	9	27	101	130	223	341	430	1916	619	555	595	449	360	226	218	141	141	82	130	54	6906
18	12	9	7	2	4	16	35	38	86	99	1476	128	132	156	124	115	54	61	28	35	19	44	14	
14	10	9	8	3	4	23	37	54	84	106	162	168	165	142	109	95	50	48	37	43	22	28	10	
13	8	6	4	2	8	38	44	57	80	87	143	174	130	165	111	84	59	57	40	28	24	36	11	
15	14	10	2	2	11	24	14	74	91	138	135	149	128	132	105	66	63	52	36	35	17	22	19	

AM Peak Hour ..... 10:45 to 11:45 (1919 vehicles)
AM Peak Hour Factor 32.5%
PM Peak Hour ..... 12:15 to 13:15 (623 vehicles)
PM Peak Hour Factor 89.5%

24-Hour Moving Total

01:00-	5439	02:00-	5456	03:00-	5465	04:00-	5467	05:00-	5405	06:00-	5220	07:00-	4922	08:00-	4792
09:00-	4768	10:00-	4696	11:00-	4617	12:00-	6039	13:00-	6310	14:00-	6571	15:00-	6880	16:00-	6959
17:00-	6999	18:00-	7023	19:00-	7001	20:00-	6966	21:00-	6946	22:00-	6894	23:00-	6924	24:00-	6906

Monday 07/10/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
19	8	11	19	28	520	1079	1164	1099	532	320	366	351	340	345	334	345	359	329	225	221	183	89	38	8324
9	2	3	2	2	56	261	284	295	156	84	106	81	74	104	85	86	104	88	60	64	64	24	9	
3	3	2	8	4	71	274	294	294	168	77	73	90	76	89	88	83	90	94	65	55	53	25	10	
4	2	3	3	12	132	260	280	246	109	85	94	94	89	68	81	99	80	78	52	58	39	22	11	
3	1	3	6	10	261	284	306	264	99	74	93	86	101	84	80	77	85	69	48	44	27	18	8	

AM Peak Hour ..... 07:15 to 08:15 (1175 vehicles)
AM Peak Hour Factor 96.0%
PM Peak Hour ..... 13:30 to 14:30 (383 vehicles)
PM Peak Hour Factor 92.1%

24-Hour Moving Total

01:00-	6865	02:00-	6829	03:00-	6806	04:00-	6804	05:00-	6823	06:00-	7316	07:00-	8294	08:00-	9328
09:00-	10204	10:00-	10395	11:00-	10285	12:00-	8735	13:00-	8467	14:00-	8252	15:00-	8002	16:00-	7887
17:00-	7872	18:00-	8005	19:00-	8116	20:00-	8200	21:00-	8280	22:00-	8381	23:00-	8340	24:00-	8324

Tuesday 07/11/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
19	13	5	12	54	551	1214	1353	1102	600	343	407	433	358	375	347	329	368	294	285	245	207	89	37	9040
8	3	1	2	4	52	292	325	305	160	95	108	103	109	96	111	93	106	80	67	79	75	31	5	
5	4	2	4	8	90	294	314	343	152	101	96	122	88	72	78	82	89	71	85	58	58	26	8	
4	1	1	3	13	180	288	345	246	179	88	92	106	85	92	73	93	77	76	61	56	39	21	15	
2	5	1	3	29	229	340	369	208	109	59	111	102	76	115	85	61	96	67	72	52	35	11	9	

AM Peak Hour ..... 07:30 to 08:30 (1362 vehicles)
AM Peak Hour Factor 92.3%
PM Peak Hour ..... 12:15 to 13:15 (439 vehicles)
PM Peak Hour Factor 90.0%

24-Hour Moving Total

01:00-	8324	02:00-	8329	03:00-	8323	04:00-	8316	05:00-	8342	06:00-	8373	07:00-	8508	08:00-	8697								
09:00-	8700	10:00-	8768	11:00-	8791	12:00-	8832	13:00-	8914	14:00-	8932	15:00-	8962	16:00-	8975								
17:00-	8959	18:00-	8968	19:00-	8933	20:00-	8993	21:00-	9017	22:00-	9041	23:00-	9041	24:00-	9040								

Wednesday 07/12/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
21	6	10	7	44	535	1084	1227	1084	478	308	367	387	356	386	345	344	307	253	203	246	194	80	27	8299
8	2	1	2	5	50	273	302	282	141	76	115	92	82	93	81	72	82	53	39	73	62	26	7	
5	1	2	3	7	70	268	308	316	122	85	82	88	85	92	88	76	78	71	55	52	57	28	15	
3	2	4	1	17	146	273	312	249	120	82	87	112	91	109	85	92	72	69	58	58	39	16	3	
5	1	3	1	15	269	270	305	237	95	65	83	95	98	92	91	104	75	60	51	63	36	10	2	

AM Peak Hour ..... 07:00 to 08:00 (1227 vehicles)
AM Peak Hour Factor 98.3%
PM Peak Hour ..... 13:45 to 14:45 (392 vehicles)
PM Peak Hour Factor 89.9%

24-Hour Moving Total

01:00-	9042	02:00-	9035	03:00-	9040	04:00-	9035	05:00-	9025	06:00-	9009	07:00-	8879	08:00-	8753								
09:00-	8735	10:00-	8613	11:00-	8578	12:00-	8538	13:00-	8492	14:00-	8490	15:00-	8501	16:00-	8499								
17:00-	8514	18:00-	8453	19:00-	8412	20:00-	8330	21:00-	8331	22:00-	8318	23:00-	8309	24:00-	8299								

Thursday 07/13/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
23	7	11	13	48	542	1062	1170	1133	655	354	369	335	375	326	363	386	367	347	188	202	155	79	36	8546
10	5	3	5	5	42	258	279	297	221	95	97	72	82	108	82	111	103	94	55	50	45	15	13	
4	1	4	4	9	82	279	271	286	228	72	61	90	91	91	106	90	95	102	49	53	55	20	9	
3	0	3	3	13	150	252	311	252	101	91	101	88	97	29	90	103	87	80	47	61	38	25	8	
6	1	1	1	21	268	273	309	296	105	96	110	85	105	98	85	82	82	71	37	38	17	19	6	

AM Peak Hour ..... 07:30 to 08:30 (1205 vehicles)
AM Peak Hour Factor 96.9%
PM Peak Hour ..... 13:15 to 14:15 (401 vehicles)
PM Peak Hour Factor 92.8%

24-Hour Moving Total

01:00-	8301	02:00-	8302	03:00-	8303	04:00-	8309	05:00-	8313	06:00-	8320	07:00-	8298	08:00-	8241
09:00-	8290	10:00-	8467	11:00-	8513	12:00-	8515	13:00-	8463	14:00-	8482	15:00-	8422	16:00-	8440
17:00-	8482	18:00-	8542	19:00-	8636	20:00-	8621	21:00-	8577	22:00-	8538	23:00-	8537	24:00-	8546

Friday 07/14/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
18	15	11	13	53	598	1304	1267	954	470	480	399	366	416	406	438	511	423	265	271	193	181	107	69	9228
3	7	1	2	3	49	347	311	292	139	141	92	76	111	97	89	87	122	61	52	51	65	30	21	
1	5	4	1	8	101	324	321	251	141	143	98	91	115	112	98	146	111	63	88	50	42	33	15	
7	2	3	6	15	172	332	315	220	98	108	106	98	92	91	109	138	98	70	69	53	45	21	17	
7	1	3	4	27	276	301	320	191	92	88	103	101	98	106	142	140	92	71	62	39	29	23	16	

AM Peak Hour ..... 06:00 to 07:00 (1304 vehicles)
AM Peak Hour Factor 93.9%
PM Peak Hour ..... 16:15 to 17:15 (546 vehicles)
PM Peak Hour Factor 93.5%

24-Hour Moving Total

01:00-	8541	02:00-	8549	03:00-	8549	04:00-	8549	05:00-	8554	06:00-	8610	07:00-	8852	08:00-	8949
09:00-	8770	10:00-	8585	11:00-	8711	12:00-	8741	13:00-	8772	14:00-	8813	15:00-	8893	16:00-	8968
17:00-	9093	18:00-	9149	19:00-	9067	20:00-	9150	21:00-	9141	22:00-	9167	23:00-	9195	24:00-	9228

Saturday 07/15/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
59	27	27	17	27	39	112	188	273	330	425	446	436	440	372	352	301	282	249	190	164	128	88	72	5044
18	6	7	3	9	4	18	45	55	95	92	111	108	123	107	89	86	79	62	49	41	39	27	16	
15	5	6	4	6	6	28	41	62	78	88	114	115	122	92	92	79	68	65	52	43	25	18	18	
14	7	8	6	4	15	25	50	74	66	120	116	121	96	91	83	63	71	67	46	42	31	22	15	
12	9	6	4	8	14	41	52	82	91	125	105	92	99	82	88	73	64	55	43	38	33	21	23	

AM Peak Hour ..... 10:30 to 11:30 (470 vehicles)
AM Peak Hour Factor 94.0%
PM Peak Hour ..... 12:30 to 13:30 (458 vehicles)
PM Peak Hour Factor 93.1%

24-Hour Moving Total

01:00-	9269	02:00-	9281	03:00-	9297	04:00-	9301	05:00-	9275	06:00-	8716	07:00-	7524	08:00-	6445
09:00-	5764	10:00-	5624	11:00-	5569	12:00-	5616	13:00-	5686	14:00-	5710	15:00-	5676	16:00-	5590
17:00-	5380	18:00-	5239	19:00-	5223	20:00-	5142	21:00-	5113	22:00-	5060	23:00-	5041	24:00-	5044

Sunday 07/16/95 Channel: 1 Direction: E

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
68	45	30	16	11	38	109	173	249	343	464	567	636	526	563	433	336	257	247	167	140	96	130	44	5688
20	10	8	4	3	6	17	42	43	71	109	162	131	121	181	110	112	61	65	38	38	22	81	13	
16	11	8	5	3	5	25	41	61	81	102	151	180	172	120	106	80	63	52	42	39	28	17	16	
15	6	5	3	2	9	36	46	59	88	111	126	186	121	170	115	71	68	68	45	32	25	20	9	
17	18	9	4	3	18	31	44	86	103	142	128	139	112	92	102	73	65	62	42	31	21	12	6	

AM Peak Hour ..... 10:45 to 11:45 (581 vehicles)
AM Peak Hour Factor 89.7%
PM Peak Hour ..... 12:00 to 13:00 (636 vehicles)
PM Peak Hour Factor 85.5%

24-Hour Moving Total

01:00-	5053	02:00-	5071	03:00-	5074	04:00-	5073	05:00-	5057	06:00-	5056	07:00-	5053	08:00-	5038
09:00-	5014	10:00-	5027	11:00-	5066	12:00-	5187	13:00-	5387	14:00-	5473	15:00-	5664	16:00-	5745
17:00-	5780	18:00-	5755	19:00-	5753	20:00-	5730	21:00-	5706	22:00-	5674	23:00-	5716	24:00-	5688

Volume Count Report

Generated by MSC3000 Version 2.00 Copyright 1990, 1991 Mitron Systems Corporation

Location ..... US RTE. 29 E. OF RTE.234, WESTBOUND
Location Code ..... LOC 44 WB
County ..... PRINCE WILLIAM, VA
Recorder Set 07/07/95 12:25
Recording Start ... 07/07/95 13:00
Recording End 07/17/95 11:30
Sample Time ..... 15 Minutes
Operator Number ... 9
Machine Number 33
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 07/07/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
													492	594	834	1017	1009	433	581	367	152	133	92	5704
													127	135	168	251	275	92	179	108	41	38	23	
													134	131	235	266	210	92	158	88	54	36	31	
													114	164	206	245	264	48	133	98	34	38	14	
													117	164	225	255	260	201	111	73	23	21	24	

AM Peak Hour ..... Unavailable
AM Peak Hour Factor ..... Unavailable
PM Peak Hour ..... 16:15 to 17:15 (1041 vehicles)
PM Peak Hour Factor 94.6%

Saturday 07/08/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
46	32	21	13	14	25	71	180	247	411	497	501	564	572	520	518	450	329	299	306	198	112	70	59	6055
17	16	2	6	0	6	15	33	44	90	123	117	172	141	131	120	186	94	86	71	61	21	24	15	
11	7	11	3	6	4	17	24	38	94	101	141	128	149	123	108	98	86	86	92	45	29	21	16	
8	8	6	4	5	4	17	50	91	113	130	131	151	137	119	115	77	89	64	71	48	29	12	14	
10	1	2	0	3	11	22	73	74	114	143	112	113	145	147	175	89	60	63	72	44	33	13	14	

AM Peak Hour ..... 10:45 to 11:45 (532 vehicles)
AM Peak Hour Factor 93.0%
PM Peak Hour ..... 15:15 to 16:15 (584 vehicles)
PM Peak Hour Factor 78.5%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	N/A	13:00-	N/A	14:00-	8326	15:00-	8406	16:00-	8332
17:00-	8016	18:00-	7449	19:00-	6769	20:00-	6635	21:00-	6360	22:00-	6191	23:00-	6151	24:00-	6088

Sunday 07/09/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
44	12	12	9	3	11	18	46	166	261	414	462	644	449	486	453	335	362	257	228	131	107	52	32	4994
15	6	3	3	1	1	4	11	20	48	83	103	89	118	113	124	93	76	74	69	31	37	14	7	
9	3	2	1	1	3	2	6	37	57	103	111	195	107	115	122	82	140	67	65	40	34	15	10	
10	3	3	5	1	1	7	11	44	89	125	117	175	115	121	109	80	74	63	40	33	22	12	8	
10	0	4	0	0	6	5	18	65	67	103	131	185	109	137	98	80	72	53	54	27	14	11	7	

AM Peak Hour ..... 11:00 to 12:00 (462 vehicles)
AM Peak Hour Factor 88.2%
PM Peak Hour ..... 12:15 to 13:15 (673 vehicles)
PM Peak Hour Factor 86.3%

24-Hour Moving Total

01:00-	6053	02:00-	6033	03:00-	6024	04:00-	6020	05:00-	6009	06:00-	5995	07:00-	5942	08:00-	5808
09:00-	5727	10:00-	5577	11:00-	5494	12:00-	5455	13:00-	5535	14:00-	5412	15:00-	5378	16:00-	5313
17:00-	5198	18:00-	5231	19:00-	5189	20:00-	5111	21:00-	5044	22:00-	5039	23:00-	5021	24:00-	4994

Monday 07/10/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
29	13	7	4	9	35	100	214	250	203	326	282	288	291	379	692	951	1061	871	341	133	76	50	25	6630
14	2	2	2	2	3	13	37	43	33	75	67	72	75	67	123	205	256	261	127	47	16	16	9	
5	6	0	1	1	8	18	39	73	60	86	76	71	75	99	185	230	273	254	75	39	22	10	7	
8	2	1	1	4	8	30	79	74	45	83	62	65	59	100	167	254	271	199	74	23	20	13	4	
2	3	4	0	2	16	39	59	60	65	82	77	80	82	113	217	262	261	157	65	24	18	11	5	

AM Peak Hour ..... 10:00 to 11:00 (326 vehicles)
AM Peak Hour Factor 94.8%
PM Peak Hour ..... 17:15 to 18:15 (1066 vehicles)
PM Peak Hour Factor 97.6%

24-Hour Moving Total

01:00-	4979	02:00-	4980	03:00-	4975	04:00-	4970	05:00-	4976	06:00-	5000	07:00-	5082	08:00-	5250
09:00-	5334	10:00-	5276	11:00-	5188	12:00-	5008	13:00-	4652	14:00-	4494	15:00-	4387	16:00-	4626
17:00-	5242	18:00-	5941	19:00-	6555	20:00-	6668	21:00-	6670	22:00-	6639	23:00-	6637	24:00-	6630

Tuesday 07/11/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
16	10	2	3	6	26	62	208	308	307	307	276	331	337	437	780	1096	1146	1075	498	293	212	125	64	7925
6	2	1	2	1	0	10	24	62	87	80	74	102	87	107	162	279	242	310	182	81	48	43	17	
6	5	0	0	1	9	20	37	86	83	70	62	65	82	86	177	270	321	303	130	81	57	30	20	
2	2	0	1	1	4	17	76	76	66	82	76	97	74	107	202	277	295	277	115	75	54	29	11	
2	1	1	0	3	13	15	71	84	71	75	64	67	94	137	239	270	288	185	71	56	53	23	16	

AM Peak Hour ..... 08:15 to 09:15 (333 vehicles)
AM Peak Hour Factor 95.7%
PM Peak Hour ..... 17:15 to 18:15 (1214 vehicles)
PM Peak Hour Factor 94.5%

24-Hour Moving Total

01:00-	6617	02:00-	6614	03:00-	6609	04:00-	6608	05:00-	6605	06:00-	6596	07:00-	6558	08:00-	6552
09:00-	6610	10:00-	6714	11:00-	6695	12:00-	6689	13:00-	6732	14:00-	6778	15:00-	6836	16:00-	6924
17:00-	7069	18:00-	7154	19:00-	7358	20:00-	7515	21:00-	7675	22:00-	7811	23:00-	7886	24:00-	7925

Wednesday 07/12/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
33	25	19	23	9	54	124	264	299	322	324	356	374	368	471	810	1031	1122	1090	518	285	223	142	70	8356
8	10	8	9	2	2	23	45	66	63	64	106	93	73	117	152	253	251	305	153	77	67	44	20	
13	4	4	10	1	9	30	73	71	82	93	93	86	93	136	185	249	284	294	135	86	48	39	17	
6	2	6	4	4	20	33	72	69	82	105	68	85	96	88	216	278	300	285	139	66	57	37	17	
6	9	1	0	2	23	38	74	93	95	62	89	110	106	130	257	251	287	206	91	56	51	22	16	

AM Peak Hour ..... 10:15 to 11:15 (366 vehicles)
AM Peak Hour Factor 86.3%
PM Peak Hour ..... 17:30 to 18:30 (1186 vehicles)
PM Peak Hour Factor 97.2%

24-Hour Moving Total

01:00-	7942	02:00-	7957	03:00-	7974	04:00-	7994	05:00-	7997	06:00-	8025	07:00-	8087	08:00-	8143
09:00-	8134	10:00-	8149	11:00-	8166	12:00-	8246	13:00-	8289	14:00-	8320	15:00-	8354	16:00-	8384
17:00-	8319	18:00-	8295	19:00-	8310	20:00-	8330	21:00-	8322	22:00-	8333	23:00-	8350	24:00-	8356

Thursday 07/13/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
38	25	14	13	10	53	129	289	353	339	337	395	408	428	534	755	1056	1079	833	521	324	252	150	100	8435
9	12	6	4	2	8	35	61	92	83	81	121	106	90	105	152	268	268	251	142	84	78	53	36	
15	9	4	2	2	5	19	65	86	80	75	89	96	110	149	179	282	284	243	146	93	62	35	23	
7	3	2	4	3	15	35	77	86	58	97	97	98	122	144	204	254	268	191	135	83	65	32	25	
7	1	2	3	3	25	40	86	89	118	84	88	108	106	136	220	252	259	148	98	64	47	30	16	

AM Peak Hour ..... 11:00 to 12:00 (395 vehicles)
AM Peak Hour Factor 81.6%
PM Peak Hour ..... 17:00 to 18:00 (1079 vehicles)
PM Peak Hour Factor 95.0%

24-Hour Moving Total

01:00-	8361	02:00-	8361	03:00-	8356	04:00-	8346	05:00-	8347	06:00-	8346	07:00-	8351	08:00-	8376
09:00-	8430	10:00-	8447	11:00-	8460	12:00-	8499	13:00-	8533	14:00-	8593	15:00-	8656	16:00-	8601
17:00-	8626	18:00-	8583	19:00-	8326	20:00-	8329	21:00-	8368	22:00-	8397	23:00-	8405	24:00-	8435

Friday 07/14/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
46	30	12	14	17	67	154	304	347	315	413	447	529	647	677	972	1135	1105	1089	609	345	263	213	133	9883
18	11	1	6	3	6	20	69	79	63	96	101	119	132	154	212	272	280	286	128	115	62	59	35	
17	5	3	3	4	15	32	66	80	80	102	120	132	142	154	221	315	284	289	171	81	73	66	22	
7	9	2	2	10	21	46	77	94	83	101	92	127	174	184	292	269	269	277	161	75	71	41	34	
4	5	6	3	0	25	56	92	94	89	114	134	151	199	185	247	279	272	237	149	74	57	47	42	

AM Peak Hour ..... 11:00 to 12:00 (447 vehicles)
AM Peak Hour Factor 83.4%
PM Peak Hour ..... 16:15 to 17:15 (1143 vehicles)
PM Peak Hour Factor 90.7%

24-Hour Moving Total

01:00-	8443	02:00-	8448	03:00-	8446	04:00-	8447	05:00-	8454	06:00-	8468	07:00-	8493	08:00-	8508
09:00-	8502	10:00-	8478	11:00-	8554	12:00-	8606	13:00-	8727	14:00-	8946	15:00-	9089	16:00-	9306
17:00-	9385	18:00-	9411	19:00-	9667	20:00-	9755	21:00-	9776	22:00-	9787	23:00-	9850	24:00-	9883

Saturday 07/15/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
82	39	33	25	21	57	123	241	348	457	561	622	582	540	564	475	421	386	385	419	265	192	175	121	7134
33	10	11	8	11	10	9	45	46	121	138	184	158	152	139	133	108	96	103	115	75	56	52	33	
20	10	10	9	3	14	26	62	96	119	145	140	127	131	156	116	109	88	93	130	68	57	33	35	
15	8	7	4	4	11	36	65	88	88	137	142	159	139	132	119	119	93	97	93	77	38	43	30	
14	11	5	4	3	22	52	69	118	129	141	156	138	118	137	107	85	109	92	81	45	41	47	23	

AM Peak Hour ..... 11:00 to 12:00 (622 vehicles)
AM Peak Hour Factor 84.5%
PM Peak Hour ..... 12:00 to 13:00 (582 vehicles)
PM Peak Hour Factor 91.5%

24-Hour Moving Total

01:00-	9919	02:00-	9928	03:00-	9949	04:00-	9960	05:00-	9964	06:00-	9954	07:00-	9923	08:00-	9860								
09:00-	9861	10:00-	10003	11:00-	10151	12:00-	10326	13:00-	10379	14:00-	10272	15:00-	10159	16:00-	9662								
17:00-	8948	18:00-	8229	19:00-	7525	20:00-	7335	21:00-	7255	22:00-	7184	23:00-	7146	24:00-	7134								

Sunday 07/16/95 Channel: 1 Direction: W

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
77	48	39	10	13	29	51	121	165	220	332	420	568	502	434	471	465	397	324	283	141	91	60	52	5313
22	14	18	2	2	2	8	20	26	47	68	109	106	124	109	101	94	112	76	69	30	16	19	9	
19	12	7	5	5	8	18	30	43	52	71	115	129	117	98	106	121	120	81	86	42	27	17	18	
21	10	4	1	4	9	14	31	41	56	102	94	166	146	115	139	111	82	96	67	26	20	14	10	
15	12	10	2	2	10	11	40	55	65	91	102	167	115	112	125	139	83	71	61	43	28	10	15	

AM Peak Hour ..... 11:00 to 12:00 (420 vehicles)
AM Peak Hour Factor 91.3%
PM Peak Hour ..... 12:15 to 13:15 (586 vehicles)
PM Peak Hour Factor 87.7%

24-Hour Moving Total

01:00-	7129	02:00-	7138	03:00-	7144	04:00-	7129	05:00-	7121	06:00-	7093	07:00-	7021	08:00-	6901								
09:00-	6718	10:00-	6481	11:00-	6252	12:00-	6050	13:00-	6036	14:00-	5998	15:00-	5868	16:00-	5864								
17:00-	5908	18:00-	5919	19:00-	5858	20:00-	5722	21:00-	5598	22:00-	5497	23:00-	5382	24:00-	5313								

Volume Count Report

Generated by MSC3000 Version 2.00 Copyright 1990, 1991 Mitron Systems Corporation

Location ..... RTE. 234 S. OF US 29, NORTHBOUND
Location Code ..... LOC 31 NB
County ..... PRINCE WILLIAM, VA
Recorder Set 07/07/95 11:58
Recording Start ... 07/07/95 12:00
Recording End 07/17/95 11:30
Sample Time ..... 15 Minutes
Operator Number ... 9
Machine Number 4
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 07/07/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
												431	478	492	497	548	487	440	385	405	342	221	145	4871
												92	107	127	120	150	133	128	89	91	95	73	42	
												126	122	115	107	151	110	115	90	114	105	56	32	
												110	117	123	129	138	137	94	126	98	82	45	39	
												103	132	127	141	109	107	103	80	102	60	47	32	

AM Peak Hour ..... Unavailable
AM Peak Hour Factor ..... Unavailable
PM Peak Hour ..... 15:45 to 16:45 (580 vehicles)
PM Peak Hour Factor 96.0%

Saturday 07/08/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
92	45	40	24	29	61	132	196	268	334	431	535	574	532	550	514	539	456	479	386	351	296	239	146	7249
33	12	13	3	9	7	35	42	61	71	89	110	143	153	137	130	134	116	121	101	89	71	77	44	
20	15	13	7	7	9	38	49	59	81	114	139	133	135	125	142	129	95	126	95	89	60	63	33	
24	11	8	5	7	18	29	56	75	89	115	132	144	102	148	126	129	125	106	95	95	81	51	29	
15	7	6	9	6	27	30	49	73	93	113	154	154	142	140	116	147	120	126	95	78	84	48	40	

AM Peak Hour ..... 11:00 to 12:00 (535 vehicles)
AM Peak Hour Factor 86.9%
PM Peak Hour ..... 12:30 to 13:30 (586 vehicles)
PM Peak Hour Factor 95.1%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	N/A	13:00-	7058	14:00-	7201	15:00-	7255	16:00-	7313
17:00-	7330	18:00-	7321	19:00-	7290	20:00-	7329	21:00-	7330	22:00-	7276	23:00-	7230	24:00-	7248

Sunday 07/09/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
105	58	38	22	15	34	38	93	171	272	314	403	552	576	636	569	516	476	384	327	270	173	143	124	6309
23	18	11	6	3	6	5	18	27	68	66	89	117	156	173	145	136	122	106	86	80	54	39	35	
44	15	9	3	4	4	16	21	50	71	86	110	137	142	166	148	139	115	97	71	80	41	39	38	
15	8	9	8	7	9	9	20	43	58	73	118	152	135	165	125	133	124	95	85	51	41	32	32	
23	17	9	5	1	15	8	34	51	75	89	86	146	143	132	151	108	115	86	85	59	37	33	19	

AM Peak Hour ..... 10:45 to 11:45 (406 vehicles)
AM Peak Hour Factor 86.0%
PM Peak Hour ..... 13:45 to 14:45 (647 vehicles)
PM Peak Hour Factor 93.5%

24-Hour Moving Total

01:00-	7262	02:00-	7275	03:00-	7273	04:00-	7271	05:00-	7257	06:00-	7230	07:00-	7136	08:00-	7033
09:00-	6936	10:00-	6874	11:00-	6757	12:00-	6625	13:00-	6603	14:00-	6647	15:00-	6733	16:00-	6788
17:00-	6765	18:00-	6785	19:00-	6690	20:00-	6631	21:00-	6550	22:00-	6427	23:00-	6331	24:00-	6309

Monday 07/10/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
52	25	15	17	27	279	646	693	590	320	330	371	455	417	425	452	458	562	391	380	371	341	182	80	7879
17	10	8	3	2	19	166	160	191	83	73	69	127	107	93	104	114	152	93	94	87	78	71	24	
17	4	1	5	10	47	159	170	153	83	90	102	102	109	118	117	114	140	105	103	97	85	55	22	
11	7	2	3	5	82	156	161	150	74	78	92	104	111	114	136	118	126	94	88	77	99	29	22	
7	4	4	6	10	131	165	202	96	80	89	108	122	90	100	95	112	144	99	95	110	79	27	12	

AM Peak Hour ..... 07:15 to 08:15 (724 vehicles)
AM Peak Hour Factor 89.6%
PM Peak Hour ..... 17:00 to 18:00 (562 vehicles)
PM Peak Hour Factor 92.4%

24-Hour Moving Total

01:00-	6256	02:00-	6223	03:00-	6200	04:00-	6195	05:00-	6207	06:00-	6452	07:00-	7060	08:00-	7660
09:00-	8079	10:00-	8127	11:00-	8143	12:00-	8111	13:00-	8014	14:00-	7855	15:00-	7644	16:00-	7527
17:00-	7469	18:00-	7555	19:00-	7562	20:00-	7615	21:00-	7716	22:00-	7884	23:00-	7923	24:00-	7879

Tuesday 07/11/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
39	27	15	8	26	306	700	791	541	313	350	380	418	447	451	472	449	462	433	424	392	376	185	92	8097
11	8	4	2	3	22	168	197	169	80	84	80	106	115	130	121	100	111	133	95	101	92	59	31	
7	6	4	1	8	45	167	191	149	81	82	105	105	107	93	103	116	127	85	103	94	96	51	20	
13	7	2	2	9	98	182	175	131	90	79	98	103	105	121	117	120	121	113	123	94	103	39	16	
8	6	5	3	6	141	183	228	92	62	105	97	104	120	107	131	113	103	102	103	103	85	36	25	

AM Peak Hour ..... 07:00 to 08:00 (791 vehicles)
AM Peak Hour Factor 86.7%
PM Peak Hour ..... 17:15 to 18:15 (484 vehicles)
PM Peak Hour Factor 91.0%

24-Hour Moving Total

01:00-	7866	02:00-	7868	03:00-	7868	04:00-	7859	05:00-	7858	06:00-	7885	07:00-	7939	08:00-	8037
09:00-	7988	10:00-	7981	11:00-	8001	12:00-	8010	13:00-	7973	14:00-	8003	15:00-	8029	16:00-	8049
17:00-	8040	18:00-	7940	19:00-	7982	20:00-	8026	21:00-	8047	22:00-	8082	23:00-	8085	24:00-	8097

Wednesday 07/12/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
56	33	15	9	27	267	681	710	571	331	301	373	443	443	378	450	482	500	446	365	383	343	184	90	7881
26	7	5	5	10	20	178	184	186	90	72	91	111	104	105	111	121	123	117	86	96	75	60	36	
12	9	6	1	7	45	180	204	134	87	79	93	90	105	76	119	119	125	115	92	93	100	51	18	
9	11	3	2	4	79	140	161	130	80	79	86	112	126	96	118	133	123	113	98	87	95	41	17	
9	6	1	1	6	123	183	161	121	74	71	103	130	108	101	102	109	129	101	89	107	73	32	19	

AM Peak Hour ..... 06:45 to 07:45 (732 vehicles)
AM Peak Hour Factor 89.7%
PM Peak Hour ..... 17:00 to 18:00 (500 vehicles)
PM Peak Hour Factor 96.9%

24-Hour Moving Total

01:00-	8114	02:00-	8120	03:00-	8120	04:00-	8121	05:00-	8122	06:00-	8083	07:00-	8064	08:00-	7983
09:00-	8013	10:00-	8031	11:00-	7982	12:00-	7975	13:00-	8000	14:00-	7996	15:00-	7923	16:00-	7901
17:00-	7934	18:00-	7972	19:00-	7985	20:00-	7926	21:00-	7917	22:00-	7884	23:00-	7883	24:00-	7881

Thursday 07/13/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
54	32	20	14	31	289	705	712	606	315	345	386	500	421	424	424	486	491	442	438	397	331	193	108	8164
15	7	5	5	2	27	181	169	198	87	92	98	151	109	105	100	114	116	126	111	104	101	67	28	
13	16	7	4	9	36	182	196	157	96	92	74	123	85	100	88	129	130	109	97	97	84	57	36	
13	7	3	3	10	87	179	170	151	63	76	127	131	102	115	122	124	108	119	109	92	80	39	28	
13	2	5	2	10	139	163	177	100	69	85	87	95	125	104	114	119	137	88	121	104	66	30	16	

AM Peak Hour ..... 07:15 to 08:15 (741 vehicles)
AM Peak Hour Factor 93.6%
PM Peak Hour ..... 17:15 to 18:15 (501 vehicles)
PM Peak Hour Factor 91.4%

24-Hour Moving Total

01:00-	7879	02:00-	7878	03:00-	7883	04:00-	7888	05:00-	7892	06:00-	7914	07:00-	7938	08:00-	7940								
09:00-	7975	10:00-	7959	11:00-	8003	12:00-	8016	13:00-	8073	14:00-	8051	15:00-	8097	16:00-	8071								
17:00-	8075	18:00-	8066	19:00-	8062	20:00-	8135	21:00-	8149	22:00-	8137	23:00-	8146	24:00-	8164								

Friday 07/14/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
65	16	20	16	24	282	619	700	499	287	325	411	462	520	426	484	487	488	383	355	390	350	245	141	7995
20	4	5	5	6	18	154	184	149	58	72	100	99	108	110	127	125	112	90	101	103	99	70	44	
18	3	1	6	4	45	159	173	136	83	94	95	119	151	106	123	127	134	94	91	90	91	71	38	
17	6	4	1	6	94	164	163	116	81	75	100	119	134	107	120	130	125	98	82	107	77	56	30	
10	3	10	4	8	125	142	180	98	65	84	116	125	127	103	114	105	117	101	81	90	83	48	29	

AM Peak Hour ..... 07:00 to 08:00 (700 vehicles)
AM Peak Hour Factor 95.1%
PM Peak Hour ..... 13:15 to 14:15 (522 vehicles)
PM Peak Hour Factor 86.4%

24-Hour Moving Total

01:00-	8175	02:00-	8159	03:00-	8159	04:00-	8161	05:00-	8154	06:00-	8147	07:00-	8061	08:00-	8049								
09:00-	7942	10:00-	7914	11:00-	7894	12:00-	7919	13:00-	7881	14:00-	7980	15:00-	7982	16:00-	8042								
17:00-	8043	18:00-	8040	19:00-	7981	20:00-	7898	21:00-	7891	22:00-	7910	23:00-	7962	24:00-	7995								

Saturday 07/15/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
80	55	36	18	28	69	158	199	232	273	383	447	532	548	534	471	453	398	365	343	300	303	193	184	6602
26	18	16	6	8	11	36	49	50	57	72	112	135	145	136	109	109	93	79	87	95	93	48	45	
16	11	0	7	6	12	40	35	67	62	100	114	128	148	141	119	117	125	104	91	79	74	56	44	
14	18	12	1	7	24	42	60	41	77	97	116	136	145	123	127	123	100	103	93	60	77	40	39	
24	8	8	4	7	22	40	55	74	77	114	105	133	110	134	116	104	80	79	72	66	59	49	56	

AM Peak Hour ..... 10:45 to 11:45 (456 vehicles)
AM Peak Hour Factor 98.3%
PM Peak Hour ..... 12:45 to 13:45 (571 vehicles)
PM Peak Hour Factor 96.5%

24-Hour Moving Total

01:00-	8010	02:00-	8049	03:00-	8065	04:00-	8067	05:00-	8071	06:00-	7858	07:00-	7397	08:00-	6896
09:00-	6629	10:00-	6615	11:00-	6673	12:00-	6709	13:00-	6779	14:00-	6807	15:00-	6915	16:00-	6902
17:00-	6868	18:00-	6778	19:00-	6760	20:00-	6748	21:00-	6658	22:00-	6611	23:00-	6559	24:00-	6602

Sunday 07/16/95 Channel: 1 Direction: N

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
136	51	47	25	23	26	57	105	160	217	289	339	426	445	452	452	426	413	353	336	397	300	183	129	5787
50	16	16	8	5	6	14	15	30	56	66	80	102	91	105	112	101	104	103	87	112	76	51	47	
34	15	17	6	3	9	15	20	37	71	71	71	85	116	116	111	114	116	83	87	95	78	48	26	
27	13	3	4	7	4	16	35	43	46	67	102	123	118	112	116	110	95	93	76	88	82	45	31	
25	7	11	7	8	7	12	35	50	44	85	86	116	120	119	113	101	98	74	86	102	64	39	25	

AM Peak Hour ..... 11:00 to 12:00 (339 vehicles)
AM Peak Hour Factor 83.1%
PM Peak Hour ..... 13:15 to 14:15 (459 vehicles)
PM Peak Hour Factor 95.6%

24-Hour Moving Total

01:00-	6658	02:00-	6654	03:00-	6665	04:00-	6672	05:00-	6667	06:00-	6624	07:00-	6523	08:00-	6429
09:00-	6357	10:00-	6301	11:00-	6207	12:00-	6099	13:00-	5993	14:00-	5890	15:00-	5808	16:00-	5789
17:00-	5762	18:00-	5777	19:00-	5765	20:00-	5758	21:00-	5855	22:00-	5852	23:00-	5842	24:00-	5787

Volume Count Report

Generated by MSC3000 Version 2.00 Copyright 1990, 1991 Mitron Systems Corporation

Location ..... RTE. 234 S. OF US 29, SOUTHBOUND
Location Code ..... LOC 33 SB
County ..... PRINCE WILLIAM, VA
Recorder Set 07/07/95 12:05
Recording Start ... 07/07/95 13:00
Recording End 07/17/95 11:30
Sample Time ..... 15 Minutes
Operator Number ... 9
Machine Number 47
Channel 1
Divide By 2
Summation ..... No
Two-Way ..... No

Friday 07/07/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
													642	616	849	965	881	780	495	376	239	175	126	6144
													164	157	179	218	273	209	137	97	57	56	37	
													167	144	216	229	221	210	117	92	72	49	29	
													152	153	214	264	209	199	137	105	66	39	29	
													159	162	240	254	178	162	104	82	44	31	31	

AM Peak Hour ..... Unavailable
AM Peak Hour Factor ..... Unavailable
PM Peak Hour ..... 16:15 to 17:15 (1020 vehicles)
PM Peak Hour Factor 93.4%

Saturday 07/08/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
95	48	22	32	16	34	102	212	341	454	497	568	615	566	540	561	548	488	497	472	349	249	172	146	7624
24	21	11	9	3	10	7	34	57	94	116	142	167	148	123	137	170	125	120	115	106	59	51	33	
25	13	8	14	3	3	25	42	77	98	104	146	156	136	122	131	135	142	127	137	88	56	52	41	
18	8	3	5	5	8	32	74	100	136	144	146	151	142	148	140	128	126	115	102	82	71	39	38	
28	6	0	4	5	13	38	62	107	126	133	134	141	140	147	153	115	95	135	118	73	63	30	34	

AM Peak Hour ..... 11:00 to 12:00 (568 vehicles)
AM Peak Hour Factor 97.3%
PM Peak Hour ..... 12:00 to 13:00 (615 vehicles)
PM Peak Hour Factor 92.1%

24-Hour Moving Total

01:00-	N/A	02:00-	N/A	03:00-	N/A	04:00-	N/A	05:00-	N/A	06:00-	N/A	07:00-	N/A	08:00-	N/A
09:00-	N/A	10:00-	N/A	11:00-	N/A	12:00-	N/A	13:00-	N/A	14:00-	9180	15:00-	9104	16:00-	9028
17:00-	8740	18:00-	8323	19:00-	7930	20:00-	7647	21:00-	7624	22:00-	7597	23:00-	7607	24:00-	7604

Sunday 07/09/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
88	37	41	26	20	28	34	105	199	291	327	477	583	538	529	522	526	492	440	354	321	209	110	89	6386
34	11	13	9	7	5	4	23	32	57	80	107	137	130	124	121	119	120	104	95	83	75	27	34	
22	11	8	0	4	5	5	28	49	76	74	121	153	152	142	128	135	136	115	100	77	62	24	23	
20	6	6	8	4	6	9	25	48	81	84	121	151	123	111	130	145	111	113	85	89	39	41	23	
12	9	14	9	5	12	16	29	70	77	89	128	142	133	152	143	127	125	108	74	72	33	18	9	

AM Peak Hour ..... 11:00 to 12:00 (477 vehicles)
AM Peak Hour Factor 93.2%
PM Peak Hour ..... 12:00 to 13:00 (583 vehicles)
PM Peak Hour Factor 95.3%

24-Hour Moving Total

01:00-	7617	02:00-	7606	03:00-	7625	04:00-	7619	05:00-	7623	06:00-	7617	07:00-	7549	08:00-	7442								
09:00-	7300	10:00-	7137	11:00-	6967	12:00-	6876	13:00-	6844	14:00-	6816	15:00-	6805	16:00-	6766								
17:00-	6744	18:00-	6748	19:00-	6691	20:00-	6573	21:00-	6545	22:00-	6505	23:00-	6443	24:00-	6386								

Monday 07/10/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
58	24	18	18	25	86	248	347	435	334	415	391	395	386	449	561	722	916	799	431	267	201	108	75	7709
23	5	6	4	7	6	43	68	85	81	92	96	92	98	98	126	162	207	239	153	77	49	33	16	
13	10	3	1	4	30	47	70	106	87	112	109	93	98	111	139	181	217	198	98	73	63	19	21	
14	5	6	7	5	25	56	104	115	74	102	87	102	86	110	147	197	244	173	95	64	44	23	19	
8	4	3	6	9	25	102	105	129	92	109	99	108	104	130	149	182	248	189	85	53	45	33	19	

AM Peak Hour ..... 08:00 to 09:00 (435 vehicles)
AM Peak Hour Factor 84.3%
PM Peak Hour ..... 17:15 to 18:15 (948 vehicles)
PM Peak Hour Factor 95.6%

24-Hour Moving Total

01:00-	6356	02:00-	6343	03:00-	6320	04:00-	6312	05:00-	6317	06:00-	6375	07:00-	6589	08:00-	6831								
09:00-	7067	10:00-	7110	11:00-	7198	12:00-	7112	13:00-	6924	14:00-	6772	15:00-	6692	16:00-	6731								
17:00-	6927	18:00-	7351	19:00-	7710	20:00-	7787	21:00-	7733	22:00-	7725	23:00-	7723	24:00-	7709								

Tuesday 07/11/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
36	25	17	14	25	105	214	346	440	428	411	404	422	461	449	571	755	900	839	465	340	219	148	76	8110
11	3	6	1	7	15	29	71	96	122	120	104	115	129	118	106	189	200	246	134	100	56	46	22	
9	10	2	4	4	27	50	73	100	91	91	93	99	106	92	149	192	226	215	146	83	62	37	20	
11	5	6	7	3	25	64	79	101	91	98	98	117	104	121	137	178	228	224	103	78	53	44	19	
5	7	3	2	11	38	71	123	143	124	102	109	91	122	118	179	196	246	154	82	79	48	21	15	

AM Peak Hour ..... 08:15 to 09:15 (466 vehicles)
AM Peak Hour Factor 81.5%
PM Peak Hour ..... 17:15 to 18:15 (946 vehicles)
PM Peak Hour Factor 96.1%

24-Hour Moving Total

01:00-	7687	02:00-	7688	03:00-	7687	04:00-	7683	05:00-	7683	06:00-	7702	07:00-	7668	08:00-	7667
09:00-	7672	10:00-	7766	11:00-	7762	12:00-	7775	13:00-	7802	14:00-	7877	15:00-	7877	16:00-	7887
17:00-	7920	18:00-	7904	19:00-	7944	20:00-	7978	21:00-	8051	22:00-	8069	23:00-	8109	24:00-	8110

Wednesday 07/12/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
35	16	14	20	28	107	241	351	455	386	386	427	423	429	424	525	679	923	827	458	292	222	143	79	7890
13	5	4	5	3	12	34	76	106	97	94	115	99	88	105	106	143	194	247	131	74	74	44	17	
11	3	8	8	3	25	44	93	94	103	107	93	100	111	127	130	173	237	224	123	84	58	40	22	
5	2	2	2	12	29	57	82	109	84	97	101	106	119	72	115	178	235	189	116	70	44	35	18	
6	6	0	5	10	41	106	100	146	102	88	118	118	111	120	174	185	257	167	88	64	46	24	22	

AM Peak Hour ..... 08:00 to 09:00 (455 vehicles)
AM Peak Hour Factor 77.9%
PM Peak Hour ..... 17:15 to 18:15 (976 vehicles)
PM Peak Hour Factor 94.9%

24-Hour Moving Total

01:00-	8109	02:00-	8100	03:00-	8097	04:00-	8103	05:00-	8106	06:00-	8108	07:00-	8135	08:00-	8140
09:00-	8155	10:00-	8113	11:00-	8088	12:00-	8111	13:00-	8112	14:00-	8080	15:00-	8055	16:00-	8009
17:00-	7933	18:00-	7956	19:00-	7944	20:00-	7937	21:00-	7889	22:00-	7892	23:00-	7887	24:00-	7890

Thursday 07/13/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
45	23	22	16	26	123	230	356	484	468	410	413	463	421	451	593	780	883	746	460	340	241	143	98	8235
10	5	8	1	9	23	29	75	108	114	111	105	101	107	108	122	191	200	221	123	87	76	51	34	
13	13	8	4	4	27	43	64	116	111	92	97	100	98	106	143	201	234	193	119	87	58	33	29	
18	3	2	7	4	38	59	92	120	107	114	114	150	118	121	164	187	210	174	120	94	53	27	21	
4	2	4	4	9	35	99	125	140	136	93	97	112	98	116	164	201	239	158	98	72	54	32	14	

AM Peak Hour ..... 08:15 to 09:15 (490 vehicles)
AM Peak Hour Factor 87.5%
PM Peak Hour ..... 17:15 to 18:15 (904 vehicles)
PM Peak Hour Factor 94.6%

24-Hour Moving Total

01:00-	7900	02:00-	7907	03:00-	7915	04:00-	7911	05:00-	7909	06:00-	7925	07:00-	7914	08:00-	7919								
09:00-	7948	10:00-	8030	11:00-	8054	12:00-	8040	13:00-	8080	14:00-	8072	15:00-	8099	16:00-	8167								
17:00-	8268	18:00-	8228	19:00-	8147	20:00-	8149	21:00-	8197	22:00-	8216	23:00-	8216	24:00-	8235								

Friday 07/14/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
56	32	10	16	24	109	223	365	437	371	404	440	468	570	517	622	757	774	766	501	330	234	181	117	8324
21	7	2	5	5	11	35	96	89	93	101	109	123	141	128	129	200	176	215	125	102	67	48	28	
14	11	1	5	2	37	40	65	96	95	89	123	96	123	125	152	205	197	204	155	80	61	51	23	
13	6	1	3	6	30	74	87	121	80	116	103	121	130	144	162	172	209	182	112	76	50	44	37	
8	8	6	3	11	31	74	117	131	103	98	105	128	176	120	179	180	192	165	109	72	56	38	29	

AM Peak Hour ..... 10:30 to 11:30 (446 vehicles)
AM Peak Hour Factor 90.7%
PM Peak Hour ..... 17:30 to 18:30 (820 vehicles)
PM Peak Hour Factor 95.3%

24-Hour Moving Total

01:00-	8246	02:00-	8255	03:00-	8243	04:00-	8243	05:00-	8241	06:00-	8227	07:00-	8220	08:00-	8229								
09:00-	8182	10:00-	8085	11:00-	8079	12:00-	8106	13:00-	8111	14:00-	8260	15:00-	8326	16:00-	8355								
17:00-	8332	18:00-	8223	19:00-	8243	20:00-	8284	21:00-	8274	22:00-	8267	23:00-	8305	24:00-	8324								

Saturday 07/15/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
78	50	27	22	24	40	121	197	341	423	510	553	503	517	490	471	454	401	411	395	325	224	189	145	6911
24	16	8	7	7	4	23	33	70	104	131	132	143	132	122	128	113	99	119	112	89	61	45	49	
18	13	6	7	4	15	28	44	71	108	106	145	117	148	146	116	107	93	98	112	90	59	49	40	
12	11	9	4	7	9	28	64	94	97	136	135	123	122	120	110	116	100	99	86	88	60	42	34	
24	10	4	4	6	12	42	56	106	114	137	141	120	115	102	117	118	109	95	85	58	44	53	22	

AM Peak Hour ..... 11:00 to 12:00 (553 vehicles)
AM Peak Hour Factor 95.3%
PM Peak Hour ..... 12:30 to 13:30 (523 vehicles)
PM Peak Hour Factor 88.3%

24-Hour Moving Total

01:00-	8346	02:00-	8364	03:00-	8381	04:00-	8387	05:00-	8387	06:00-	8318	07:00-	8216	08:00-	8048
09:00-	7952	10:00-	8004	11:00-	8110	12:00-	8223	13:00-	8258	14:00-	8205	15:00-	8178	16:00-	8027
17:00-	7724	18:00-	7351	19:00-	6996	20:00-	6890	21:00-	6885	22:00-	6875	23:00-	6883	24:00-	6911

Sunday 07/16/95 Channel: 1 Direction: S

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	Totals
107	44	52	21	13	27	42	91	190	265	313	409	564	438	505	467	437	392	366	303	257	216	136	79	5734
28	9	18	6	6	7	7	19	37	53	77	97	123	113	138	100	101	119	98	96	72	46	46	18	
26	11	8	5	2	5	10	20	46	58	85	87	139	100	115	96	102	118	90	66	75	57	42	25	
23	14	12	1	5	5	11	26	42	74	75	101	141	123	131	141	125	84	92	70	51	65	22	23	
30	10	14	9	0	10	14	26	65	80	76	124	161	102	121	130	109	71	86	71	59	48	26	13	

AM Peak Hour ..... 11:00 to 12:00 (409 vehicles)
AM Peak Hour Factor 82.5%
PM Peak Hour ..... 12:00 to 13:00 (564 vehicles)
PM Peak Hour Factor 87.6%

24-Hour Moving Total

01:00-	6940	02:00-	6934	03:00-	6959	04:00-	6958	05:00-	6947	06:00-	6934	07:00-	6855	08:00-	6749
09:00-	6598	10:00-	6440	11:00-	6243	12:00-	6099	13:00-	6160	14:00-	6081	15:00-	6096	16:00-	6092
17:00-	6075	18:00-	6066	19:00-	6021	20:00-	5929	21:00-	5861	22:00-	5853	23:00-	5800	24:00-	5734

Appendix B - Turning Movement Count Data

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 234
Weather : Fair

Movements by: Primary

PAGE: 1
FILE: 29-234am
DATE: 5/20/95

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
6:00 AM	2	21	1	3	19	8	19	22	0	2	22	7	126
6:15	3	29	0	4	23	8	23	26	0	2	27	9	154
6:30	3	23	2	4	29	5	11	24	0	1	29	4	135
6:45	2	22	2	3	35	11	20	24	1	2	22	2	146
HR TOTAL	10	95	5	14	106	32	73	96	1	7	100	22	561
7:00 AM	1	31	2	3	52	18	18	19	2	3	23	12	184
7:15	2	28	3	16	48	4	17	27	6	6	21	10	188
7:30	1	37	9	17	53	4	26	28	4	4	37	3	223
7:45	1	49	9	30	39	3	28	23	5	1	35	1	224
HR TOTAL	5	145	23	66	192	29	89	97	17	14	116	26	819
8:00 AM	4	51	18	26	36	6	23	33	4	6	33	2	242
8:15	1	53	19	26	56	7	22	32	4	5	36	7	268
8:30	5	56	13	31	74	5	20	29	4	8	41	3	289
8:45	4	55	10	46	67	11	24	35	7	14	49	5	327
HR TOTAL	14	215	60	129	233	29	89	129	19	33	159	17	1126
DAY TOTAL	29	455	88	209	531	90	251	322	37	54	375	65	2506

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:00 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	8:00 AM	0.98	14	215	60	289	5	74	21
East	8:00 AM	0.79	129	233	29	391	33	60	7
South	8:00 AM	0.90	89	129	19	237	38	54	8
West	8:00 AM	0.77	33	159	17	209	16	76	8
Entire Intersection									
North	8:00 AM	0.98	14	215	60	289	5	74	21
East		0.79	129	233	29	391	33	60	7
South		0.90	89	129	19	237	38	54	8
West		0.77	33	159	17	209	16	76	8

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 234
Weather : Fair

PAGE: 1
FILE: 29-234mm

Movements by: Primary

DATE: 5/20/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
11:00 AM	6	68	13	36	98	13	31	80	13	9	35	9	411
11:15	3	58	12	57	124	11	61	60	14	13	44	6	463
11:30	5	65	7	48	121	9	40	60	8	14	28	9	414
11:45	8	68	17	29	162	8	59	74	14	8	42	2	491
HR TOTAL	22	259	49	170	505	41	191	274	49	44	149	26	1779
12:00 PM	5	77	16	54	92	14	60	74	12	9	50	11	474
12:15	6	76	7	65	108	14	55	72	12	27	52	7	501
12:30	14	67	13	59	109	13	56	56	15	13	60	2	477
12:45	5	50	10	53	97	15	50	80	14	3	62	9	448
HR TOTAL	30	270	46	231	406	56	221	282	53	52	224	29	1900
1:00 PM	5	66	16	47	126	13	50	75	27	12	46	14	497
1:15	8	66	19	49	104	12	58	92	23	11	32	5	479
DAY TOTAL	65	661	130	497	1141	122	520	723	152	119	451	74	4655

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION	START	PEAK HR	..... VOLUMES				.... PERCENTS ...		
FROM	PEAK HOUR	FACTOR	Right	Thru	Left	Total	Right	Thru	Left
North	11:45 AM	0.95	33	288	53	374	9	77	14
East	11:15 AM	0.92	188	499	42	729	26	68	6
South	12:30 PM	0.86	214	303	79	596	36	51	13
West	12:15 PM	0.89	55	220	32	307	18	72	10

Entire Intersection

North	11:45 AM	0.95	33	288	53	374	9	77	14
East		0.91	207	471	49	727	28	65	7
South		0.95	230	276	53	559	41	49	9
West		0.82	57	204	22	283	20	72	8

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 234
Weather : Fair

PAGE: 1
FILE: 29-234pm
Movements by: Primary
DATE: 5/20/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
3:30	0	60	12	51	79	14	67	65	20	20	57	4	449
3:45	1	66	11	44	90	15	46	95	15	11	56	2	452
HR TOTAL	1	126	23	95	169	29	113	160	35	31	113	6	901
4:00 PM	0	64	14	51	76	17	32	55	11	39	66	7	432
4:15	2	65	12	63	69	10	45	75	10	14	39	3	407
4:30	3	55	16	44	57	15	40	66	8	10	59	3	376
4:45	3	72	15	47	88	13	56	79	11	7	72	1	464
HR TOTAL	8	256	57	205	290	55	173	275	40	70	236	14	1679
5:00 PM	2	67	8	44	62	18	46	95	8	13	63	3	429
5:15	5	63	20	37	65	16	32	50	8	12	59	2	369
5:30	4	92	15	47	52	11	49	72	10	8	54	3	417
5:45	1	68	17	57	50	15	29	61	8	3	50	7	366
HR TOTAL	12	290	60	185	229	60	156	278	34	36	226	15	1581
6:00 PM	0	63	11	40	43	13	52	56	15	1	51	9	354
6:15	2	81	12	33	95	6	49	43	20	3	52	11	407
DAY TOTAL	23	816	163	558	826	163	543	812	144	141	678	55	4922

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION	START	PEAK HR	..... VOLUMES				.... PERCENTS ...		
FROM	PEAK HOUR	FACTOR	Right	Thru	Left	Total	Right	Thru	Left
North	4:45 PM	0.82	14	294	58	366	4	80	16
East	3:30 PM	0.97	209	314	56	579	36	54	10
South	4:15 PM	0.90	187	315	37	539	35	58	7
West	4:00 PM	0.71	70	236	14	320	22	74	4
Entire Intersection									
North	3:30 PM	0.97	3	255	49	307	1	83	16
East		0.97	209	314	56	579	36	54	10
South		0.86	190	290	56	536	35	54	10
West		0.71	84	218	16	318	26	69	5

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 234
Weather : Fair

PAGE: 1
FILE: 29-234ta
Movements by: Primary
DATE: 5/23/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
6:00 AM	2	28	31	5	15	4	125	44	1	1	219	4	479
6:15	2	27	43	7	14	7	131	25	1	2	222	5	486
6:30	4	41	84	9	21	8	133	54	2	1	205	5	567
6:45	4	37	81	4	32	8	156	36	0	2	221	2	583
HR TOTAL	12	133	239	25	82	27	545	159	4	6	867	16	2115
7:00 AM	3	57	92	8	30	9	105	18	0	0	229	1	552
7:15	2	57	81	4	60	28	106	31	1	1	249	1	621
7:30	5	48	70	11	52	23	123	24	1	1	214	6	578
7:45	0	79	62	9	56	22	121	55	1	2	244	5	656
HR TOTAL	10	241	305	32	198	82	455	128	3	4	936	13	2407
8:00 AM	1	65	70	4	41	26	128	46	1	4	220	5	611
8:15	5	57	50	8	39	33	127	61	0	10	179	7	576
8:30	3	55	54	8	59	36	72	72	3	8	166	9	545
8:45	4	98	53	14	51	45	42	72	3	7	128	2	519
HR TOTAL	13	275	227	34	190	140	369	251	7	29	693	23	2251
DAY TOTAL	35	649	771	91	470	249	1369	538	14	39	2496	52	6773

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:00 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	7:00 AM	0.91	10	241	305	556	2	43	55
East	8:00 AM	0.83	34	190	140	364	9	52	38
South	6:00 AM	0.92	545	159	4	708	77	22	1
West	7:00 AM	0.95	4	936	13	953	0	98	1
Entire Intersection									
North	7:15 AM	0.96	8	249	283	540	1	46	52
East		0.91	28	209	99	336	8	62	29
South		0.90	478	156	4	638	75	24	1
West		0.95	8	927	17	952	1	97	2

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 234
Weather : Fair

PAGE: 1
FILE: 29-234tm
DATE: 5/23/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
11:00 AM	2	57	16	10	77	36	46	61	9	11	31	3	359
11:15	4	46	27	10	82	33	28	58	7	13	30	1	339
11:30	1	58	14	12	72	44	41	55	5	11	34	1	348
11:45	0	55	26	11	69	25	41	44	10	9	36	1	327
HR TOTAL	7	216	83	43	300	138	156	218	31	44	131	6	1373
12:00 PM	3	46	14	9	85	38	48	81	8	6	42	3	383
12:15	1	52	11	7	95	35	52	65	11	13	37	5	384
12:30	1	68	20	6	128	37	46	57	4	6	52	2	427
12:45	6	70	15	14	150	36	37	52	9	1	36	2	428
HR TOTAL	11	236	60	36	458	146	183	255	32	26	167	12	1622
1:00 PM	0	55	12	11	145	36	31	70	9	9	37	2	417
1:15	2	55	11	12	177	51	31	64	12	5	28	1	449
DAY TOTAL	20	562	166	102	1080	371	401	607	84	84	363	21	3861

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	12:30 PM	0.87	9	248	58	315	3	79	18
East	12:30 PM	0.84	43	600	160	803	5	75	20
South	12:00 PM	0.86	183	255	32	470	39	54	7
West	11:45 AM	0.88	34	167	11	212	16	79	5
Entire Intersection									
North	12:30 PM	0.87	9	248	58	315	3	79	18
East		0.84	43	600	160	803	5	75	20
South		0.96	145	243	34	422	34	58	8
West		0.75	21	153	7	181	12	85	4

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 234
Weather : Fair

PAGE: 1
FILE: 29-234tp
DATE: 5/23/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
3:30	4	64	5	16	270	52	36	72	7	10	55	5	596
3:45	6	100	2	16	298	60	12	97	3	4	43	1	642
HR TOTAL	10	164	7	32	568	112	48	169	10	14	98	6	1238
4:00 PM	9	74	14	8	373	74	31	74	0	8	48	7	720
4:15	1	112	16	20	340	91	14	74	2	4	35	2	711
4:30	1	83	4	8	269	107	32	81	5	10	33	0	633
4:45	4	80	10	17	251	100	18	83	4	7	37	3	614
HR TOTAL	15	349	44	53	1233	372	95	312	11	29	153	12	2678
5:00 PM	1	91	5	17	206	93	45	101	6	5	60	1	631
5:15	0	124	13	18	240	94	19	99	4	13	49	3	676
5:30	1	109	5	17	268	103	37	98	4	9	46	4	701
5:45	3	128	2	10	207	127	15	126	5	18	42	2	685
HR TOTAL	5	452	25	62	921	417	116	424	19	45	197	10	2693
6:00 PM	3	110	1	12	202	129	56	83	1	8	43	3	651
6:15	2	101	3	25	184	106	21	85	10	9	20	1	567
DAY TOTAL	35	1176	80	184	3108	1136	336	1073	51	105	511	32	7827

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	5:15 PM	0.91	7	471	21	499	1	94	4
East	3:45 PM	0.91	52	1280	332	1664	3	77	20
South	5:00 PM	0.92	116	424	19	559	21	76	3
West	5:00 PM	0.95	45	197	10	252	18	78	4
Entire Intersection									
North	5:15 PM	0.91	7	471	21	499	1	94	4
East		0.92	57	917	453	1427	4	64	32
South		0.94	127	406	14	547	23	74	3
West		0.92	48	180	12	240	20	75	5

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 621
Weather : Fair

PAGE: 1
FILE: 29-621ta
DATE: 5/23/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
6:00 AM	2	0	2	1	33	2	10	1	2	2	390	1	446
6:15	1	0	2	2	44	2	12	1	2	3	396	2	467
6:30	2	0	2	1	52	2	13	1	2	4	370	2	451
6:45	6	0	3	6	45	3	16	2	2	6	394	1	484
HR TOTAL	11	0	9	10	174	9	51	5	8	15	1550	6	1848
7:00 AM	0	0	1	3	73	2	16	2	4	7	378	2	488
7:15	3	0	3	2	70	6	28	1	2	6	363	1	485
7:30	1	1	3	5	68	3	26	1	3	2	392	0	505
7:45	3	1	1	3	83	2	28	1	4	3	422	0	551
HR TOTAL	7	2	8	13	294	13	98	5	13	18	1555	3	2029
8:00 AM	3	2	1	3	55	6	20	0	2	2	400	2	496
8:15	1	0	2	8	77	3	19	1	4	4	391	4	514
8:30	0	1	0	8	94	2	6	1	5	5	284	1	407
8:45	1	0	4	11	107	1	7	0	2	1	229	0	363
HR TOTAL	5	3	7	30	333	12	52	2	13	12	1304	7	1780
DAY TOTAL	23	5	24	53	801	34	201	12	34	45	4409	16	5657

Break

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:15 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	7:15 AM	0.92	10	4	8	22	45	18	36
East	8:00 AM	0.79	30	333	12	375	8	89	3
South	7:00 AM	0.88	98	5	13	116	84	4	11
West	7:30 AM	0.95	11	1605	6	1622	1	99	0

Entire Intersection

North	7:30 AM	0.79	8	4	7	19	42	21	37
East		0.90	19	283	14	316	6	90	4
South		0.83	93	3	13	109	85	3	12
West		0.95	11	1605	6	1622	1	99	0

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 621
Weather : Fair

PAGE: 1
FILE: 29-621tm
DATE: 5/23/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
11:00 AM	2	0	6	7	164	11	4	0	4	6	99	3	306
11:15	6	0	1	6	80	11	3	0	9	1	89	3	209
11:30	1	1	8	12	115	8	2	0	3	1	97	4	252
11:45	1	1	4	9	139	2	3	1	4	2	102	1	269
HR TOTAL	10	2	19	34	498	32	12	1	20	10	387	11	1036
12:00 PM	1	1	9	16	94	3	2	0	3	6	99	2	236
12:15	5	0	9	10	117	9	6	0	3	5	109	3	276
12:30	2	0	4	11	109	4	11	0	4	7	90	1	243
12:45	1	0	1	7	114	4	3	0	0	3	91	0	224
HR TOTAL	9	1	23	44	434	20	22	0	10	21	389	6	979
1:00 PM	2	0	6	6	122	2	6	1	3	4	86	2	240
1:15	1	0	15	2	119	6	5	0	4	4	70	0	226
DAY TOTAL	22	3	63	86	1173	60	45	2	37	39	932	19	2481

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	11:30 AM	0.73	8	3	30	41	20	7	73
East	11:00 AM	0.77	34	498	32	564	6	88	6
South	11:45 AM	0.62	22	1	14	37	59	3	38
West	11:30 AM	0.92	14	407	10	431	3	94	2
Entire Intersection									
North	11:00 AM	0.77	10	2	19	31	32	6	61
East		0.77	34	498	32	564	6	88	6
South		0.69	12	1	20	33	36	3	61
West		0.94	10	387	11	408	2	95	3

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 621
Weather : Fair

PAGE: 1
FILE: 29-621tp
Movements by: Primary
DATE: 5/23/95

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
3:30	6	1	9	8	190	15	2	1	3	6	73	8	322
3:45	8	0	12	11	234	8	2	1	0	3	83	6	368
HR TOTAL	14	1	21	19	424	23	4	2	3	9	156	14	690
4:00 PM	2	1	9	12	281	16	11	1	1	4	79	1	418
4:15	1	2	5	4	287	11	1	0	1	3	76	4	395
4:30	2	2	7	7	294	17	11	0	1	4	76	0	421
4:45	2	2	6	5	302	16	3	1	3	6	58	1	405
HR TOTAL	7	7	27	28	1164	60	26	2	6	17	289	6	1639
5:00 PM	7	0	7	7	290	22	4	2	6	10	97	5	457
5:15	7	4	7	8	267	21	2	1	8	5	88	3	421
5:30	0	3	8	2	283	30	6	0	10	6	79	1	428
5:45	0	0	4	7	268	23	9	1	7	10	80	1	410
HR TOTAL	14	7	26	24	1108	96	21	4	31	31	344	10	1716
6:00 PM	0	0	8	9	265	18	17	1	7	2	83	3	413
6:15	0	0	10	6	270	18	2	0	5	3	66	1	381
DAY TOTAL	35	15	92	86	3231	215	70	9	52	62	938	34	4839

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	3:30 PM	0.70	17	4	35	56	30	7	62
East	4:15 PM	0.98	23	1173	66	1262	2	93	5
South	5:15 PM	0.69	34	3	32	69	49	4	46
West	5:00 PM	0.86	31	344	10	385	8	89	3
Entire Intersection									
North	5:00 PM	0.65	14	7	26	47	30	15	55
East		0.96	24	1108	96	1228	2	90	8
South		0.82	21	4	31	56	38	7	55
West		0.86	31	344	10	385	8	89	3

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 621
Weather : Fair

PAGE: 1
FILE: 29-621am
DATE: 5/20/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
6:00 AM	1	0	1	9	23	0	2	0	2	1	40	2	81
6:15	0	0	0	10	48	1	2	1	2	1	61	2	128
6:30	0	0	1	10	46	1	0	0	2	1	46	1	108
6:45	0	0	0	11	53	1	3	0	2	1	54	5	130
HR TOTAL	1	0	2	40	170	3	7	1	8	4	201	10	447
7:00 AM	0	0	3	17	68	3	1	0	1	5	59	4	161
7:15	1	0	1	24	57	1	2	0	6	5	66	1	164
7:30	1	0	1	20	68	0	2	1	2	1	68	2	166
7:45	1	0	3	13	74	1	4	1	0	2	81	2	182
HR TOTAL	3	0	8	74	267	5	9	2	9	13	274	9	673
8:00 AM	1	1	5	12	81	3	5	1	2	3	74	0	188
8:15	0	0	2	17	99	2	7	0	6	3	71	1	208
8:30	2	0	3	21	102	12	5	0	3	1	70	1	220
8:45	2	1	5	13	121	10	3	0	5	7	85	3	255
HR TOTAL	5	2	15	63	403	27	20	1	16	14	300	5	871
Break													
DAY TOTAL	9	2	25	177	840	35	36	4	33	31	775	24	1991

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:15 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	8:00 AM	0.69	5	2	15	22	23	9	68
East	8:00 AM	0.86	63	403	27	493	13	82	5
South	8:00 AM	0.71	20	1	16	37	54	3	43
West	8:00 AM	0.84	14	300	5	319	4	94	2

Entire Intersection

North	8:00 AM	0.69	5	2	15	22	23	9	68
East		0.86	63	403	27	493	13	82	5
South		0.71	20	1	16	37	54	3	43
West		0.84	14	300	5	319	4	94	2

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 621
Weather : Fair

PAGE: 1
FILE: 29-621mm
Movements by: Primary
DATE: 5/20/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
11:00 AM	3	0	5	17	163	18	13	1	3	6	93	3	325
11:15	0	0	2	10	185	16	6	1	4	2	98	4	328
11:30	2	0	8	23	184	18	11	0	5	4	87	4	346
11:45	3	0	7	20	147	22	11	0	5	11	93	3	322
HR TOTAL	8	0	22	70	679	74	41	2	17	23	371	14	1321
12:00 PM	6	1	7	16	148	21	10	2	5	4	103	2	325
12:15	0	0	11	22	161	16	30	1	10	11	82	4	348
12:30	5	1	10	36	155	18	36	4	7	9	125	9	415
12:45	1	0	15	26	134	17	17	1	7	7	101	8	334
HR TOTAL	12	2	43	100	598	72	93	8	29	31	411	23	1422
1:00 PM	3	4	20	26	152	28	2	2	9	6	104	4	360
1:15	2	1	18	32	160	16	6	3	8	6	103	5	360
DAY TOTAL	25	7	103	228	1589	190	142	15	63	66	989	46	3463

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION	START	PEAK HR	..... VOLUMES				.... PERCENTS ...		
FROM	PEAK HOUR	FACTOR	Right	Thru	Left	Total	Right	Thru	Left
North	12:30 PM	0.74	11	6	63	80	14	8	79
East	11:00 AM	0.91	70	679	74	823	9	83	9
South	12:00 PM	0.69	93	8	29	130	72	6	22
West	12:30 PM	0.85	28	433	26	487	6	89	5
Entire Intersection									
North	12:30 PM	0.74	11	6	63	80	14	8	79
East		0.96	120	601	79	800	15	75	10
South		0.54	61	10	31	102	60	10	30
West		0.85	28	433	26	487	6	89	5

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 621
Weather : Fair

PAGE: 1
FILE: 29-621pm
DATE: 5/20/95

Movements by: Primary

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
3:30	1	4	19	9	137	7	8	0	6	7	122	2	322
3:45	2	3	15	6	153	12	18	1	5	5	118	1	339
HR TOTAL	3	7	34	15	290	19	26	1	11	12	240	3	661
4:00 PM	1	2	18	7	132	16	17	0	4	8	105	4	314
4:15	6	1	27	7	126	17	8	2	6	7	97	3	307
4:30	3	0	38	3	113	9	14	0	2	3	121	0	306
4:45	2	2	34	4	127	9	15	0	6	5	149	1	354
HR TOTAL	12	5	117	21	498	51	54	2	18	23	472	8	1281
5:00 PM	3	2	33	5	114	14	12	0	2	7	102	0	294
5:15	1	1	35	8	112	12	8	3	8	7	102	2	299
5:30	1	0	37	7	95	14	15	2	4	1	109	1	286
5:45	3	1	39	1	111	12	13	2	7	3	101	0	293
HR TOTAL	8	4	144	21	432	52	48	7	21	18	414	3	1172
6:00 PM	1	0	40	6	104	15	13	1	8	4	92	1	285
6:15	2	1	31	7	111	8	11	1	2	3	88	1	266
DAY TOTAL	26	17	366	70	1435	145	152	12	60	60	1306	16	3665

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	5:15 PM	0.92	6	2	151	159	4	1	95
East	3:30 PM	0.92	29	548	52	629	5	87	8
South	5:15 PM	0.95	49	8	27	84	58	10	32
West	4:00 PM	0.81	23	472	8	503	5	94	2
Entire Intersection									
North	3:30 PM	0.73	10	10	79	99	10	10	80
East		0.92	29	548	52	629	5	87	8
South		0.78	51	3	21	75	68	4	28
West		0.91	27	442	10	479	6	92	2

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 705
Weather : Fair

PAGE: 1
FILE: 29-705am

Movements by: Primary

DATE: 5/20/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
6:00 AM	0	0	0	0	12	0	1	0	0	1	27	0	41
6:15	0	0	0	0	19	1	1	0	1	2	48	1	73
6:30	0	1	0	0	19	0	3	2	0	6	47	0	78
6:45	0	0	0	0	28	1	1	0	0	3	34	0	67
HR TOTAL	0	1	0	0	78	2	6	2	1	12	156	1	259
7:00 AM	0	0	0	0	48	2	2	0	6	1	35	0	94
7:15	0	0	1	0	52	2	3	0	2	1	35	0	96
7:30	0	0	2	0	64	3	0	0	2	0	62	0	133
7:45	1	0	0	1	39	0	0	0	0	3	40	0	84
HR TOTAL	1	0	3	1	203	7	5	0	10	5	172	0	407
8:00 AM	2	0	0	1	56	4	2	0	2	2	33	0	102
8:15	0	1	0	0	60	1	4	1	4	0	47	0	118
8:30	0	1	1	0	57	1	3	0	0	0	64	1	128
8:45	0	2	1	2	95	0	1	0	1	2	66	0	170
HR TOTAL	2	4	2	3	268	6	10	1	7	4	210	1	518
DAY TOTAL	3	5	5	4	549	15	21	3	18	21	538	2	1184

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:00 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	8:00 AM	0.67	2	4	2	8	25	50	25
East	8:00 AM	0.71	3	268	6	277	1	97	2
South	6:30 AM	0.59	9	2	8	19	47	11	42
West	8:00 AM	0.79	4	210	1	215	2	98	0

Entire Intersection

North	8:00 AM	0.67	2	4	2	8	25	50	25
East		0.71	3	268	6	277	1	97	2
South		0.50	10	1	7	18	56	6	39
West		0.79	4	210	1	215	2	98	0

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 705
Weather : Fair

PAGE: 1
FILE: 29-705ms
DATE: 5/20/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
11:00 AM	1	0	1	1	149	2	2	2	4	1	58	1	222
11:15	4	0	1	5	150	0	1	0	2	1	55	1	220
11:30	0	0	0	1	127	4	1	0	9	4	50	0	196
11:45	1	0	2	0	129	3	3	2	4	2	39	2	187
HR TOTAL	6	0	4	7	555	9	7	4	19	8	202	4	825
12:00 PM	0	0	1	2	124	3	3	0	1	2	54	1	191
12:15	0	0	0	0	107	3	1	0	2	4	57	0	174
12:30	0	0	1	3	153	4	4	2	1	2	79	3	252
12:45	0	0	0	0	122	4	2	0	4	3	68	1	204
HR TOTAL	0	0	2	5	506	14	10	2	8	11	258	5	821
1:00 PM	0	0	1	2	126	9	2	1	5	3	60	1	210
1:15	0	0	2	1	120	8	4	1	3	7	52	0	198
DAY TOTAL	6	0	9	15	1307	40	23	8	35	29	572	10	2054

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	11:00 AM	0.50	6	0	4	10	60	0	40
East	11:00 AM	0.92	7	555	9	571	1	97	2
South	11:00 AM	0.75	7	4	19	30	23	13	63
West	12:15 PM	0.84	12	264	5	281	4	94	2
Entire Intersection									
North	12:30 PM	0.50	0	0	4	4	0	0	%100
East		0.86	6	521	25	552	1	94	5
South		0.91	12	4	13	29	41	14	45
West		0.83	15	259	5	279	5	93	2

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 705
Weather : Fair

PAGE: 1
FILE: 29-705pm
Movements by: Primary
DATE: 5/20/95

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
3:30	0	3	1	3	94	5	1	0	2	1	60	0	170
3:45	0	0	1	1	88	1	1	0	3	1	62	0	158
HR TOTAL	0	3	2	4	182	6	2	0	5	2	122	0	328
4:00 PM	0	0	3	2	94	2	3	0	3	7	65	0	179
4:15	0	0	1	1	100	2	4	2	1	2	68	1	182
4:30	2	1	1	2	84	2	3	0	2	1	72	1	171
4:45	1	0	0	1	80	2	5	0	6	2	79	0	176
HR TOTAL	3	1	5	6	358	8	15	2	12	12	284	2	708
5:00 PM	2	0	1	1	59	5	7	0	3	2	62	0	142
5:15	0	0	0	0	85	2	8	1	7	5	45	1	154
5:30	0	0	2	2	79	1	1	1	2	6	64	0	158
5:45	0	1	1	2	60	1	0	1	0	3	45	0	114
HR TOTAL	2	1	4	5	283	9	16	3	12	16	216	1	568
6:00 PM	0	1	1	0	49	3	2	1	1	1	59	0	118
6:15	2	0	0	0	62	1	0	0	3	3	53	0	124
DAY TOTAL	7	6	12	15	934	27	35	6	33	34	734	3	1846

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	3:30 PM	0.56	0	3	6	9	0	33	67
East	3:30 PM	0.95	7	376	10	393	2	96	3
South	4:30 PM	0.66	23	1	18	42	55	2	43
West	4:00 PM	0.92	12	284	2	298	4	95	1

Entire Intersection

North	4:00 PM	0.56	3	1	5	9	33	11	56
East		0.90	6	358	8	372	2	96	2
South		0.66	15	2	12	29	52	7	41
West		0.92	12	284	2	298	4	95	1

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 705
Weather : Clear

PAGE: 1
FILE: 29-705ta
Movements by: Primary
DATE: 5/23/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
6:00 AM	1	0	0	4	14	1	1	0	0	1	289	31	342
6:15	1	0	0	6	27	0	0	1	1	2	317	42	397
6:30	0	0	0	8	21	1	0	2	1	3	252	68	356
6:45	4	2	0	22	25	1	0	0	0	2	214	56	326
HR TOTAL	6	2	0	40	87	3	1	3	2	8	1072	197	1421
7:00 AM	7	9	2	15	27	2	0	0	1	1	214	67	345
7:15	4	2	2	8	30	0	1	1	1	2	204	63	318
7:30	7	2	2	8	24	0	0	1	1	1	160	45	251
7:45	6	0	4	1	48	0	0	1	1	1	204	34	300
HR TOTAL	24	13	10	32	129	2	1	3	4	5	782	209	1214
8:00 AM	5	0	6	4	37	2	0	0	0	0	176	27	257
8:15	7	1	4	0	45	0	1	0	0	0	161	16	235
8:30	2	1	4	2	42	1	0	1	0	0	194	7	254
8:45	7	0	2	1	49	1	2	0	1	0	144	7	214
HR TOTAL	21	2	16	7	173	4	3	1	1	0	675	57	960
DAY TOTAL	51	17	26	79	389	9	5	7	7	13	2529	463	3595

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:00 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	7:00 AM	0.65	24	13	10	47	51	28	21
East	8:00 AM	0.90	7	173	4	184	4	94	2
South	7:00 AM	0.67	1	3	4	8	12	38	50
West	6:00 AM	0.88	8	1072	197	1277	1	84	15
Entire Intersection									
North	6:15 AM	0.35	12	11	2	25	48	44	8
East		0.81	51	100	4	155	33	65	3
South		0.50	0	3	3	6	0	50	50
West		0.86	8	997	233	1238	1	81	19

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 705
Weather : Sunny

PAGE: 1
FILE: 29-705tm
DATE: 5/23/95

Movements by: Primary

Time Begin	From North RT	THRU	LT	From East RT	THRU	LT	From South RT	THRU	LT	From West RT	THRU	LT	Vehicle Total
11:00 AM	8	1	1	0	60	0	0	0	0	0	44	4	118
11:15	6	0	2	1	68	2	1	0	0	0	61	3	144
11:30	4	2	0	0	45	0	0	0	0	0	60	6	117
11:45	5	1	1	1	57	0	1	0	2	1	47	7	123
HR TOTAL	23	4	4	2	230	2	2	0	2	1	212	20	502
12:00 PM	0	1	1	2	51	0	1	0	1	0	59	1	117
12:15	4	1	1	3	62	1	0	0	0	2	62	7	143
12:30	7	0	3	1	49	1	0	0	1	2	56	5	125
12:45	1	0	3	0	50	0	2	0	0	1	33	1	91
HR TOTAL	12	2	8	6	212	2	3	0	2	5	210	14	476
1:00 PM	4	1	0	1	57	1	0	1	0	0	57	1	123
1:15	6	1	1	2	63	2	1	1	0	0	38	2	117
DAY TOTAL	45	8	13	11	562	7	6	2	4	6	517	37	1218

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	11:00 AM	0.77	23	4	4	31	74	13	13
East	11:00 AM	0.82	2	230	2	234	1	98	1
South	11:15 AM	0.50	3	0	3	6	50	0	50
West	11:30 AM	0.89	3	228	21	252	1	90	8
Entire Intersection									
North	11:45 AM	0.63	16	3	6	25	64	12	24
East		0.86	7	219	2	228	3	96	1
South		0.50	2	0	4	6	33	0	67
West		0.88	5	224	20	249	2	90	8

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 705
Weather : Sunny

PAGE: 1
FILE: 29-705tp
DATE: 5/23/95

Movements by: Primary

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
3:30	4	0	10	1	135	0	2	1	0	0	54	7	214
3:45	3	2	13	3	152	1	1	0	1	1	50	10	237
HR TOTAL	7	2	23	4	287	1	3	1	1	1	104	17	451
4:00 PM	9	2	1	3	162	0	1	1	1	0	50	2	232
4:15	20	0	2	2	179	1	0	3	1	1	44	4	257
4:30	17	1	3	5	170	0	0	1	0	1	31	10	239
4:45	18	2	3	6	199	0	0	3	3	1	37	10	282
HR TOTAL	64	5	9	16	710	1	1	8	5	3	162	26	1010
5:00 PM	29	0	3	6	198	0	1	3	1	4	48	5	298
5:15	32	1	1	8	190	0	1	1	1	1	52	5	293
5:30	44	0	1	4	194	0	0	1	2	1	45	7	299
5:45	45	1	2	7	169	0	0	0	0	0	59	4	287
HR TOTAL	150	2	7	25	751	0	2	5	4	6	204	21	1177
6:00 PM	30	0	2	5	162	0	0	0	1	0	47	4	251
6:15	31	0	1	4	156	0	0	0	0	0	27	1	220
DAY TOTAL	282	9	42	54	2066	2	6	14	11	10	544	69	3109

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	5:00 PM	0.83	150	2	7	159	94	1	4
East	4:45 PM	0.98	24	781	0	805	3	97	0
South	4:45 PM	0.71	2	8	7	17	12	47	41
West	5:00 PM	0.92	6	204	21	231	3	88	9
Entire Intersection									
North	5:00 PM	0.83	150	2	7	159	94	1	4
East		0.95	25	751	0	776	3	97	0
South		0.55	2	5	4	11	18	45	36
West		0.92	6	204	21	231	3	88	9

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 622
Weather : Fair

PAGE: 1
FILE: 29-622am
Movements by: Primary
DATE: 5/20/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
6:00 AM	1	1	2	1	12	0	0	0	0	0	30	2	49
6:15	1	0	1	0	21	0	0	0	0	0	34	2	59
6:30	1	1	2	0	14	1	0	0	0	1	39	4	63
6:45	1	0	4	1	26	0	0	1	1	0	34	9	77
HR TOTAL	4	2	9	2	73	1	0	1	1	1	137	17	248
7:00 AM	1	0	4	2	41	0	1	0	0	0	26	4	79
7:15	2	0	8	0	44	0	0	0	0	0	36	4	94
7:30	2	1	4	0	52	0	1	0	0	0	46	8	114
7:45	1	0	1	0	46	0	0	0	0	1	45	3	97
HR TOTAL	6	1	17	2	183	0	2	0	0	1	153	19	384
8:00 AM	2	0	9	4	37	1	0	0	0	0	43	1	97
8:15	0	0	4	3	49	0	1	1	0	1	42	3	104
8:30	0	1	7	4	52	0	0	0	0	0	46	7	117
8:45	4	0	3	3	88	0	0	0	0	0	61	5	164
HR TOTAL	6	1	23	14	226	1	1	1	0	1	192	16	482
DAY TOTAL	16	4	49	18	482	2	3	2	1	3	482	52	1114

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:00 AM

DIRECTION	START	PEAK HR	..... VOLUMES				.... PERCENTS ...		
FROM	PEAK HOUR	FACTOR	Right	Thru	Left	Total	Right	Thru	Left
North	7:15 AM	0.68	7	1	22	30	23	3	73
East	8:00 AM	0.66	14	226	1	241	6	94	0
South	6:45 AM	0.50	2	1	1	4	50	25	25
West	8:00 AM	0.79	1	192	16	209	0	92	8
Entire Intersection									
North	8:00 AM	0.68	6	1	23	30	20	3	77
East		0.66	14	226	1	241	6	94	0
South		0.25	1	1	0	2	50	50	0
West		0.79	1	192	16	209	0	92	8

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 622
Weather :

PAGE: 1
FILE: 29-622mm

Movements by: Primary

DATE: 5/20/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
11:00 AM	2	1	3	2	128	0	0	0	0	0	54	9	199
11:15	3	0	2	5	146	0	0	2	0	0	52	3	213
11:30	8	1	4	6	103	1	0	0	0	0	39	2	164
11:45	7	0	1	6	120	3	0	1	1	1	39	3	182
HR TOTAL	20	2	10	19	497	4	0	3	1	1	184	17	758
12:00 PM	4	0	3	2	107	1	0	0	0	2	56	2	177
12:15	7	0	3	4	106	0	0	0	0	2	56	2	180
12:30	5	1	2	4	142	0	0	1	0	1	70	6	232
12:45	5	0	5	5	111	1	0	1	0	0	60	3	191
HR TOTAL	21	1	13	15	466	2	0	2	0	5	242	13	780
1:00 PM	4	0	10	1	127	0	0	0	0	1	44	1	188
1:15	2	0	4	2	123	1	1	0	0	0	66	4	203
DAY TOTAL	47	3	37	37	1213	7	1	5	1	7	536	35	1929

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION	START	PEAK HR	..... VOLUMES				.... PERCENTS ...		
FROM	PEAK HOUR	FACTOR	Right	Thru	Left	Total	Right	Thru	Left
North	12:15 PM	0.75	21	1	20	42	50	2	48
East	11:00 AM	0.86	19	497	4	520	4	96	1
South	11:00 AM	0.50	0	3	1	4	0	75	25
West	12:00 PM	0.84	5	242	13	260	2	93	5
Entire Intersection									
North	12:30 PM	0.68	16	1	21	38	42	3	55
East		0.89	12	503	2	517	2	97	0
South		0.75	1	2	0	3	33	67	0
West		0.83	2	240	14	256	1	94	5

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 622
Weather : Fair

PAGE: 1
FILE: 29-622pm
DATE: 5/20/95

Movements by: Primary

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
3:30	7	0	2	1	84	0	0	0	0	0	57	2	153
3:45	4	0	0	2	83	0	0	0	0	0	53	5	147
HR TOTAL	11	0	2	3	167	0	0	0	0	0	110	7	300
4:00 PM	7	0	4	0	79	0	0	0	0	0	68	7	165
4:15	5	0	2	3	82	1	0	0	1	0	54	9	157
4:30	3	1	1	1	76	0	2	0	0	0	59	6	149
4:45	8	0	3	4	77	1	0	0	0	0	68	5	166
HR TOTAL	23	1	10	8	314	2	2	0	1	0	249	27	637
5:00 PM	6	0	3	2	70	0	1	1	2	3	66	4	158
5:15	6	0	3	1	82	0	0	1	1	1	75	1	171
5:30	5	0	2	3	71	1	0	0	1	0	70	2	155
5:45	7	1	3	1	56	0	1	0	1	1	52	3	126
HR TOTAL	24	1	11	7	279	1	2	2	5	5	263	10	610
6:00 PM	4	1	1	0	61	3	1	1	2	3	61	1	139
6:15	4	1	1	3	44	0	1	1	2	1	56	2	116
DAY TOTAL	66	4	25	21	865	6	6	4	10	9	739	47	1802

PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

DIRECTION	START	PEAK HR	..... VOLUMES				.... PERCENTS ...		
FROM	PEAK HOUR	FACTOR	Right	Thru	Left	Total	Right	Thru	Left
North	4:45 PM	0.82	25	0	11	36	69	0	31
East	3:30 PM	0.97	6	328	1	335	2	98	0
South	5:30 PM	0.69	3	2	6	11	27	18	55
West	4:45 PM	0.96	4	279	12	295	1	95	4

Entire Intersection

North	4:45 PM	0.82	25	0	11	36	69	0	31
East		0.94	10	300	2	312	3	96	1
South		0.44	1	2	4	7	14	29	57
West		0.96	4	279	12	295	1	95	4

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 622
Weather : Fair

Movements by: Primary

PAGE: 1
FILE: 29-622ta
DATE: 5/23/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
6:00 AM	1	0	0	0	9	1	14	9	2	1	290	1	328
6:15	0	0	0	1	18	1	22	12	2	1	312	2	371
6:30	0	0	0	0	15	0	34	17	2	1	236	1	306
6:45	0	1	0	0	24	2	17	16	10	2	190	4	266
HR TOTAL	1	1	0	1	66	4	87	54	16	5	1028	8	1271
7:00 AM	0	1	0	0	10	0	19	11	6	2	199	3	251
7:15	1	1	0	0	30	2	25	9	5	2	202	5	282
7:30	0	0	0	0	23	8	31	15	2	6	199	5	289
7:45	0	3	0	0	20	6	19	11	3	13	192	4	271
HR TOTAL	1	5	0	0	83	16	94	46	16	23	792	17	1093
8:00 AM	0	1	0	2	28	3	12	6	4	4	186	4	250
8:15	0	0	0	0	23	8	11	0	0	9	164	0	215
8:30	1	1	0	0	28	5	7	2	5	6	177	1	233
8:45	0	2	2	0	32	5	8	0	0	5	126	1	181
HR TOTAL	1	4	2	2	111	21	38	8	9	24	653	6	879
DAY TOTAL	3	10	2	3	260	41	219	108	41	52	2473	31	3243

PEAK PERIOD ANALYSIS FOR THE PERIOD: 6:00 AM - 9:00 AM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	8:00 AM	0.44	1	4	2	7	14	57	29
East	8:00 AM	0.91	2	111	21	134	1	83	16
South	6:30 AM	0.81	95	53	23	171	56	31	13
West	6:00 AM	0.83	5	1028	8	1041	0	99	1
Entire Intersection									
North	6:00 AM	0.50	1	1	0	2	50	50	0
East		0.68	1	66	4	71	1	93	6
South		0.74	87	54	16	157	55	34	10
West		0.83	5	1028	8	1041	0	99	1

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 622
Weather : Fair

Movements by: Primary

PAGE: 1
FILE: 29-622tm
DATE: 5/23/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
11:00 AM	0	1	2	0	52	1	4	3	0	3	37	0	103
11:15	1	0	1	0	58	3	3	0	2	3	60	0	131
11:30	1	2	3	0	40	1	2	0	3	4	42	0	98
11:45	1	0	1	0	45	1	2	1	1	4	39	0	95
HR TOTAL	3	3	7	0	195	6	11	4	6	14	178	0	427
12:00 PM	2	0	0	3	48	1	6	0	5	3	44	0	112
12:15	1	0	1	1	61	3	2	3	5	1	52	0	130
12:30	0	0	1	1	47	5	2	1	7	8	57	1	130
12:45	0	4	0	0	53	2	2	1	7	3	29	0	101
HR TOTAL	3	4	2	5	209	11	12	5	24	15	182	1	473
1:00 PM	0	0	0	1	60	3	1	3	1	2	46	0	117
1:15	0	0	0	0	61	3	3	3	0	7	25	2	104
DAY TOTAL	6	7	9	6	525	23	27	15	31	38	431	3	1121

PEAK PERIOD ANALYSIS FOR THE PERIOD: 11:00 AM - 1:30 PM

DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	11:00 AM	0.54	3	3	7	13	23	23	54
East	12:15 PM	0.91	3	221	13	237	1	93	5
South	12:00 PM	0.93	12	5	24	41	29	12	59
West	11:45 AM	0.79	16	192	1	209	8	92	0
Entire Intersection									
North	12:15 PM	0.44	1	4	2	7	14	57	29
East		0.91	3	221	13	237	1	93	5
South		0.88	7	8	20	35	20	23	57
West		0.75	14	184	1	199	7	92	1

TRAFFIC DATA SERVICE

Site Code : Manassas, VA
N-S Street: US Rte 29
E-W Street: VA Rte 622
Weather : Fair

PAGE: 1
FILE: 29-622tp

Movements by: Primary

DATE: 5/23/95

Time	From North			From East			From South			From West			Vehicle
Begin	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	Total
3:30	1	0	0	0	124	10	3	0	4	3	60	1	206
3:45	2	5	1	0	149	4	0	2	0	1	42	4	210
HR TOTAL	3	5	1	0	273	14	3	2	4	4	102	5	416
4:00 PM	1	3	1	1	164	10	6	1	15	2	42	1	247
4:15	2	2	1	0	125	10	3	0	11	4	38	1	197
4:30	2	1	1	0	120	2	2	0	14	2	27	1	172
4:45	3	6	0	0	165	4	6	0	9	3	34	3	233
HR TOTAL	8	12	3	1	574	26	17	1	49	11	141	6	849
5:00 PM	0	3	1	1	159	15	9	0	17	1	52	1	259
5:15	2	3	2	2	154	10	5	2	14	7	45	0	246
5:30	0	5	3	3	145	11	9	3	9	2	51	0	241
5:45	1	1	1	0	130	8	3	1	7	3	54	0	209
HR TOTAL	3	12	7	6	588	44	26	6	47	13	202	1	955
6:00 PM	1	1	4	0	98	12	5	2	6	4	47	0	180
6:15	1	0	0	1	104	8	2	2	10	1	32	0	161
DAY TOTAL	16	30	15	8	1637	104	53	13	116	33	524	12	2561

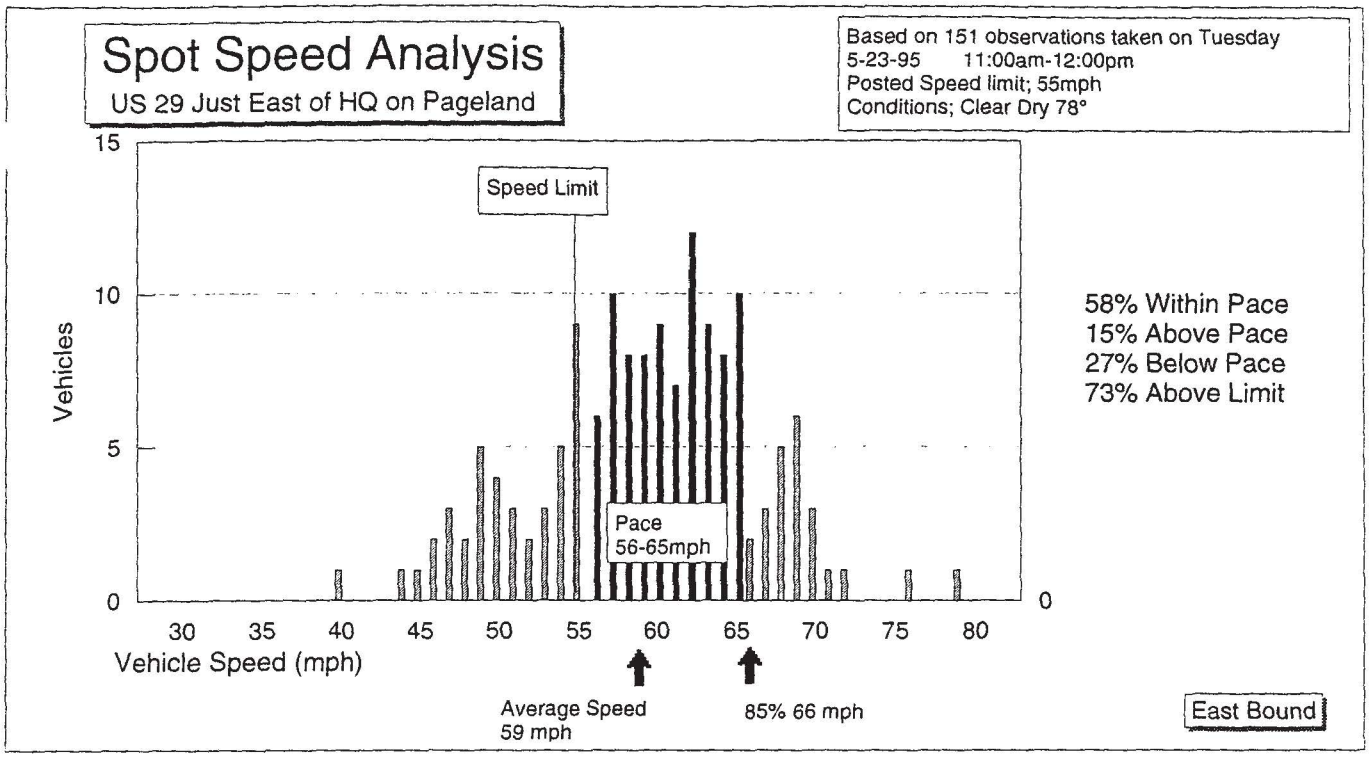
PEAK PERIOD ANALYSIS FOR THE PERIOD: 3:30 PM - 6:30 PM

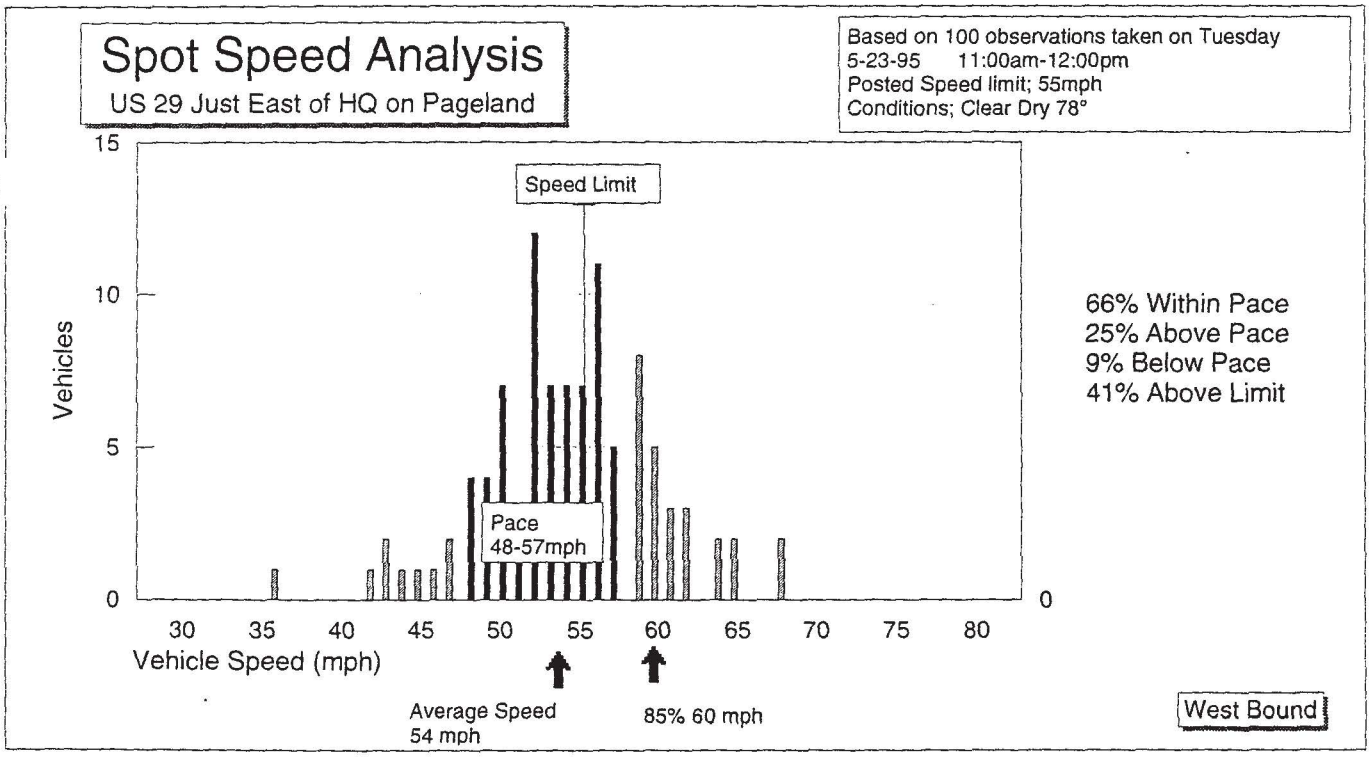
DIRECTION FROM	START PEAK HOUR	PEAK HR FACTOR	VOLUMES Right	Thru	Left	Total	PERCENTS Right	Thru	Left
North	4:45 PM	0.78	5	17	6	28	18	61	21
East	4:45 PM	0.96	6	623	40	669	1	93	6
South	4:45 PM	0.80	29	5	49	83	35	6	59
West	5:00 PM	0.95	13	202	1	216	6	94	0

Entire Intersection

North	4:45 PM	0.78	5	17	6	28	18	61	21
East		0.96	6	623	40	669	1	93	6
South		0.80	29	5	49	83	35	6	59
West		0.92	13	182	4	199	7	91	2

Appendix C - Spot Speed Data

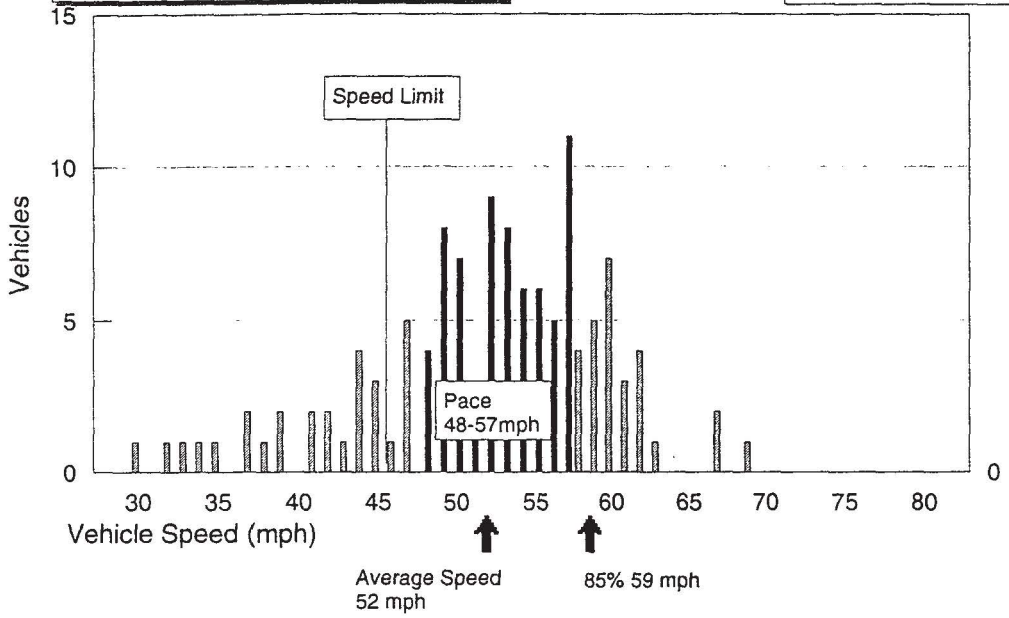

Spot Speed Analysis
US 29 Just East of HQ on Pageland
Based on 151 observations taken on Tuesday
5-23-95 11:00am-12:00pm
Posted Speed limit; 55mph
Conditions; Clear Dry 78°
Speed Limit
Pace
56-65mph
Vehicles
Vehicle Speed (mph)
58% Within Pace
15% Above Pace
27% Below Pace
73% Above Limit
Average Speed
59 mph
85% 66 mph
East Bound


Spot Speed Analysis
US 29 Just East of HQ on Pageland
Based on 100 observations taken on Tuesday
5-23-95 11:00am-12:00pm
Posted Speed limit; 55mph
Conditions; Clear Dry 78°
Speed Limit
Pace
48-57mph
Vehicles
Vehicle Speed (mph)
66% Within Pace
25% Above Pace
9% Below Pace
41% Above Limit
Average Speed
54 mph
85% 60 mph
West Bound

Spot Speed Analysis

HWY 29 at New York Monument

Based on 122 observations taken on Monday
5-22-95 11:00am-12:00noon
Posted Speed limit; 45 mph
Conditions; Clear Dry 80°



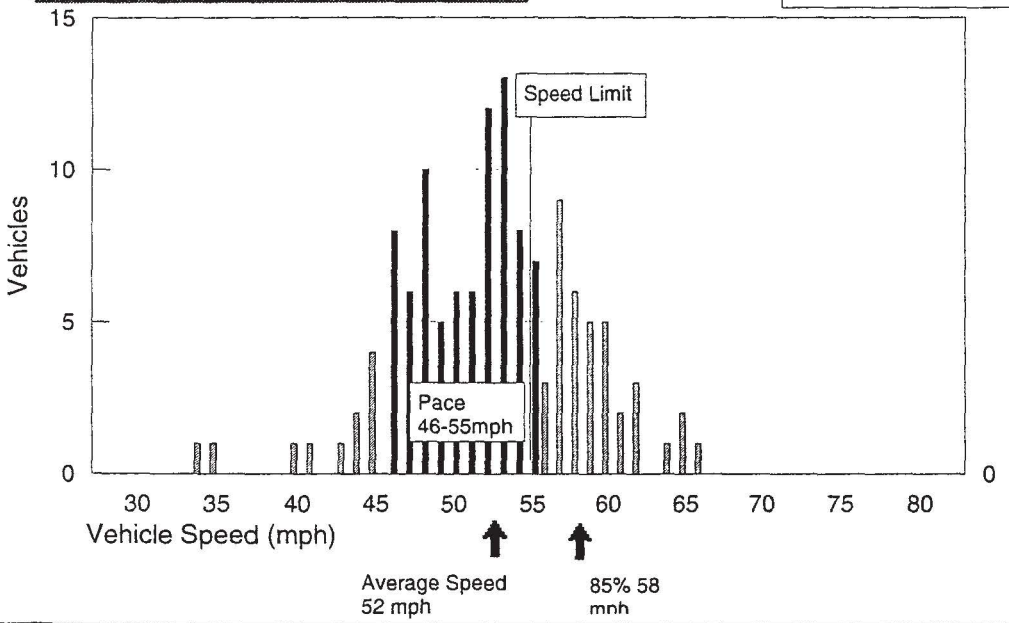
55% Within Pace
22% Above Pace
23% Below Pace
82% Above Limit

East Bound

Spot Speed Analysis

HWY 29 at New York Monument

Based on 129 observations taken on Monday
5-22-95 11:00am-12:00noon
Posted Speed limit; 55 mph
Conditions; Clear Dry 80°



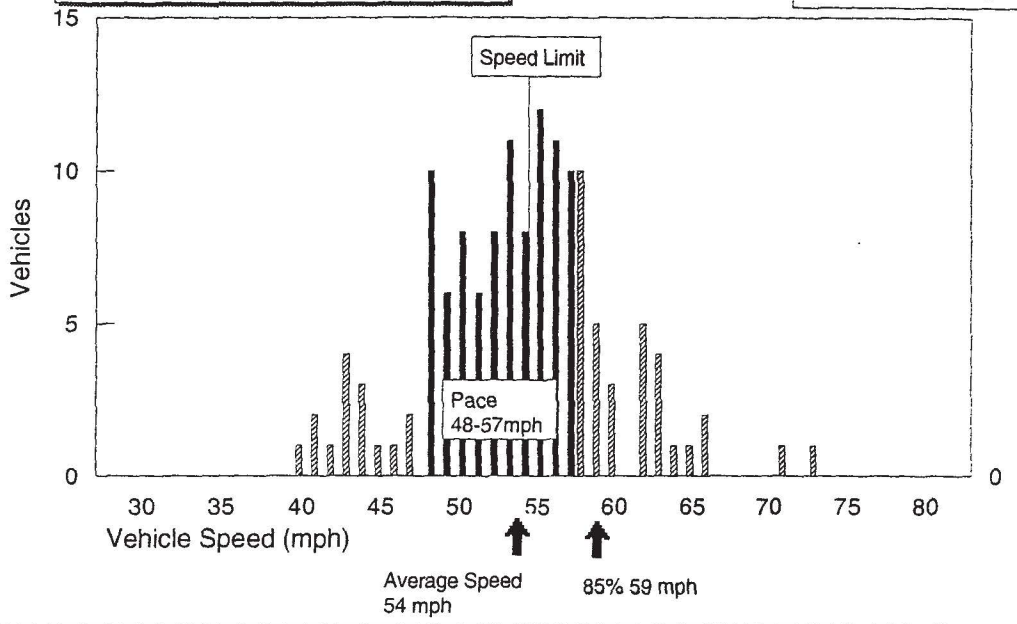
63% Within Pace
29% Above Pace
9% Below Pace
29% Above Limit

West Bound

Spot Speed Analysis

US 29 at Youngs Branch Pullout

Based on 138 observations taken on Monday
5-22-95 1:15-2:15 pm
Posted Speed limit; 55 mph
Conditions; Clear Dry 83°



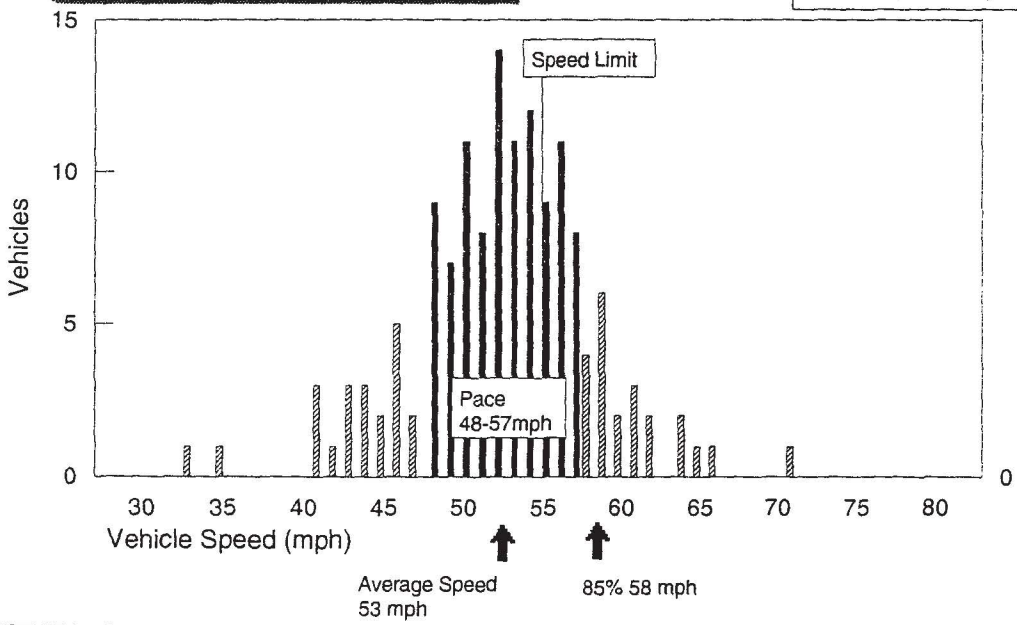
65% Within Pace
24% Above Pace
11% Below Pace
38% Above Limit

East Bound

Spot Speed Analysis

US 29 at Youngs Branch Pullout

Based on 143 observations taken on Monday
5-22-95 1:15-2:15
Posted Speed limit; 55 mph
Conditions; Clear Dry 83°

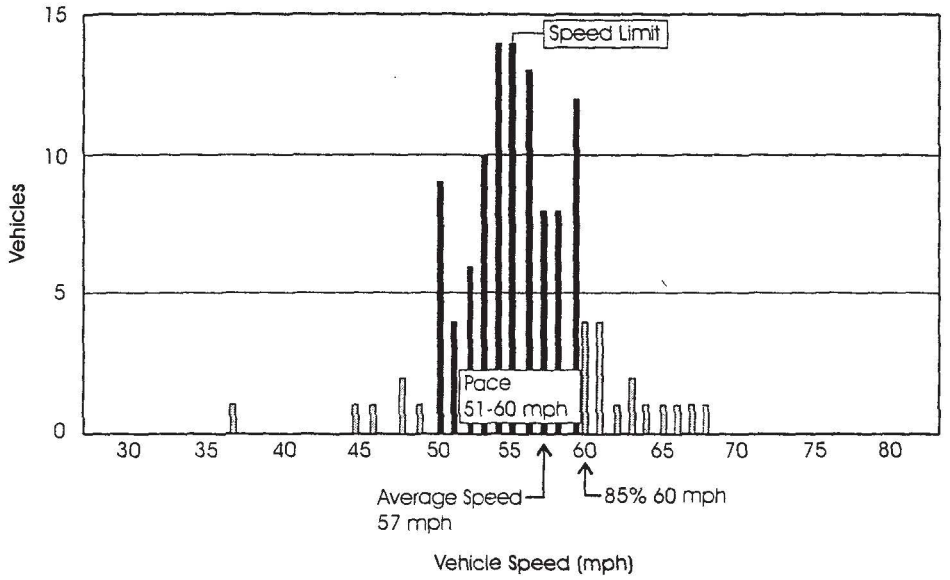


70% Within Pace
15% Above Pace
15% Below Pace
29% Above Limit

West Bound

Spot Speed Analysis
US 29 at Stone Bridge (Eastbound)

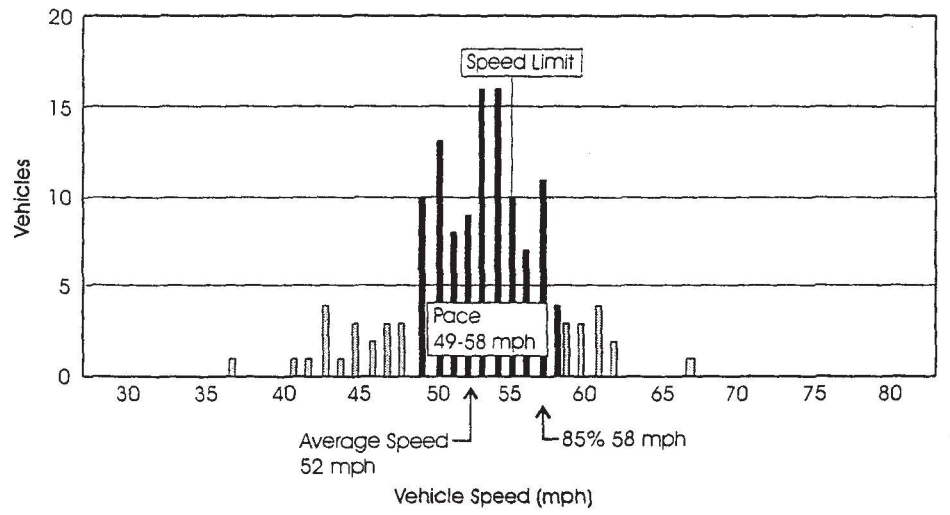
Based on 120 observations taken Sunday
7/9/95 8:50 - 9:40 AM
Posted Speed Limit: 55 mph
Conditions: Sunny



82% Within Pace
13% Above Pace
5% Below Pace
48% Above Limit

Spot Speed Analysis
US 29 at Stone Bridge (Westbound)

Based on 136 observations taken Sunday
7/9/95 8:50 - 9:40 AM
Posted Speed Limit: 55 mph
Conditions: Sunny

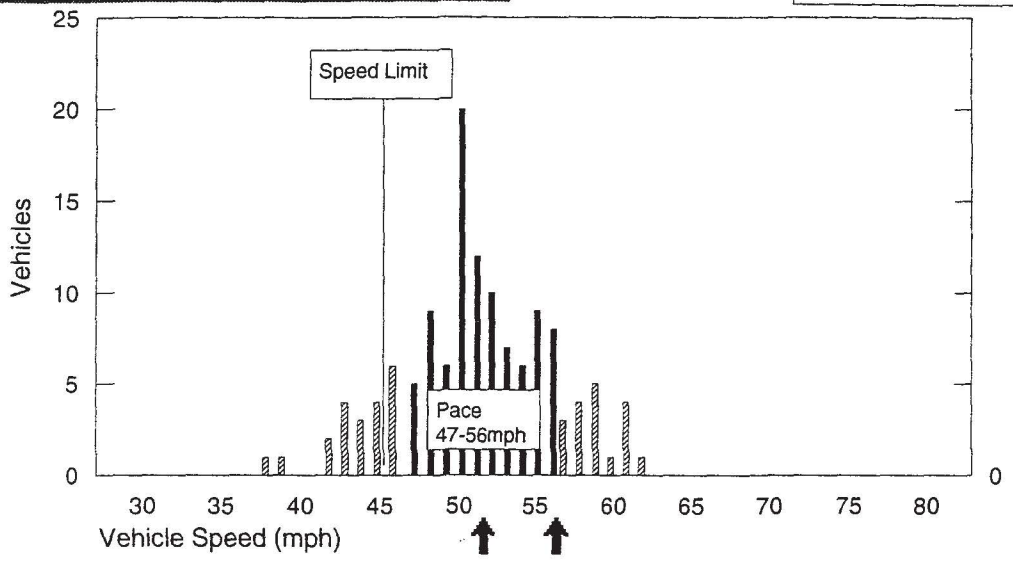


76% Within Pace
10% Above Pace
14% Below Pace
69% Above Limit

Spot Speed Analysis

VA 234 in front of V.C.

Based on 131 observations taken on Tuesday
5-23-95 12:15-1:15pm
Posted Speed limit; 45 mph
Conditions; Clear Dry 78°



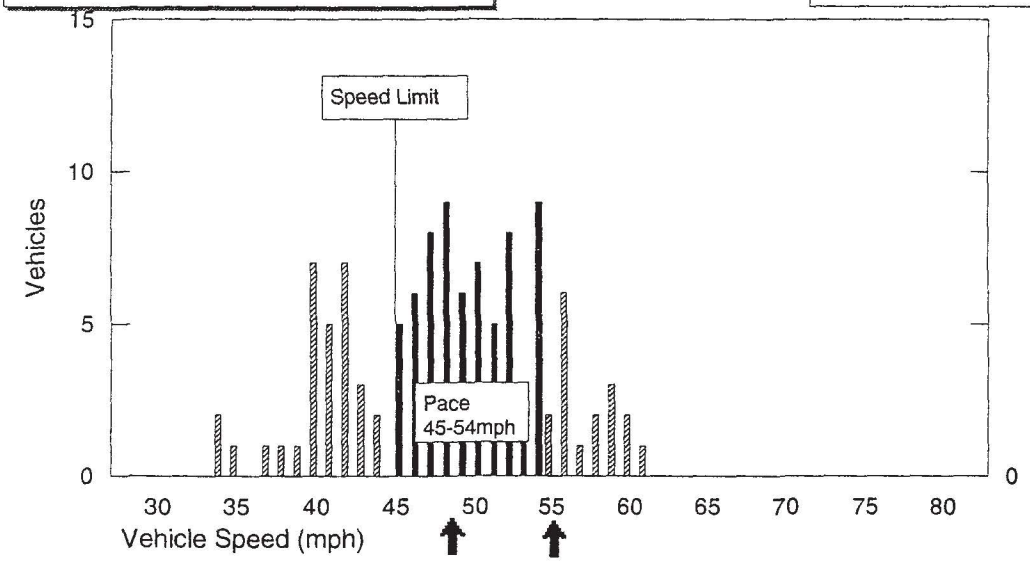
70% Within Pace
14% Above Pace
16% Below Pace
89% Above Limit

South Bound

Spot Speed Analysis

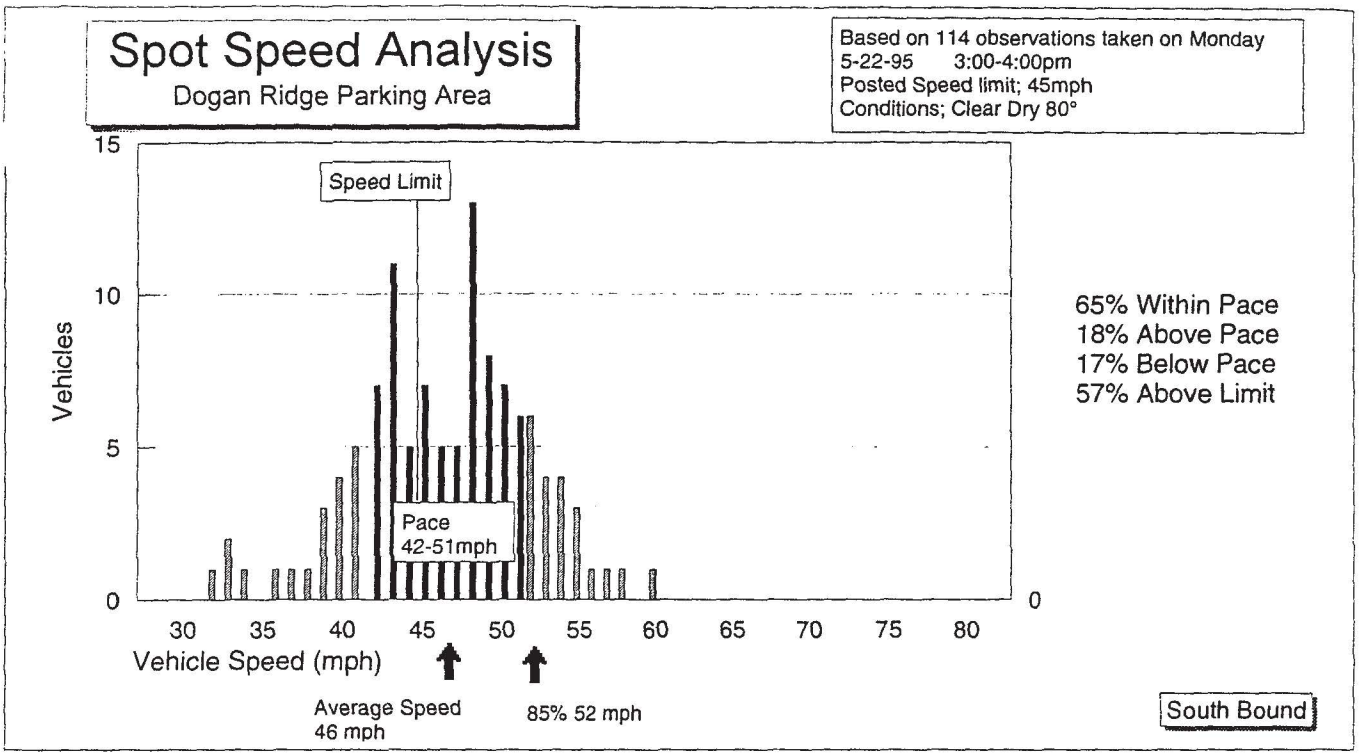
VA 234 in front of V.C.

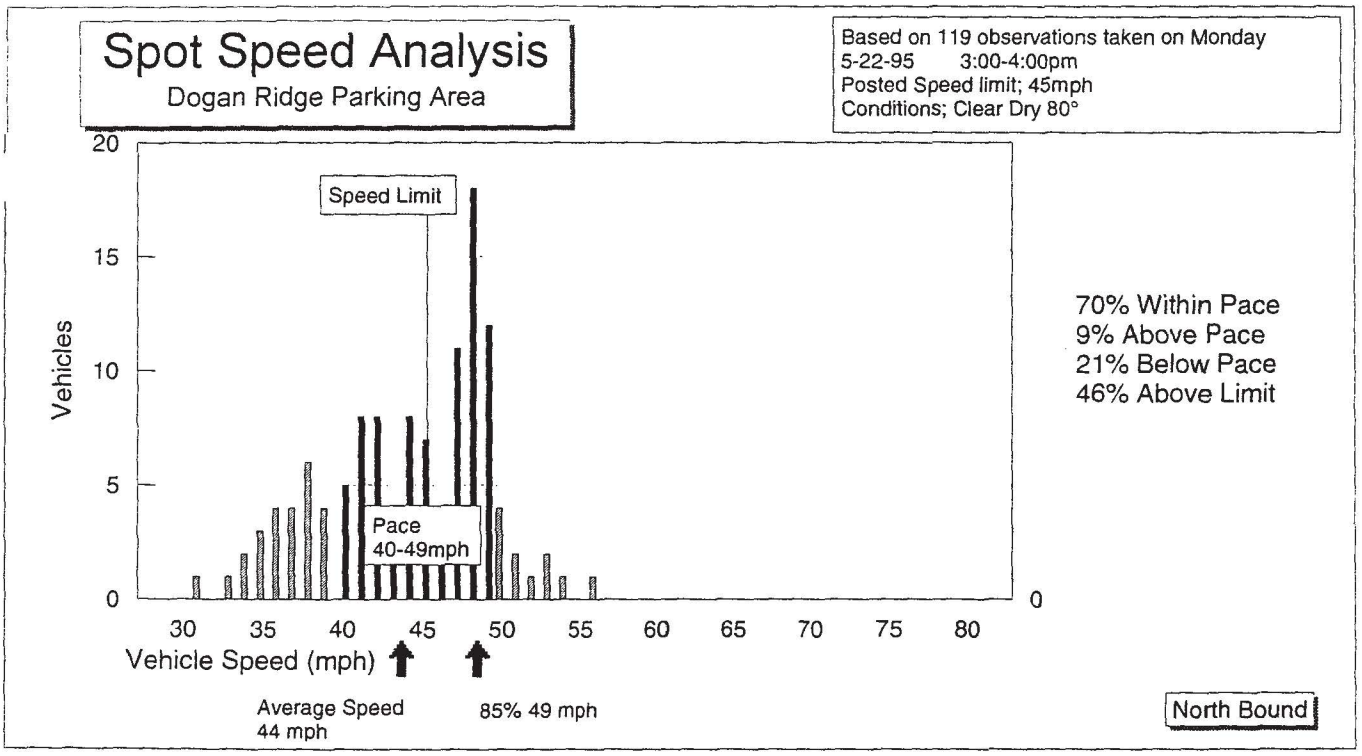
Based on 113 observations taken on Tuesday
5-23-95 12:15-1:15pm
Posted Speed limit; 45 mph
Conditions; Clear Dry 78°



58% Within Pace
15% Above Pace
26% Below Pace
69% Above Limit

North Bound

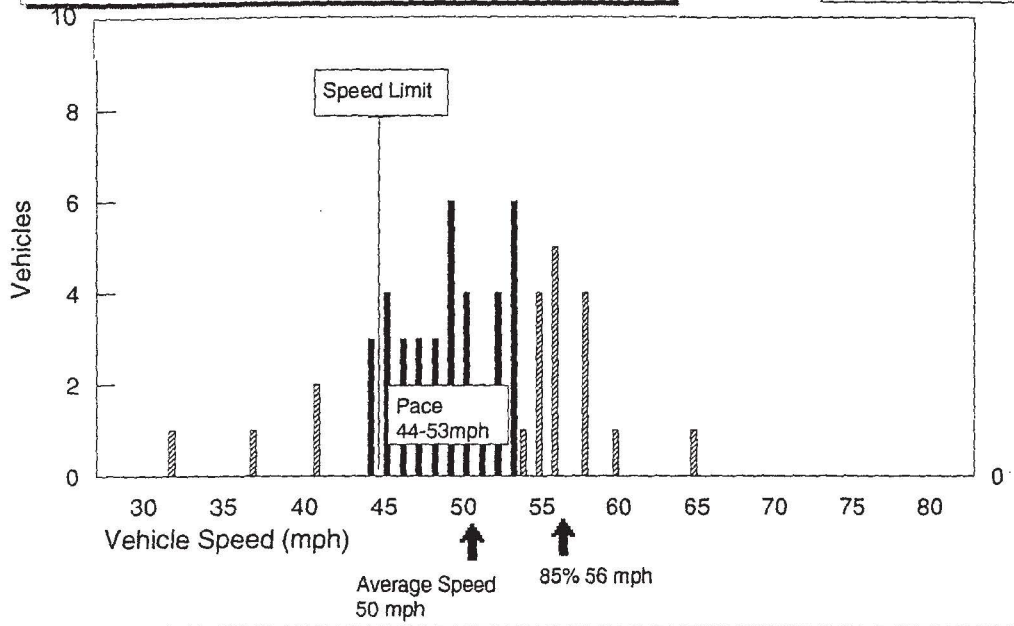

Spot Speed Analysis
Dogan Ridge Parking Area
Based on 114 observations taken on Monday
5-22-95 3:00-4:00pm
Posted Speed limit; 45mph
Conditions; Clear Dry 80°
Speed Limit
Pace
42-51mph
Vehicles
Vehicle Speed (mph)
65% Within Pace
18% Above Pace
17% Below Pace
57% Above Limit
Average Speed
46 mph
85% 52 mph
South Bound


Spot Speed Analysis
Dogan Ridge Parking Area
Based on 119 observations taken on Monday
5-22-95 3:00-4:00pm
Posted Speed limit; 45mph
Conditions; Clear Dry 80°
Speed Limit
Pace
40-49mph
Vehicles
Vehicle Speed (mph)
70% Within Pace
9% Above Pace
21% Below Pace
46% Above Limit
Average Speed
44 mph
85% 49 mph
North Bound

Spot Speed Analysis

Straight-away Just N. of Dogan Ridge Picnic Area

Based on 58 observations taken on Saturday
5-21-95 1:30-2:00pm
Posted Speed limit; 45 mph
Conditions; Clear Dry



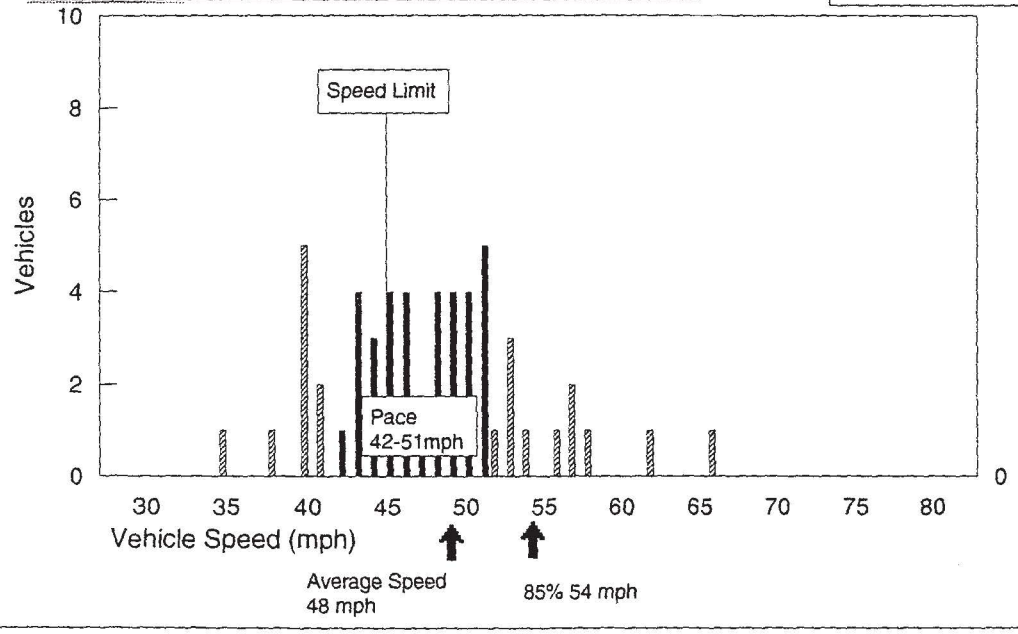
65% Within Pace
28% Above Pace
7% Below Pace
81% Above Limit

South Bound

Spot Speed Analysis

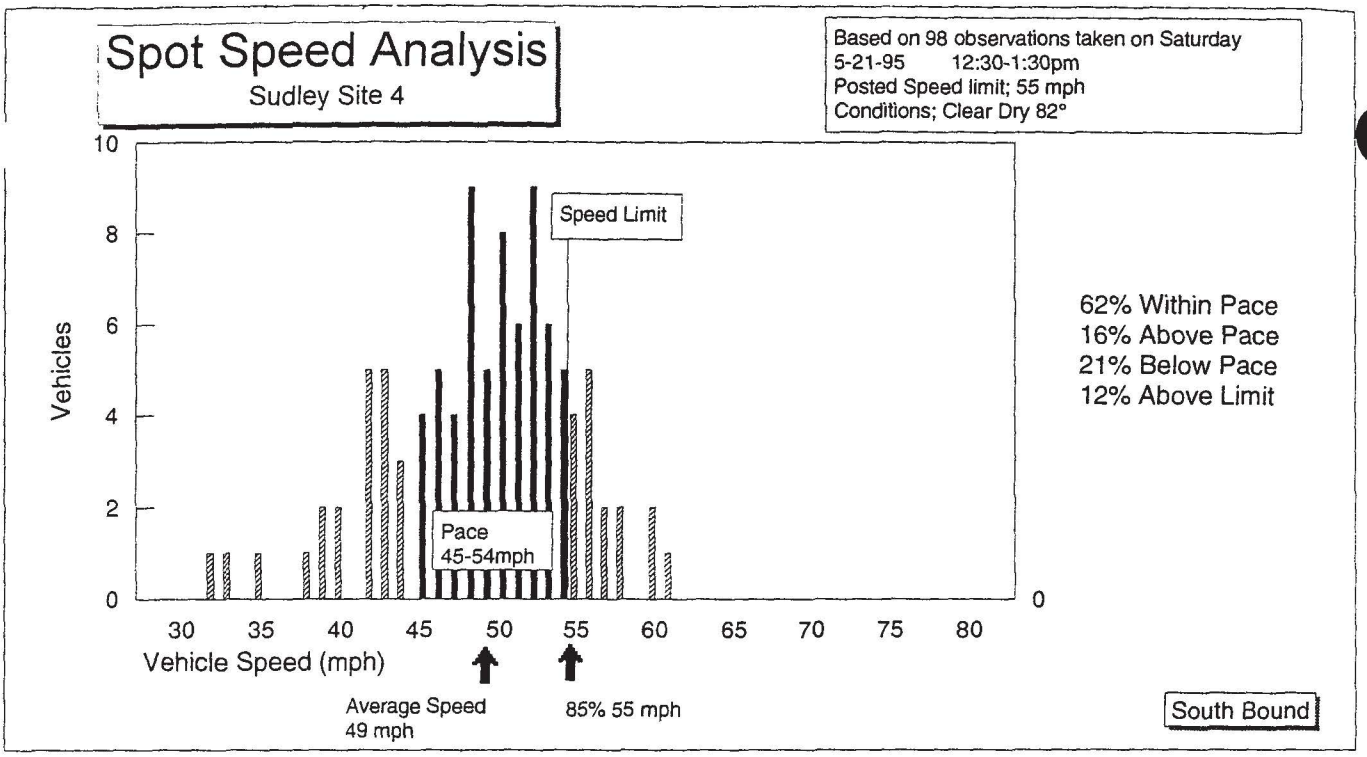
Straight-away Just N. of Dogan Ridge Picnic Area

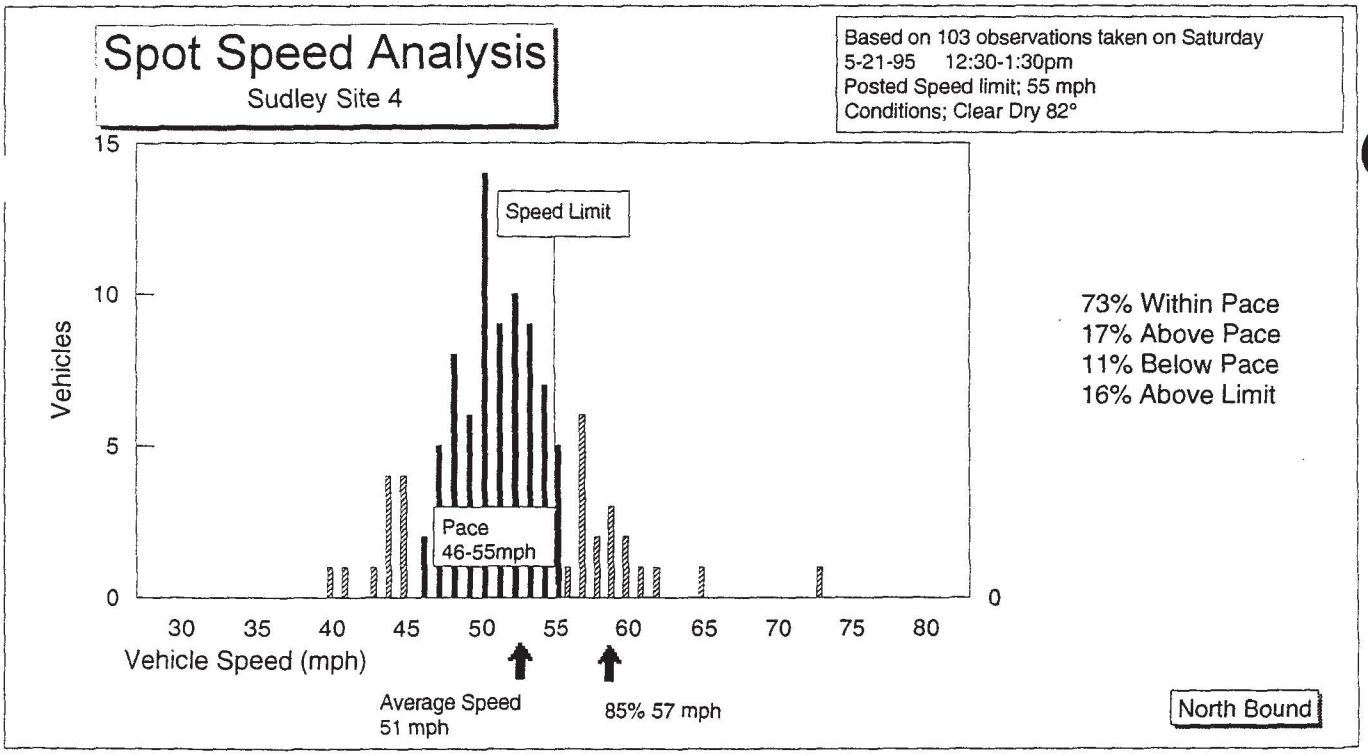
Based on 54 observations taken on Saturday
5-21-95 1:30-2:00pm
Posted Speed limit; 45 mph
Conditions; Clear Dry



63% Within Pace
20% Above Pace
17% Below Pace
54% Above Limit

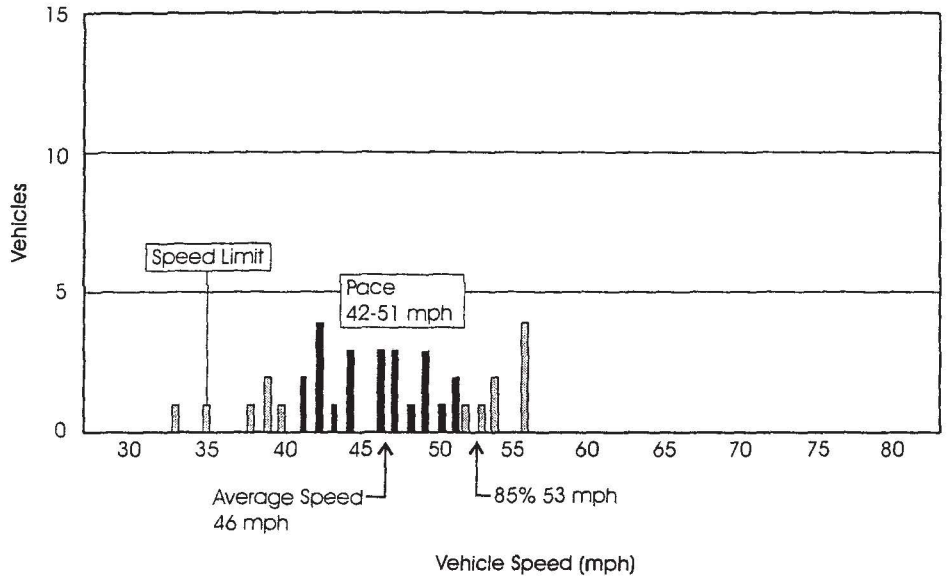
North Bound


Spot Speed Analysis
Sudley Site 4
Based on 98 observations taken on Saturday
5-21-95 12:30-1:30pm
Posted Speed limit; 55 mph
Conditions; Clear Dry 82°
Vehicles
Speed Limit
Pace
45-54mph
Vehicle Speed (mph)
Average Speed
49 mph
85% 55 mph
62% Within Pace
16% Above Pace
21% Below Pace
12% Above Limit
South Bound


Spot Speed Analysis
Sudley Site 4
Based on 103 observations taken on Saturday
5-21-95 12:30-1:30pm
Posted Speed limit; 55 mph
Conditions; Clear Dry 82°
Vehicles
Speed Limit
Pace
46-55mph
Vehicle Speed (mph)
Average Speed
51 mph
85% 57 mph
73% Within Pace
17% Above Pace
11% Below Pace
16% Above Limit
North Bound

Spot Speed Analysis
Groveton Rd. at Subdivision Entr.
(Northbound)

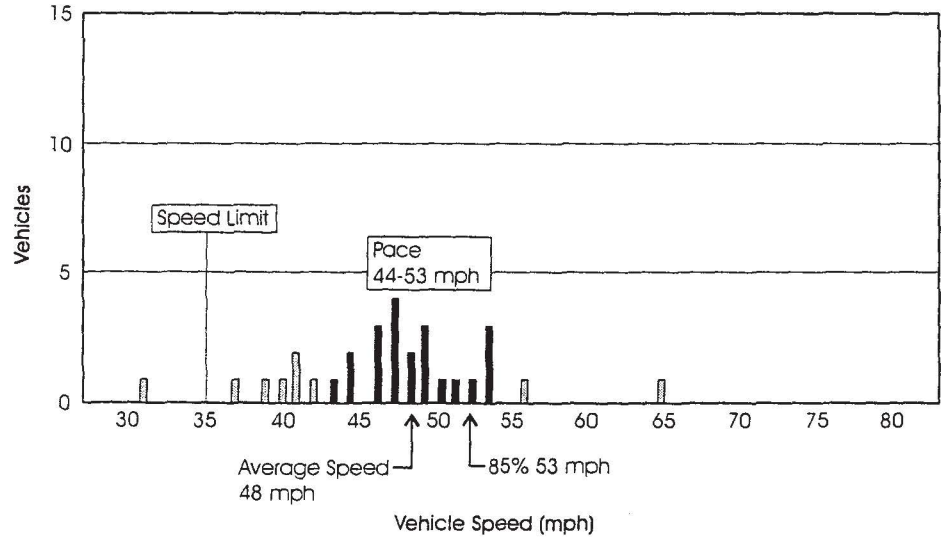
Based on 37 observations taken Thursday
7/13/95
Posted Speed Limit: 35 mph
Conditions: Sunny



62% Within Pace
22% Above Pace
16% Below Pace
95% Above Limit

Spot Speed Analysis
Groveton Rd. at Subdivision Entr.
(Southbound)

Based on 30 observations taken Thursday
7/13/95
Posted Speed Limit: 35 mph
Conditions: Sunny



70% Within Pace
7% Above Pace
23% Below Pace
97% Above Limit

Appendix D - Traffic Sign Inventory

Appendix D - Sign Inventory

Three separate signing inventories were conducted July 10 & 11, 1995. An inventory of signs located along roads within MNBP identified 470 existing signs. An inventory of signs at various visitor sites and parking areas within the Park identified 115 existing signs. Finally, an inventory of MNBP-related guidance signs outside Park boundaries identified an additional 16 existing signs. Inventoried signs are broken down by type and location in the following summary.

Internal Park Roads & Sites:

Type of Sign	# on Roads	# at Sites	Total
Regulatory (R)	83	19	102
Warning (W)	59	0	59
Guide:			
Route & Directional Markers (M)	103	0	103
Street Name & Destination (D)	60	0	60
Park-Related Destination & Info.	56	76	132
Object Markers (OM)	55	0	55
Park/Historical Interpretive & Info.	6	20	26
Other Misc. Informational	40	0	40
Private	8	0	8
Total	470	115	585

External Park-Related:

Guide	11
Park/Historical Interpretive	3
Total	14

This Appendix contains maps showing the locations of all existing on-road signs inventoried within MNBP, as well as all external guidance signs inventoried. In addition, this appendix contains a graphical representation of each sign identified within the Park (with the exception of the Park historical interpretive or informational signs, and the private signs). Finally, this appendix contains a complete database listing for each of the three sign inventories. The database includes a reference number so that individual signs can be located on the inventory maps; a sign identification number which correlates to the graphical sign inventory; information on the appearance, size and post type of each sign; and specific comments pertaining to each sign inventoried.

General Signing Comments:

- Signs in the Park are generally in good-fair condition
- Advance warning signs would be helpful for Park sites and parking areas. These could utilize the same style and color scheme as the existing Park site name signs.
- Blue and white "Tour" and site # markers are ineffective (too small and not very visible). These could be replaced with larger, brighter markers for increased driver recognition.
- Park rock-base entrance signs are not all located at Park boundaries, particularly the sign at

the west entrance to the Park. These entrance signs should be moved to the actual Park boundaries where practical.

- External Park guidance signing is not very consistent.
  - The Park is referred to on various signs as: Manassas National Battlefield Park, National Battlefield Park, Battlefield Park, and Manassas Battlefield.
  - External Park references appear on both white/green and white/brown guidance signs.
  - Park signs are competing with similar guidance signs for: Bull Run Park, Manassas Museum, Manassas, Ben Lomond Park, and Community College.
  - Both EB and WB approaches to VA 234 on I-66 have large white/brown signs directing a driver to the correct exit. The next sign for the Park is very small, white/green, and also contains reference to the community college. On EB I-66 exit 47, this follow-up sign is preceded by much larger white/brown signs with guidance to Manassas Museum and Ben Lomond Park.
- Signs along Park roadways are mainly using square wood posts for support. These posts should be replaced with breakaway supports, particularly wherever a sign is set within the clear zone.
- The Henry House historical marker on VA 234 just south of the Park stoplight is an "attractive nuisance" to drivers. There are no advanced warning signs for this marker, nor is a vehicle pullout provided (the area is posted "No Parking"); although the sign is adjacent to the highway. Either the marker should be moved further away from the roadway (presumably along the pedestrian path), or a pullout should be provided along with advance warning for motorists.
- The W1-2R (Right Curve Warning) sign on VA 234 just north of Featherbed Lane is modified with a side road stub to the right side. This additional stub is not evident at first glance. This sign should probably be replaced by a standard W1-2R sign, followed by a W2-2R sign for side road warning purposes.
- The R1-1 (Stop) sign at the intersection of Featherbed Lane and U.S. 29 is undersized, and obscured until the last minute by low-hanging tree branches. The sign should be replaced with a standard size (30"x30"), and the offending tree branches trimmed back.
- The R1-1 (Stop) sign at the intersection of Featherbed Lane and VA 234 is undersized. The sign should be replaced with a standard size (30"x30").
- The R1-1 (Stop) sign at the intersection of Pageland Lane and Groveton Road is undersized, and obscured until the last minute by overhanging tree branches and a shart right curve leading into the intersection. The sign should be replaced with a standard size (30"x30"), offending tree branches should be trimmed back, and a W3-1a (Stop Ahead Warning) sign should be considered for installation in advance of the intersection on Pageland Lane.

Manassas National Battlefield Park

Sign Inventory — Monday-Tuesday July 10-11, 1995

Internal Park Roads — T. Donaldson — revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height Offset	Condition	Comments
U.S. Highway 29 - Westbound								
A-1	3a	white	brown	30"x24"	sq. wood			Historical/Marker/500 Ft Right
A-2	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-3	N7-1	white	blue	30"x24"	sq. wood			Battlefield Equestrian Society
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
A-4	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-5	W11-3	black	yellow	30"x30"	sq. wood			
	W7-3a	black	yellow	24"x18"				Next/4 Miles
A-6	1	brown/white	blue/gray	72"x48"	stone	0'		Manassas/National Battlefield Park/U.S. Department of the Interior/National Park Service
A-7	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-8	5a	white	green	18"x18"	sq. wood			Bull/Run
	6a	white	green	48"x36"				Enter/Prince William Co/Leave/Fairfax Co
A-9	7	black	white	40"x40"	md metal	4'		VA historic marker: Prince William County
A-10	8a	white	brown	36"x8"	sq. wood (2)			Stone Bridge; double-sided
	9k	white	blue	8"x12"				tour #12; facing west
A-11	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-12	10	white/blue/black	white	18"x24"	sq. wood			Safety Belts/Hold Lives Together
A-13	OM-3R	black	yellow	12"x36"	adj. metal			(4) signs mounted behind guardrail
A-14	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-15	W11-7	black	yellow	30"x30"	sq. wood			
A-16	4	black	white	12"x8"	adj. metal			Gas Warning Line; facing west
A-17	11	black	white	12"x18"	sq. wood			Horseback/Riding/Prohibited; facing highway; obscured by small pine tree
A-18	12	white/black	red/white	18"x24"	adj. metal			Snow Emergency Route
A-19	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-20	R8-3	red	white	12"x18"	wood gate			facing highway @ farm field approach
	45b,d,e	white/red	brown	6"x18"				horses ok/hiking ok/no biking; facing highway @ farm field approach
A-21	13a	white	brown	10"x12"	sq. metal			Private/Residence/No/Trespassing; facing highway
A-22	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-23	5b	white	green	24"x18"	sq. wood			Youngs/Branch
A-24	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-25	4	black	white	12"x8"	adj. metal			Gas Warning Line
A-26	R8-3	red	white	12"x18"	wood gate			facing highway @ farm field approach
A-27	R2-5a	black	white	24"x30"	sq. wood			
A-28	R2-1	black	white	24"x30"	sq. wood			45 m.p.h.
A-29	M1-5	black/white	black	24"x24"	sq. wood			VA Highway 234
	14a	white	green	48"x24"				Sudley Rd/Next Signal
A-30	M3-3	black	white	24"x12"	6" sq. wood, branched			
	M1-5	black/white	black	24"x24"				VA Highway 234
	M5-1L	black	white	21"x15"				
	M3-3	black	white	24"x12"				
	M1-4	black/white	black	24"x24"				U.S. Highway 29
	M6-3	black	white	21"x15"				
	M3-1	black	white	24"x12"				
	M1-5	black/white	black	24"x24"				VA Highway 234
	M5-1R	black	white	21"x15"				
A-31	5b	white	green	24"x18"	sq. wood			Youngs/Branch
A-32	M4-5	white	blue	24"x12"	sq. wood			
	M1-1	white	red/blue	24"x24"				Interstate 66
	M5-1L	white	blue	21"x15"				
A-33	D1-3	white	green	96"x72"	sq. wood (2)			Warrenton/Manassas/Dumfries
	15a	white	green	84"x12"				Northern VA Comm Coll
	16a	white	brown	106"x12"				Manassas Nat Battlefield Park
A-34	D3	white	green	24"x8"	md. metal			Sudley Rd
	D3	white	green	24"x8"				Lee Hy; mounted @ 90degrees
A-35	17a	black	white	48"x30"	sq. wood			Advanced/Green Signal/Mon-Fri/3:30 pm-6:30 pm
Stoplight Intersection								
A-36	M4-5	white	blue	24"x12"	sq. wood			
	M1-1	white	red/blue	24"x24"				Interstate 66
	M6-3	white	blue	21"x15"				
	M3-3	black	white	24"x12"	6" sq. wood, branched			
	M1-5	black/white	black	24"x24"				VA Highway 234
	M6-1L	black	white	21"x15"				
	M3-3	black	white	24"x12"				
	M1-4	black/white	black	24"x24"				U.S. Highway 29
	M6-3	black	white	21"x15"				
	M3-1	black	white	24"x12"				
	M1-5	black/white	black	24"x24"				VA Highway 234
	M6-1R	black	white	21"x15"				
A-37	3a	white	brown	30"x24"	sq. wood			Historical/Marker/500 Ft Right
A-38	N7-1	white	blue	30"x24"	sq. wood			Save The Battlefield/Coalition
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
A-39	12	white/black	red/white	18"x24"	adj. metal			Snow Emergency Route
A-40	7	black	white	40"x40"	md metal	4'		VA historic marker: C 48/Campaign Of Second Manassas
A-41	7	black	white	40"x40"	md metal	4'		VA historic marker: C 44/ First Battle Of Manassas
A-42	18	white	green	54"x12"	sq. wood			The 29th Infantry Division/Memorial Highway
A-43	M3-1	black	white	24"x12"	sq. wood			
	M1-4	white/black	white	24"x24"				
	D2-3	white	green					Gainesville-5/Warrenton-17
A-44	OM-3R	black	yellow	12"x36"	adj. metal			marks culvert end
A-45	19	white	green	12"x10"	sq. wood			Lee Highway
A-46	13b	white	brown	18"x12"	sq. wood			Private Residence
A-47	5b	white	green	24"x18"				Youngs/Branch
A-48	45f,e	white/red	brown	6"x12"	sq. wood			ped ok/no bikes; facing highway @ side of grass trail
A-49	20	white	brown	54"x18"	sq. wood (2)			Groveton Cemetery/Dogan House Parking
A-50	W21	black	yellow	36"x36"	sq. wood			Watch/For Turning/Vehicles
A-51	20	white	brown	54"x18"	sq. wood (2)			Groveton Cemetery/Dogan House Parking

Manassas National Battlefield Park

Sign Inventory — Monday-Tuesday July 10-11, 1995

Internal Park Roads — T. Donaldson — revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height	Offset	Condition	Comments
A-52	W11-7	black	yellow	30"x30"	sq. wood				
A-53	9l	white	blue	8"x16"	sq. wood				Tour
A-54	W6-1	black	yellow	36"x36"	sq. wood				
A-55	R4-7c	black	white	36"x36"	sq. wood				
A-56	OM-3R	black	yellow	12"x36"					(9) signs
A-57	R4-7d	black	white	60"x36"	sq. wood				double-sided; set in median
A-58	OM-3R	black	yellow	12"x36"					(2) signs; set in median
A-59	22	black	white	40"x40"	sq. wood				Stop For/School Bus/Loading Or Unloading/Children/State Law
A-60	12	white/black	red/white	18"x24"	adj. metal				Snow Emergency Route
A-61	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-62	45e	white/red	brown	8"x8"	rnd. wood				no bikes; mounted @ side of farm field approach (Warrenton Turnpike parking area)
A-63	OM-3R	black	yellow	12"x36"	adj. metal				marking culvert ends; (2) signs-one each side of highway
A-64	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-65	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-66	OM-3R	black	yellow	12"x36"	adj. metal				marking culvert ends; (2) signs-one each side of highway
A-67	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-68	OM-3R	black	yellow	12"x36"	adj. metal				marking bridge abutment; (2) signs-one each side of highway
A-69	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-70	OM-3R	black	yellow	12"x36"	adj. metal				marking RCP culvert ends; (2) signs-one each side of highway
A-71	W2-1	black	yellow	30"x30"	sq. wood				(2) signs-one each side of highway
A-72	private		brown		(2)				Rainbow Village ... (private sign up on hill)
A-73	D3	white	green	24"x8"	rnd. metal				Pageland La
	D3	white	green	24"x8"					Lee Hwy; mounted @ 90degrees
A-74	R6-1L	black/white	black	36"x12"	sq. wood				
A-75	R6-1R	black/white	black	36"x12"	sq. wood				set in median
U.S. Highway 29 - Eastbound									
A-76	D3	white	green	24"x8"	rnd. metal				Pageland La
	D3	white	green	24"x8"					Lee Hwy; mounted @ 90degrees
A-77	R6-1R	black/white	black	36"x12"	sq. wood				
A-78	R6-1L	black/white	black	36"x12"	sq. wood				set in median
A-79	31b	white	brown	18"x8"	fence				12521; carved wood
A-80	N7-1	white	blue	30"x24"	sq. wood				Save The Battlefield/Coalition; (2) signs-one each side of highway
	W21-6a	black	orange	36"x36"					Cleanup/Crew/Working; hinged-down; (2) signs-one each side of highway
A-81	W11-3	black	yellow	30"x30"	sq. wood				
	W7-3a	black	yellow	24"x24"					Next/4 Miles
A-82	OM-3R	black	yellow	12"x36"					marks culvert end; set in median
A-83	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-84	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-85	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-86	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-87	W6-2	black	yellow	36"x36"	sq. wood				(2) signs-one each side of highway
A-88	W9-2R	black	yellow	36"x36"	sq. wood				(2) signs-one each side of highway
A-89	R6-1L	black/white	black	36"x12"	sq. wood				facing median crossroad
A-90	W4-2L	black	yellow	36"x36"	sq. wood				(2) signs-one each side of highway
A-91	OM-3R	black	yellow	12"x36"					(3) signs; set in median
A-92	R5-9	white	red	36"x24"	sq. wood				(2) signs-one each side of highway
A-93	R5-1	white/red	white	36"x36"	sq. wood				(2) signe-one each side of highway
A-94	OM-3R	black	yellow	12"x36"					(9) signs
A-95	12	white/black	red/white	18"x24"	sq. wood				Snow Emergency Route
A-96	W11-7	black	yellow	30"x30"	sq. wood				
A-97	W21	black	yellow	36"x36"	sq. wood				Watch/For Turning/Vehicles
A-98	D3	white	green	24"x8"	rnd. metal				Groveton Rd
	D3	white	green	24"x8"					Lee Hwy; mounted @ 90degrees
	D3	white	green	24"x8"					Featherbed Ln
A-99	1	brown/white	blue/gray	72"x48"	stone		0'		Manassas/National Battlefield Park/U.S. Department of the Interior/National Park Service
A-100	5b	white	green	24"x18"	sq. wood				Youngs/Branch
A-101	R2-1	black	white	24"x30"	sq. wood				55 m.p.h.
A-102	R2-5a	black	white	24"x30"	sq. wood				
A-103	R2-1	black	white	24"x30"	sq. wood				45 m.p.h.
A-104	M1-5	black/white	black	24"x24"	sq. wood				VA Highway 234
	14a	white	green	48"x24"					Sudley Rd/Next Signal
A-105	3b	white	brown	30"x24"	sq. wood				Historical/Marker/500 Ft Left
A-106	M3-1	black	white	24"x12"	6" sq. wood, branched				
	M1-5	black/white	black	24"x24"					VA Highway 234
	M5-1L	black	white	21"x15"					
	M3-1	black	white	24"x12"					
	M1-4	black/white	black	24"x24"					U.S. Highway 29
	M6-3	black	white	21"x15"					
	M3-3	black	white	24"x12"					
	M1-5	black/white	black	24"x24"					VA Highway 234
	M5-1R	black	white	21"x15"					
A-107	D1-3	white	green	96"x72"	sq. wood (2)				Washington/Manassas/Dumfries
	15b	white	green	84"x12"					Northern VA Comm Coll
	16b	white	brown	106"x12"					Manassas Nat Battlefield Park
A-108	17b	black	white	48"x30"	sq. wood				Delayed/Green Signal/Mon-Fri/3:30 pm-6:30 pm
Stoplight Intersection									
A-109	M4-5	white	blue	24"x12"	sq. wood				
	M1-1	white	red/blue	24"x24"					Interstate 66
	M6-1R	white	blue	21"x15"					
	M3-1	black	white	24"x12"	6" sq. wood, branched				
	M1-5	black/white	black	24"x24"					VA Highway 234
	M6-1L	black	white	21"x15"					
	M3-1	black	white	24"x12"					
	M1-4	black/white	black	24"x24"					U.S. Highway 29
	M6-3	black	white	21"x15"					

Manassas National Battlefield Park

Sign Inventory — Monday-Tuesday July 10-11, 1995

Internal Park Roads — T. Donaldson — revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height Offset	Condition	Comments
	M3-3 black		white	24"x12"				
	M1-5 black/white		black	24"x24"				VA Highway 234
	M6-1R black		white	21"x15"				
A-110	R8-3a black/red		white	24"x24"	sq. wood			
A-111	M3-1 black		white	24"x12"	sq. wood (2)			
	M1-4 black/white		black	24"x24"				U.S. Highway 29
	D2-3 white		green					Fairfax-12/Arlington-25/Washington-26
A-112	R2-1 black		white	24"x30"	sq. wood			45 m.p.h.
	12 white/black		red/white	18"x24"	sq. wood			Snow Emergency Route
A-113	N7-1 white		blue	30"x24"	sq. wood			Battlefield Equestrian Society
	W21-6a black		orange	36"x36"				Cleanup/Crew/Working; hinged-down
A-114	5b white		green	24"x18"	adj. metal			Youngs/Branch
A-115	23 white		blue	80"x48"	sq. wood			Commuter Information/800-745-RIDE
A-116	W11-7 black		yellow	30"x30"	sq. wood			
A-117	7 black		white	40"x40"	md metal	4'		VA historic marker: G 16/James Robinson House
A-118	R2-1 black		white	24"x36"	sq. wood			55 m.p.h.
A-119	R8-3 red		white	12"x18"	wood gate			facing highway @ farm field approach
A-120	5b white		green	24"x18"	adj. metal			Youngs/Branch
A-121	R8-3 red		white	12"x18"	sq. metal			facing highway @ farm field approach
	45b,d,e white/red		brown	6"x18"				horseback riding ok/hiking ok/no bikes; stickers
A-122	45b white		brown	8"x8"	sq. metal			horseback riding ok; set on trail behind gate @ farm field approach
A-123	R8-3 red		white	12"x18"	sq. metal			(2) signs facing highway-one each side of farm field approach
A-124	45e white/red		brown	8"x8"	md. wood			no bikes; mounted on gate post @ farm field approach
A-125	OM-3R black		yellow	12"x36"	adj. metal			(2) signs set behind guardrail
A-126	3b white		brown	30"x24"	sq. wood			Historical/Marker/500 Ft Left
A-127	OM-3R black		yellow	12"x36"	adj. metal			(2) signs set behind guardrail
A-128	5a white		green	12"x12"	sq. wood			Bull/Run
	6b white		green	48"x36"				Enter/Fairfax Co/Leave/Prince William Co
A-129	18 white		green	54"x12"	sq. wood			The 29th Infantry Division/Memorial Highway
A-130	12 white/black		red/white	18"x24"	sq. wood			Snow Emergency Route
A-131	N7-1 white		blue	30"x24"	sq. wood			Centreville Foot Care/James M. Hurst D.P.M.
	W21-6a black		orange	36"x36"				Cleanup/Crew/Working; hinged-down
A-132	W24 black		yellow	48"x48"	sq. wood			Industrial/Area
	W7-3a black		yellow	24"x24"				Next/1/2/Mile
Virginia Highway 234 - Northbound								
B-1	W11-7 black		yellow	30"x30"	sq. wood			
B-2	R8-3a red/black		white	24"x24"	sq. wood			
B-3	R4-1 black		white	18"x24"	sq. wood			
B-4	W11-3 black		yellow	30"x30"	sq. wood			
	W7-3a black		yellow	24"x18"				
B-5	25 green/white		white/green	18"x24"	sq. wood			Keep/Virginia/Green/Prevent/Forest Fires; double-sided
B-6	R2-1 black		white	24"x36"	sq. wood			45 m.p.h.
B-7	26a white		brown	48"x24"	6" sq. wood			Visitor/Center
B-8	R8-3a red/black		white	24"x24"	sq. wood			
B-9	27a,b white		brown	36"x18"	sq. wood (3)	1.5'		Picnic/Area/1 Mile; two-faced/L-shaped; carved wood sign
B-10	W3-3 green/red/black		yellow	36"x36"	sq. wood			
B-11	R5-1 red/white		white	24"x24"	sq. wood			facing highway @ farm field approach
	R8-3 red		white	12"x18"	wood gate			facing highway @ farm field approach
B-12	M1-4 black/white		black	24"x24"	sq. wood			U.S. Highway 29
	14b white		green	48"x24"				Lee Hwy/Next Signal
B-13	M3-3 black		white	24"x12"	6" sq. wood, branched			
	M1-4 black/white		black	24"x24"				U.S. Highway 29
	M5-1L black		white	21"x15"				
	M3-1 black		white	24"x12"				
	M1-5 black/white		black	24"x24"				VA Highway 234
	M6-3 black		white	21"x15"				
	M3-1 black		white	24"x12"				
	M1-4 black/white		black	24"x24"				U.S. Highway 29
	M5-1R black		white	21"x15"				
B-14	R8-3a red/black		white	24"x24"	sq. wood			
B-15	D1-3 white		green	54"x30"	6" sq. wood			Rt 15 North/Warrenton/Washington
	D1-1a white		blue	48"x12"				Camping-9
B-16	7 black		white	40"x40"	md metal	4'		VA historic marker: G 15/Henry House; no advanced warning signs or pullout area
B-17	OM-3R black		yellow	12"x36"	sq. wood	2'		marks concrete curb for creek crossing
B-18	M3-3 black		white	24"x12"	6" sq. wood, branched			
	M1-4 black/white		black	24"x24"				U.S. Highway 29
	M6-1L black		white	21"x15"				
	M3-1 black		white	24"x12"				
	M1-5 black/white		black	24"x24"				VA Highway 234
	M6-3 black		white	21"x15"				
	M3-1 black		white	24"x12"				
	M1-4 black/white		black	24"x24"				U.S. Highway 29
	M6-1R black		white	21"x15"				
	R8-3a red/black		white	24"x24"	sq. wood			
B-19	? black		orange	18"x12"	md. metal			?; facing north
B-20	R10-6 black		white	24"x36"	sq. wood			
Stoplight Intersection								
B-21	4 black		white	12"x8"	adj. metal			Gas Warning Line
B-22	12 white/black		red/white	18"x24"	adj. metal			Snow Emergency Route
B-23	M3-1 black		white	24"x12"	sq. wood			
	M1-5 black/white		black	24"x24"				VA Highway 234
	D2-1 white		green	48"x12"				Route 15-8
B-24	R2-1 black		white	24"x30"	sq. wood			45 m.p.h.
B-25	N7-1 white		blue	30"x24"	sq. wood			PWC Litter/Control Council
	W21-6a black		orange	36"x36"				Cleanup/Crew/Working; hinged-down

Manassas National Battlefield Park

Sign Inventory — Monday-Tuesday July 10-11, 1995

Internal Park Roads — T. Donaldson — revised 11/01/95

Map No.	Sign Type	Color: Legend	Color: Background	Size	Post	Height Offset	Condition	Comments
B-26	W1-2L	black	yellow	30"x30"	sq. wood			
	W13-1	black	yellow	24"x24"				35 m.p.h.
B-27	W1-6L	black	yellow	48"x24"	sq. wood			
	W1-6R	black	yellow	48"x24"				mounted @ 90degrees - facing SB traffic
B-28	W1-6L	black	yellow	48"x24"	sq. wood			
	W1-6R	black	yellow	48"x24"				mounted @ 90degrees - facing SB traffic
B-29	W1-2R	black	yellow	30"x30"	sq. wood			
B-30	W11-2	black	yellow	30"x30"	sq. wood			
B-31	28	white	brown	36"x8"	sq. wood (2)			Picnic/Area
	9m	white	blue	8"x16"				Tour
B-32	W11-7	black	yellow	30"x30"	sq. wood			
B-33	12	white/black	red/white	18"x24"	sq. wood			Snow Emergency Route
B-34	R2-1	black	white	24"x30"	sq. wood			55 m.p.h.
B-35	D3	white	green	24"x8"	rnd. metal			Sudley Rd/SR 234
	D3	white	green	24"x8"				Poplar Ford Tl; mounted @ 90degrees
B-36	9m	white	blue	8"x16"	sq. wood	low		Tour
B-37	W1-2L	black	yellow	30"x30"	sq. wood			
	W13-1	black	yellow	18"x18"				40 m.p.h.
B-38	N7-1	white	blue	30"x24"	sq. wood			42nd Virginia/Infantry C.S.A.
B-39	9m	white	blue	8"x16"	sq. wood			Tour
B-40	R8-3	red	white	12"x18"	wood gate			facing highway @ farm field approach
B-41	D3	white	green	24"x8"	rnd. metal			Sudley Rd
	D3	white	green	24"x8"				Featherbed Ln; mounted @ 90degrees
B-42	5c	white	green	24"x18"	sq. wood			Catharpin/Run
Virginia Highway 234 - Southbound								
B-43	+ W1-2R	black	yellow	30"x30"	sq. wood			with side road stub to right; stub is not evident at first glance
	W13-1	black	yellow	24"x24"				40 m.p.h.
B-44	5c	white	green	24"x18"	sq. wood			Catharpin/Run
B-45	12	white/black	red/white	18"x24"	adj. metal			Snow Emergency Route
B-46	private	red/black	white	42"x48"	sq. wood (2)			church sign
B-47	private				stone			Sudley Methodist Church; facing highway
B-48	private					0.5'		5308 Sudley Road; facing highway
B-49	7	black	white	40"x40"	rnd metal	4'		VA historic marker: Sudley Methodist Church
B-50	N7-1	white	blue	30"x24"	sq. wood			PWC Litter/Control Council
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
B-51	1	brown/white	blue/gray	72"x48"	stone	0'		Manassas/National Battlefield Park/U.S. Department of the Interior National Park Servi
B-52	R2-5a	black	white	24"x30"	sq. wood			
B-53	R2-1	black	white	24"x30"	sq. wood			45 m.p.h.
B-54	W1-2L	black	yellow	30"x30"	sq. wood			
B-55	W11-7	black	yellow	30"x30"	sq. wood			
B-56	R2-1	black	white	24"x30"	sq. wood			45 m.p.h.
B-57	W1-2L	black	yellow	30"x30"	sq. wood			
B-58	W11-2	black	yellow	30"x30"	sq. wood			
	W13-1	black	yellow	24"x24"				Next/2.5 miles
B-59	12	white/black	red/white	18"x24"	sq. wood			Snow Emergency Route
B-60	W1-2R	black	yellow	30"x30"	sq. wood			
	W13-1	black	yellow	24"x24"				35 m.p.h.
B-61	W3-3	green/red/black	yellow	36"x36"	sq. wood			with (2) amber flashers mounted above
B-62	M1-4	black/white	black	24"x24"	sq. wood			U.S. Highway 29
	14b	white	green	48"x24"				Lee Hwy/Next Signal
B-63	M3-1	black	white	24"x12"	6" sq. wood, branched			
	M1-4	black/white	black	24"x24"				U.S. Highway 29
	M5-1L	black	white	21"x15"				
	M3-3	black	white	24"x12"				
	M1-5	black/white	black	24"x24"				VA Highway 234
	M6-3	black	white	21"x15"				
	M3-3	black	white	24"x12"				
	M1-4	black/white	black	24"x24"				U.S. Highway 29
	M5-1R	black	white	21"x15"				
B-64	D1-3	white	green		sq. wood			Manassas/Washington/Warrenton
B-65	29	black	yellow/whit	48"x36"	sq. wood			Notice/Opposing/Right Turn Traffic/Does Not Yield
B-66	R10-10a	black	white	24"x30"	overhead			hanging between two signal heads
Stoplight Intersection								
B-67	D3	white	green	24"x8"	rnd. metal			Lee Hy
	D3	white	green	24"x8"				Sudley Rd; mounted @ 90degrees
B-68	M3-1	black	white	24"x12"	6" sq. wood, branched			
	M1-4	black/white	black	24"x24"				U.S. Highway 29
	M6-1L	black	white	21"x15"				
	M3-3	black	white	24"x12"				
	M1-5	black/white	black	24"x24"				VA Highway 234
	M6-3	black	white	21"x15"				
	M3-3	black	white	24"x12"				
	M1-4	black/white	black	24"x24"				U.S. Highway 29
	M6-1R	black	white	21"x15"				
B-69	R8-3a	red/black	white	24"x24"	sq. wood			
B-70	OM-3R	black	yellow	12"x36"				marks bridge abutment
B-71	M3-3	black	white	24"x12"	sq. wood (2)			
	M1-5	black/white	black	24"x24"				VA Highway 234
	D2-3	white	green	104"x42"				Manassas-6/Independent Hill-15/Dumfries-24
B-72	R8-3a	red/black	white	24"x24"	sq. wood			
B-73	N7-1	white	blue	30"x24"	sq. wood			PWC Litter/Control Council
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
B-74	R8-3a	red/black	white	24"x24"	sq. wood			
B-75	R2-1	black	white	24"x30"	sq. wood			45 m.p.h.
	R4-1	black	white	24"x30"				

Manassas National Battlefield Park

Sign Inventory
Internal Park Roads

Monday-Tuesday July 10-11, 1995
T. Donaldson revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height Offset	Condition	Comments
B-76	12	white/black	red/white	18"x24"	adj. metal			Snow Emergency Route
B-77	26b	white	brown	48"x24"	sq. wood			Visitor/Center
B-78	W8-5	black	yellow	30"x30"	sq. wood			
B-79	30	black	white	18"x24"	2" sq. metal	0.5'		Authorized/Vehicles/Only; (2) signs, one each side of approach
B-80	31a	white	brown	18"x8"	md. wood			6750; wood sign w/ carved numbers
B-81	W2-2	black	yellow	30"x30"	sq. wood			
B-82	32	white	green	54"x8"	sq. wood (2)			Community College
B-83	R8-3a	red/black	white	24"x24"	sq. wood			
B-84	33a	black	white	18"x6"	sq. wood			393; double-sided; set across from comm. coll. approach
	R8-3a	red/black	white	24"x24"				
B-85	R8-3a	red/black	white	24"x24"	sq. wood			
B-86	W6-1	black	yellow	36"x36"	sq. wood			
B-87	14c	white	green	54"x24"	sq. wood			Manassas Pkwy/Next Signal
B-88	34	white	blue	48"x30"	sq. wood			Free Bus/Vienna/Metro
	D4-2L	white	green	30"x36"				
B-89	R3-4	black/red	white	24"x24"	sq. wood			facing NB; set in median
B-90	R3-8a	black	white	30"x30"	sq. wood			
B-91	R4-7	black	white	24"x30"	sq. wood			set in median
B-92	1	brown/white	blue/gray	72"x48"	stone	0'		Manassas/National Battlefield Park/U.S. Department of the Interior/National Park Service
Featherbed Lane - Southbound								
C-1	R5-5a	black	white	24"x24"	sq. wood			
C-2	N7-1	white	blue	30"x24"	sq. wood			The Harts
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
C-3	W35	black	yellow	30"x30"	sq. wood			Road/Closed/High Water; hinged-down
C-4	OM-3R	black	yellow	12"x36"	adj. metal			marking culvert abutment; (2) signs-one each side of road
C-5	D3	white	green	18"x6"	md. metal			610-6148
	private	white	green	12"x18"				Private/Road/Not/Public/Maintained
C-6	private	black	white	18"x18"	sq. metal			Private/Road No/Trespassing
C-7	8b	white	brown	36"x12"	sq. wood (2)	3'		Unfinished/Railroad; set on LT side of road
	9e	white	blue	8"x12"		2'		tour #5
C-8	46	white	brown	30"x8"	sq. wood (2)	3'		Groveton Monument-.04 Mi/Deep Cut Loop Trail-1.1 Mi; carved wood sign
C-9	45c	white/red	brown	8"x8"	sq. metal			no horseback riding; set off to side of trail
C-10	8c	white	brown	36"x8"	sq. wood (2)	3'		Deep Cut
	9f	white	blue	8"x12"		2'		tour #6
C-11	OM-3R	black	yellow	12"x36"				marking culvert abutment; (2) signs-one each end of abutment
C-12	9m	white	blue	8"x16"	sq. wood	3'		Tour
C-13	33b	black	white	24"x6"	sq. wood			29
	33c	black	white	24"x6"				622; mounted @ 90degrees
	R1-1	white	red	24"x24"				undersized; obscured by tree branches
Featherbed Lane - Northbound								
C-14	47	white	brown	30"x10"	sq. wood (2)			5th & 10th N.Y. Monuments-0.7 Mi/Chinn House-1.1 Mi; carved wood sign
C-15	45b	white	brown	12"x12"	sq. metal			horseback riding ok
C-16	R5-5a	black	white	24"x24"	sq. wood			
C-17	N7-1	white	blue	30"x24"	sq. wood			The Harts
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
C-18	R8-3	red	white	12"x18"	metal gate			mounted @ farm field approach
C-19	45c	white/red	brown	8"x8"	sq. metal			no horseback riding; low mount
C-20	W35	black	yellow	30"x30"	sq. wood			Road/Closed/High/Water; hinged-down
C-21	OM-3R	black	yellow	12"x36"	adj. metal			marking culvert abutment; double-sided; (4) signs-two each side of road
C-22	33d	black	white	24"x6"	sq. wood			234
	33e	black	white	18"x6"				622; mounted @ 90degrees
	R1-1	white	red	24"x24"				undersized
Groveton Rd./Pageland Ln. Loop - Clockwise from Int. 622/29								
D-1	N7-1	white	blue	30"x24"	sq. wood			Bull Run Civil War/Round Table
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
D-2	R2-1	black	white	24"x30"	sq. wood			35 m.p.h.
D-3	W1-2R	black	yellow	30"x30"	sq. wood			
	W13-1	black	yellow	24"x24"				25 m.p.h.
D-4	OM-3R	black	yellow	12"x36"	adj. metal			marking culvert ends; double-sided; (4) signs-two each side of road
D-5	R1-1	white	red	24"x24"	sq. wood			undersized sign
D-6	33b	black	white	24"x6"	sq. wood			29
	33f	black	white	24"x6"				705; mounted @ 90degrees
	R1-1	white	red	24"x24"				set in median; undersized sign
Pageland Ln./Groveton Rd. Loop - Counter-clockwise from Int. 705/29								
D-7	R4-7	black	white	24"x30"	sq. wood			mounted on back of R1-1 in median
D-8	N7-1	white	blue	30"x24"	sq. wood			Bull Run Civil War/Round Table
	W21-6a	black	orange	36"x36"				Cleanup/Crew/Working; hinged-down
D-9	W1-3L	black	yellow	30"x30"	sq. wood			
	W13-1	black	yellow	24"x24"				25 m.p.h.
D-10	R1-1	white	red	24"x24"	sq. wood			undersized; not visible from distance due to sharp curve, hill and trees
D-11	D3	white	green	24"x6"	md. metal			Pageland Ln
	D3	white	green	24"x6"				Groveton Rd; mounted @ 90degrees
D-12	D3	white	green	24"x6"	md. metal			Groveton Rd
	D3	white	green	24"x6"				Gen Longstreets Line; mounted @ 90degrees
	private	white	green	12"x18"				Private/Road/Not/Public/Maintained
D-13	D3	white	green	24"x6"	sq. wood			Groveton Rd
	D3	white	green	24"x6"				Gen Warren Ave; mounted @ 90degrees
D-14	D3	white	green	24"x6"	md. metal			Groveton Rd 6700
	D3	white	green	24"x6"				Gen Longstreets Line 6800; mounted @ 90degrees
D-15	D3	white	green	24"x6"	md. metal			Groveton Rd 6700
	D3	white	green	24"x6"				Compton's La 6800 Pvt; mounted @ 90degrees
	private	white	red	12"x18"				Dead/End

Manassas National Battlefield Park

Sign Inventory — Monday-Tuesday July 10-11, 1995

Internal Park Roads — T. Donaldson — revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height Offset	Condition	Comments
D-16	45b	white	brown	12"x12"	sq. wood			horseback riding ok; off on horse trail, facing north
D-17	33b	black	white	24"x6"	sq. wood			29
	33c	black	white	24"x6"				622; mounted @ 90degrees
	R1-1	white	red	30"x30"				
Henry Hill/Chinn Ridge Loop - Counter-clockwise from entrance across from Visitor Center								
E-1	36	white	brown	24"x24"	sq. metal			Park/Grounds/Open/Daylight/Hours Only
E-2	38a	white/red	brown	36"x16"	sq. wood (2)	low		Chinn Ridge/no picnicking, dogs on leash ok; mounted low
E-3	37	white/gold	brown	24"x24"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center
E-4	39	white	brown	24"x12"	sq. wood	low		No/Alcoholic/Beverages; carved wood sign; mounted low
E-5	R2-1	black	white	12"x18"	sq. metal			25 m.p.h.; undersized
	40	black	white	18"x24"				Speed/Checked/By/Radar
E-6	41	black	white	12"x18"	sq. metal			Park/In/Designated/Areas/Only
	R7-5a	green	white	12"x18"				
E-7	R1-1	white	red	30"x30"	sq. metal			
E-8	W1-1R	black	yellow	24"x24"	sq. metal			undersized
E-9	9j	white	blue	8"x12"				tour #10
E-10	R4-7a	black	white	12"x18"	sq. metal			set in median @ Henry Hill circle; undersized
E-11	R8-3	red	white	12"x18"	gate			mounted on gate @ pullout
	45e	white/red	brown	8"x8"	rnd. wood			no bikes; mounted on fence post next to gate
E-12	8d	white	brown	36"x8"	sq. wood (2)			Hazel Plain; carved wood sign
	9i	white	blue	8"x12"				tour #9
E-13	R1-1	white	red	30"x30"	sq. metal			
E-14	36	white	brown	18"x24"	sq. metal			Park/Grounds/Open/Daylight/Hours Only
E-15	38a	white/red	brown	36"x12"	sq. wood (2)	low		Chinn Ridge/no picnicking, dogs on leash ok; mounted low
E-16	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center
E-17	R2-1	black	white	12"x18"	sq. metal			25 m.p.h.; undersized
	40	black	white	18"x30"				Speed/Checked/By/Radar
E-18	41	black	white	10"x18"	sq. metal			Park/In/Designated/Areas/Only
	R7-5a	green	white	12"x18"				
E-19	R1-1	white	red	30"x30"	sq. metal			
Park Visitor Center entrance road - inbound								
F-1	2	brown/white	blue/gray	72"x48"	stone	0'		Manassas/National Battlefield Park/Visitor Center/U.S. Department of the Interior/National
F-2	42	white	brown	30"x8"	sq. wood (2)	low		Henry Hill; mounted low
F-3	43	white	brown	24"x24"	sq. wood			Entrance/Fee/Adults $2.00/Under 17 Free
F-4	36	white	brown	18"x18"	sq. wood			Park/Grounds/Open/Daylight/Hours Only
	45a	white/red	brown	12"x12"				no picnicking
Park Visitor Center entrance road - outbound								
F-5	44	white	brown	36"x12"	sq. wood (2)	low		Battlefield Tour/Old Town Manassas-5.4 Miles; carved wood sign; mounted low
F-6	9l	white	blue	8"x16"	sq. wood			Tour
F-7	R1-1	white	red	30"x30"	sq. metal			
Vandor Lane								
G-1	13a	white	brown	18"x18"				Private/Residence/No/Trespassing; facing road @ driveway
G-2	45e	white/red	brown	12"x12"	rnd. wood			no bikes; mounted on gate post
Battery Heights entrance road								
H-1	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center; mounted a bit low
H-2	45a	white/red	brown	12"x12"	sq. metal	low		no picnicking; mounted low
	36	white	brown	18"x18"		low		Park/Grounds/Open/Daylight/Hours Only
New York Monuments entrance road								
I-1	38c	white/red	brown	36"x12"	sq. wood (2)	low		New York Ave./no picnicking, dogs on leash ok; mounted low
I-2	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center; mounted a bit low
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only
I-3	R1-1	white	red	30"x30"	sq. wood			

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Manassas National Battlefield Park

Sign Inventory
Internal Park Sites

Monday July 10, 1995
T. Donaldson

revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height Offset	Condition	Comments
Tour Site #1 - Battery Heights Parking Area								
	8e	white	brown	24"x12"	wood gate			Battery/Heights
	9a	white	blue	8"x12"	wood gate			tour #1; mounted below
	45e	white/red	brown	8"x8"	wood gate			no bikes
					sq. wood (2)			brochure, information board; set in grass
								interpretive plaque; set in grass
Tour Site #2 - Stone House Parking Area								
	8f	white	brown	36"x8"	sq. wood (2)			Stone House; set on grass behind fence
	9b	white	blue	8"x12"				tour #2; mounted on one post below
	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center; set on grass
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only
	R7-5b	green	white	12"x16"	sq. metal			set on grass
								(2) interpretive plaques; set on grass
		white	brown		sq. wood			trailhead sign; carved wood
Tour Site #3a - Dogan Ridge Picnic Area Pullout								
	8g	white	brown	36"x8"	sq. wood (2)			Dogan Ridge; carved wood
	9c	white	blue	8"x12"				tour #3; mounted on one post below
	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only
	38b	white	brown	36"x16"	sq. wood (2)			Picnic Area/restrooms, dogs on leash ok
								interpretive plaque
	45d,c,e	white/red	brown	6"x18"	rnd. wood			hiking ok, no horseback riding, no bikes; mounted on wood post near gate across road @
		white	brown		rnd. wood (2)			trailhead sign; carved wood; set behind gate across road @ trailhead
Tour Site #3b - Dogan Ridge Picnic Area Parking Lot								
	38b	white	brown	36"x16"	sq. wood (2)			Picnic Area/restrooms, dogs on leash ok; set on LT side of entrance to approach
	39	white	brown	30"x12"				No Alcoholic Beverages; mounted below
	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center; set on RT side of entrance to approach
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only; mounted below
Tour Site #4 - Sudley Parking Area								
	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only; mounted below
	9d	white	blue	8"x12"				tour #4
								(2) interpretive plaques
	48	white	brown	30"x8"	sq. wood	low		Sudley Trail; carved wood; set across highway @ trailhead
	45c	white/red	brown	8"x8"	sq. metal			no horseback riding; set across highway @ trailhead
Tour Site #5 - Unfinished Railroad Parking Area								
	37	white/gold	brown	18"x18"	sq. metal	low		Pay Park/Entrance Fee/At/Visitor Center
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only; mounted below
								trail guide sign
	45b,e	white/red	brown	6"x18"	sq. wood			horseback riding ok, blank, no bikes; set across road @ trailhead
				large				Unfinished Railroad ...; informational sign; set across road on trail
Tour Site #6 - Deep Cut Pullout								
	37	white/gold	brown	18"x18"	sq. metal	low		Pay Park/Entrance Fee/At/Visitor Center
								interpretive plaque
	45d,c,e	white/red	brown	6"x18"	sq. wood	low		hiking ok, no horseback riding, no bikes; set @ trailhead
	49	white	brown	30"x8"	sq. wood (2)	low		Dogan House-0.4 Mi/N.Y. Monuments-1.1 Mi; carved wood; set across road @ trailhead
	45b,d,e	white/red	brown	6"x18"	sq. wood	low		horseback riding ok, hiking ok, no bikes; set across road @ trailhead
Tour Site #7 - Groveton Parking Area								
	8h	white	brown	36"x12"	sq. wood (2)			Groveton
	9g	white	blue	8"x12"				tour #7; mounted on one post below
	37	white/gold	brown	18"x18"	sq. metal	low		Pay Park/Entrance Fee/At/Visitor Center
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only; mounted below
					sq. wood (2)			information board; roofed
					stone			interpretive plaque
Tour Site #8 - New York Monuments Parking Area								
	8i	white	brown	36"x12"	sq. wood (2)			New York/Monuments
	9h	white	blue	8"x12"				tour #8; mounted on one post below
	R7-5a	green	white	12"x18"	sq. metal			(2) signs; mounted a bit low
	13a	white	brown	10"x12"	rnd. metal			Private/Residence/No/Trespassing; set @ driveway to south
								interpretive plaque
					stone			(2) memorials with plaques
Tour Site #11 - Visitor Center Parking Lot								
	50	white	brown	24"x18"	sq. wood			All Visitors; portable
	51	cream	gold	18"x18"	entrance kiosk			U.S. Fee Area; mounted on top of kiosk
	52	white	brown	54"x48"				Park Entrance Fees ...; mounted on kiosk
	53	white	brown	18"x12"				Age 5(?) & Under/Admitted/Free; mounted on side of kiosk
	R7-8a	green/blue	white	12"x18"	sq. metal			(2) signs; set in front of parking stalls closest to building
				large	sq. wood (2)			(2) signs; welcome, brochure, information
	54			large	sq. wood (2)			Manassas National/Battlefield Park/National Park Service shield
								additional interpretive signs, cannons, statues, monuments, etc. away from parking area
Tour Site #12a - Stone Bridge (East) Handicapped Parking Access								
	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center
	R7-8a	green/blue	white	12"x18"	sq. metal			set in front of parking stall nearest path
Tour Site #12b - Stone Bridge Parking Area								
	7	black	white	40"x40"	rnd. metal			VA historic marker: C 23/The Stone Bridge

Manassas National Battlefield Park

Sign Inventory — Monday July 10, 1995

Internal Park Sites — T. Donaldson — revised 11/01/95

Map No.	Sign Type	Color Legend	Color Background	Size	Post	Height Offset	Condition	Comments
	36	white	brown	18"x24"	sq. metal			Park/Grounds/Open/Daylight/Hours Only
	37	white/gold	brown	18"x18"				Pay Park/Entrance Fee/At/Visitor Center
					sq. wood (2)			welcome, brochure, information
	45c,e	white/red	brown	6"x12"	wood gate			no horseback riding, no bikes; mounted on wood gate
	R8-3	red	white	12"x18"	wood gate			mounted on wood gate
	45a	white/red	brown	12"x12"	wood gate			no picnicking; mounted on wood gate
	55	white	brown	18"x8"	sq. wood	low		Additional Parking 100 Yards East; carved wood; mounted low
								trailhead sign set back off parking area
Tour Site #12c - Stone Bridge (West) Horse Trailer Parking								
	37	white/gold	brown	18"x18"	sq. metal			Pay Park/Entrance Fee/At/Visitor Center
	36	white	brown	18"x18"				Park/Grounds/Open/Daylight/Hours Only
	56	white	brown	24"x18"	sq. wood	low		Do Not Leave Valuables In Cars; carved wood; mounted low
					sq. wood (2)			equestrian brochure, information; roofed
	45b,e	white/red	brown	6"x12"	sq. wood			horseback riding ok, no bikes; set at beginning of horse trail
Stuart's Hill Parking Area								
	36	white	brown	18"x18"	sq. metal	low		Park/Grounds/Open/Daylight/Hours Only
	37	white/gold	brown	18"x18"				Pay Park/Entrance Fee/At/Visitor Center; mounted below
					sq. wood (2)			information, brochure display board
	R8-3	red	white	12"x18"	wood gate			mounted on wood gate
	45e	white/red	brown	8"x8"	md. wood			no bikes; set by gate
Portici House Site Parking Area								
	45c	white/red	brown	6"x6"	md. wood			no horseback riding; mounted on gate post
	45e	white/red	brown	6"x6"				no bikes; mounted on gate post
								trail plaque set behind gate

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Manassas National Battlefield Park

Sign Inventory — Tuesday July 11, 1995
External Park Guidance Signs — T. Donaldson — revised 04/24/96

Map No.	Sign Type	Color Legend	Color Background	Size	Legend	Location	Comments
Interstate 66 - Westbound							
X-1		white	brown	large	Manassas National Battlefield Park Exit 47B	approx. milepost 48	
X-2		white	green	large	Exit 47B VA 234 North Manassas National Battlefield Park	approx. milepost 47.5 @ beginning of exit ramp	mounted overhead
X-3		white	green	smalll	Community College Battlefield Park	halfway down exit ramp	
Interstate 66 - Eastbound							
X-4		white	brown	large	Manassas National Battlefield Park Exit 47	approx. milepost 46.2	
X-5		white	green	small	Community College Battlefield Park Manassas	approx. milepost 47 @ branch in exit ramp	
U.S. Highway 29 - Westbound							
X-6		white	brown		Bull Run Park Manassas Battlefield	approx. 2.2 miles east of jn. VA 235	separate panels, mounted on 2 sq. wood posts
U.S. Highway 29 - Eastbound							
X-7		black	white	40"x40"	(VA Historic Marker) Bull Run Battlefields	approx. 4 miles west of jn. VA 234	set in highway median
X-8		black	white	40"x40"	(VA Historic Marker) Second Battle of Manassas	approx. 3.5 miles west of jn. VA 234	set on RT side of EB lanes
X-9		?	?		(interpretive plaque)	approx. 2.9 miles west of jn. VA 234	set on RT side of WB lanes; rock base
Virginia Highway 28 - Northbound							
	none						
Virginia Highway 234 - Northbound							
X-10		white	brown	60"x30"	Battlefield Visitor Center	approx. 0.9 miles south of jn. US 29 (approx. 0.3 miles north of I-66)	mounted on 4.5" sq. wood post
X-11		white	brown	60"x30"	National Battlefield Park	approx. 0.8 miles south of jn. US 29 (approx. 0.4 miles north of I-66)	mounted on 4.5" sq. wood post
Virginia Highway 234 - Southbound							
	none						

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Manassas National Battlefield Park

Sign Inventory — Tuesday July 11, 1995
External Park Guidance Signs — T. Donaldson — revised 04/24/96

Manassas National Battlefield Park
MUTCD Standard Regulatory Signs

R1-1

R2-1

R2-5a

R3-4

R3-8a

R4-1

R4-7

R4-7a

R4-7c

R4-7d

R5-1

R5-5a

R5-9

R6-1L

R6-1R

R7-5a

R7-5b

R7-8a

R8-3

R8-3a

R10-6

R10-10a

Manassas National Battlefield Park

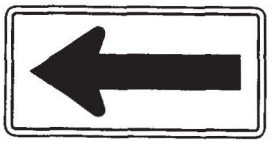
MUTCD Standard Warning Signs

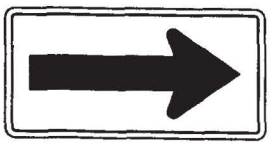
W1-1R

W1-2L

W1-2R

W1-3L


W1-6L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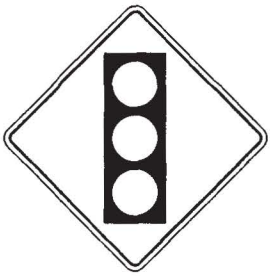
W2-1

W2-2L


W3-3

W4-2L

W6-1

W6-2

W7-3a

W8-5

W9-2R

W11-2

W11-3

W11-7

W13-1

W21-6a

OM-3R

Manassas National Battlefield Park
MUTCD Standard Guide Signs

M1-1

M1-4

M1-5

M3-1

M3-3

M4-5

M5-1L

M5-1R

M6-1L

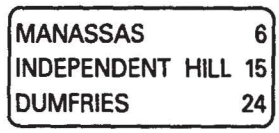
M6-1R

M6-3

D1-1a

D1-3

D2-1



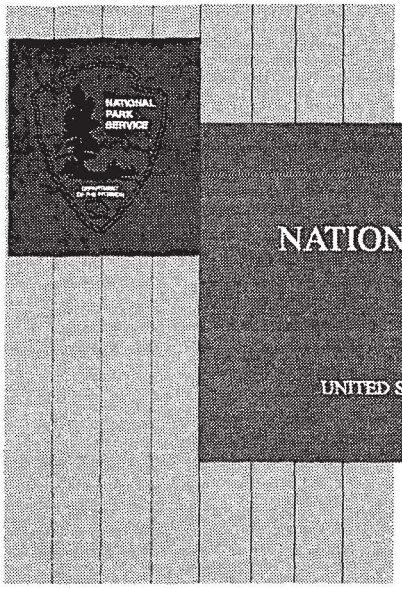
D2-3

D3

D4-2L

N7-1

Manassas National Battlefield Park
Non-Standard Sign Design Types & Identification Numbers



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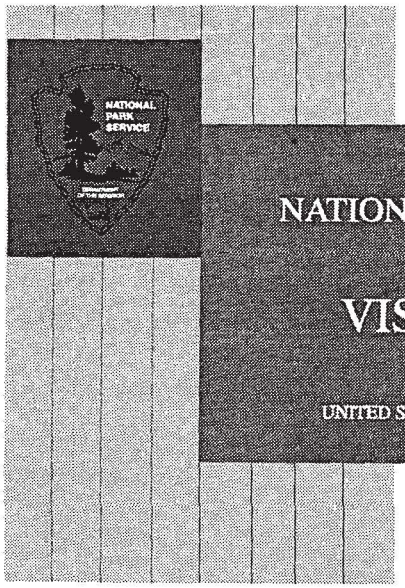

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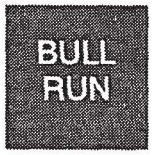
3a

3b

4



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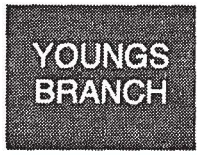

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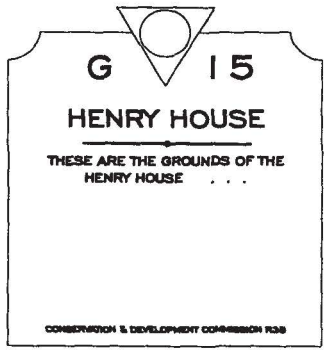
6a

6b



7

8a

8b

8c

8d

8e

8f

Manassas National Battlefield Park
Non-Standard Sign Design Types & Identification Numbers

Dogan Ridge 8g

Groveton 8h

New York Monuments 8i

1 9a 2 9b 3 9c

4 9d 5 9e 6 9f

7 9g 8 9h 9 9i

10 9j 12 9k TOUR 9l

TOUR 9m

10

HORSEBACK RIDING PROHIBITED 11

SNOW EMERGENCY ROUTE
NO PARKING OR IMPEDING TRAFFIC FLOW DURING EMERGENCY TOWING ENFORCED 12

Private Residence No Trespassing 13a

Private Residence 13b

SUDLEY RD NEXT SIGNAL 14a

LEE HWY NEXT SIGNAL 14b

MANASSAS PKWY NEXT SIGNAL 14c

← NORTHERN VA COMM COLL 15a

NORTHERN VA COMM COLL → 15b

← MANASSAS NAT BATTLEFIELD PARK 16a

MANASSAS NAT BATTLEFIELD PARK → 16b

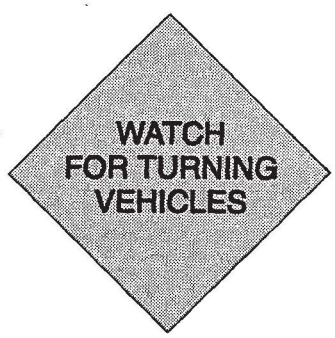
ADVANCED GREEN SIGNAL MON - FRI 3:30PM-6:30PM 17a

DELAYED GREEN SIGNAL MON-FRI 3:30PM-6:30PM 17b

THE 29TH INFANTRY DIVISION MEMORIAL HIGHWAY 18

LEE HIGHWAY 19

Groveton Cemetery
Dogan House Parking 20



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Manassas National Battlefield Park
Non-Standard Sign Design Types & Identification Numbers

22

26b

27a

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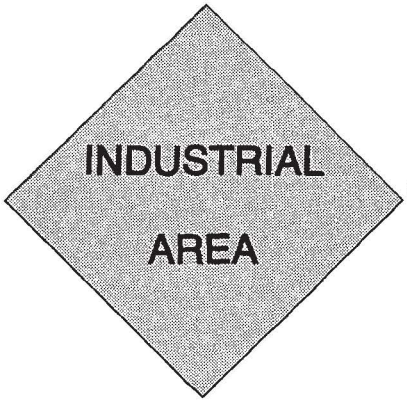

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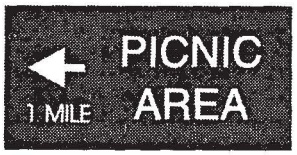

27b

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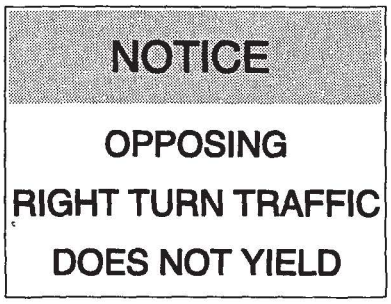

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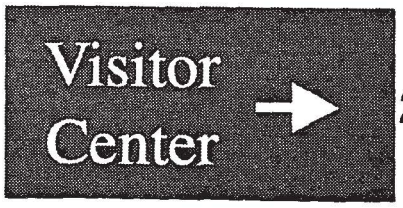

26a

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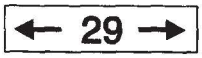
31a

31b

32

33a



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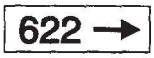
33d



33e

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W35

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Manassas National Battlefield Park

Non-Standard Sign Design Types & Identification Numbers

37

38a

38b

38c

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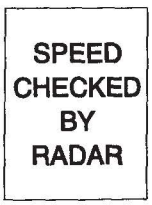

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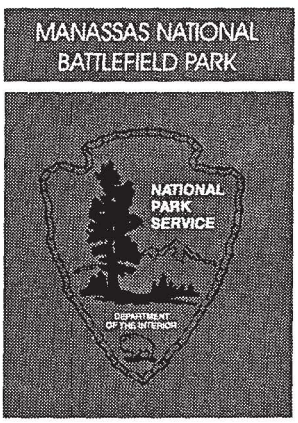

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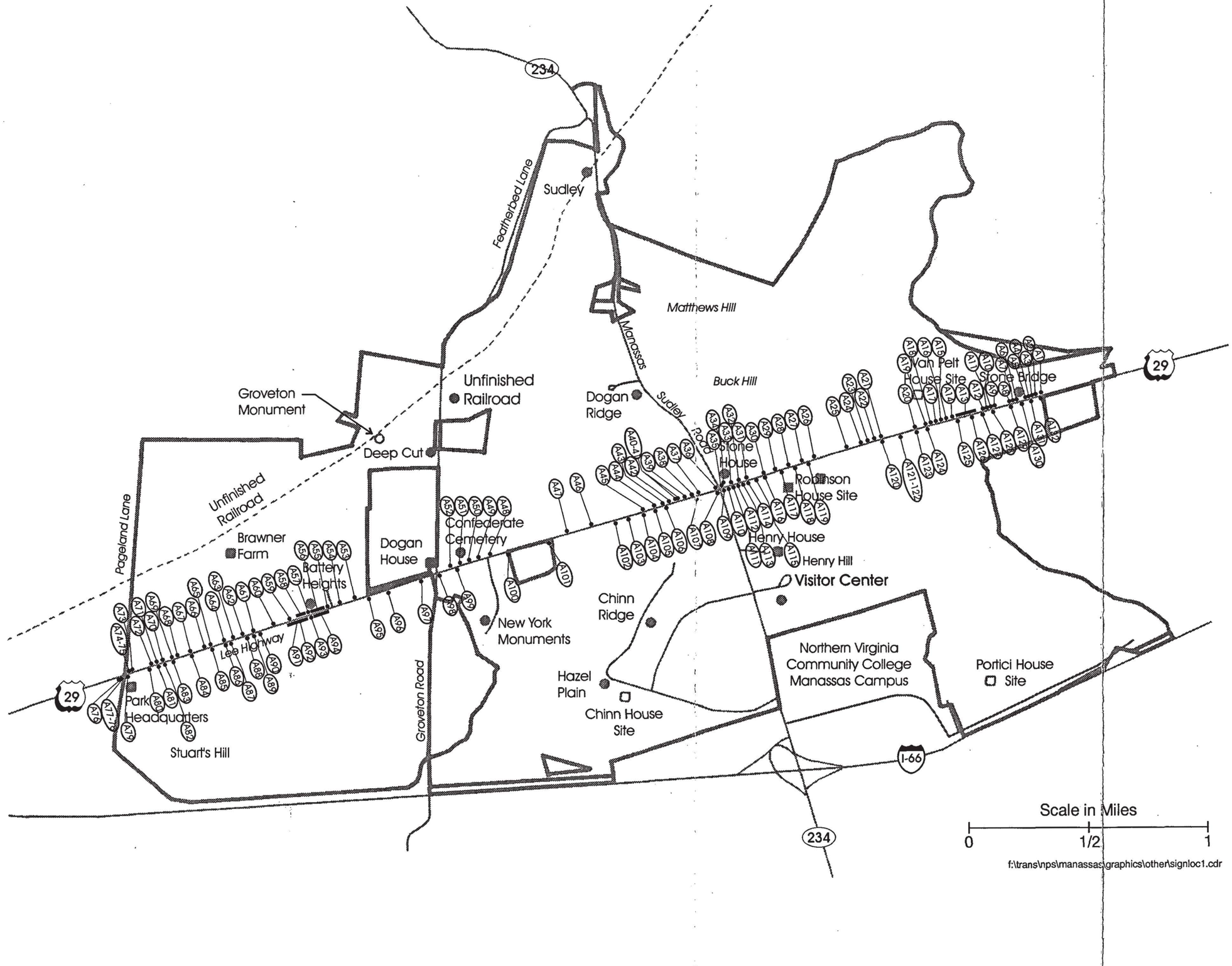
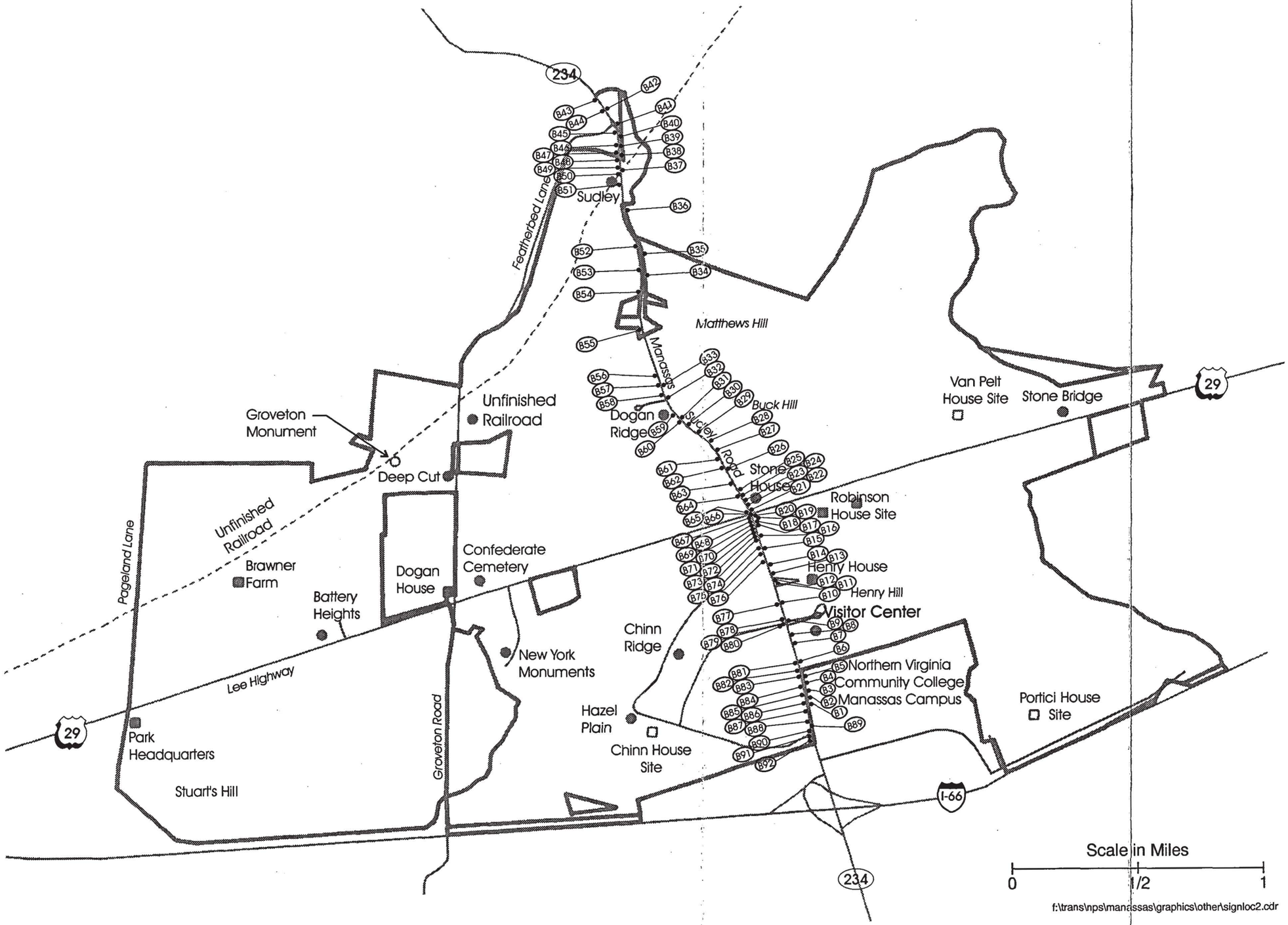
Sign Location Map-U.S. Highway 29

Manassas National Battlefield Park, Transportation Study



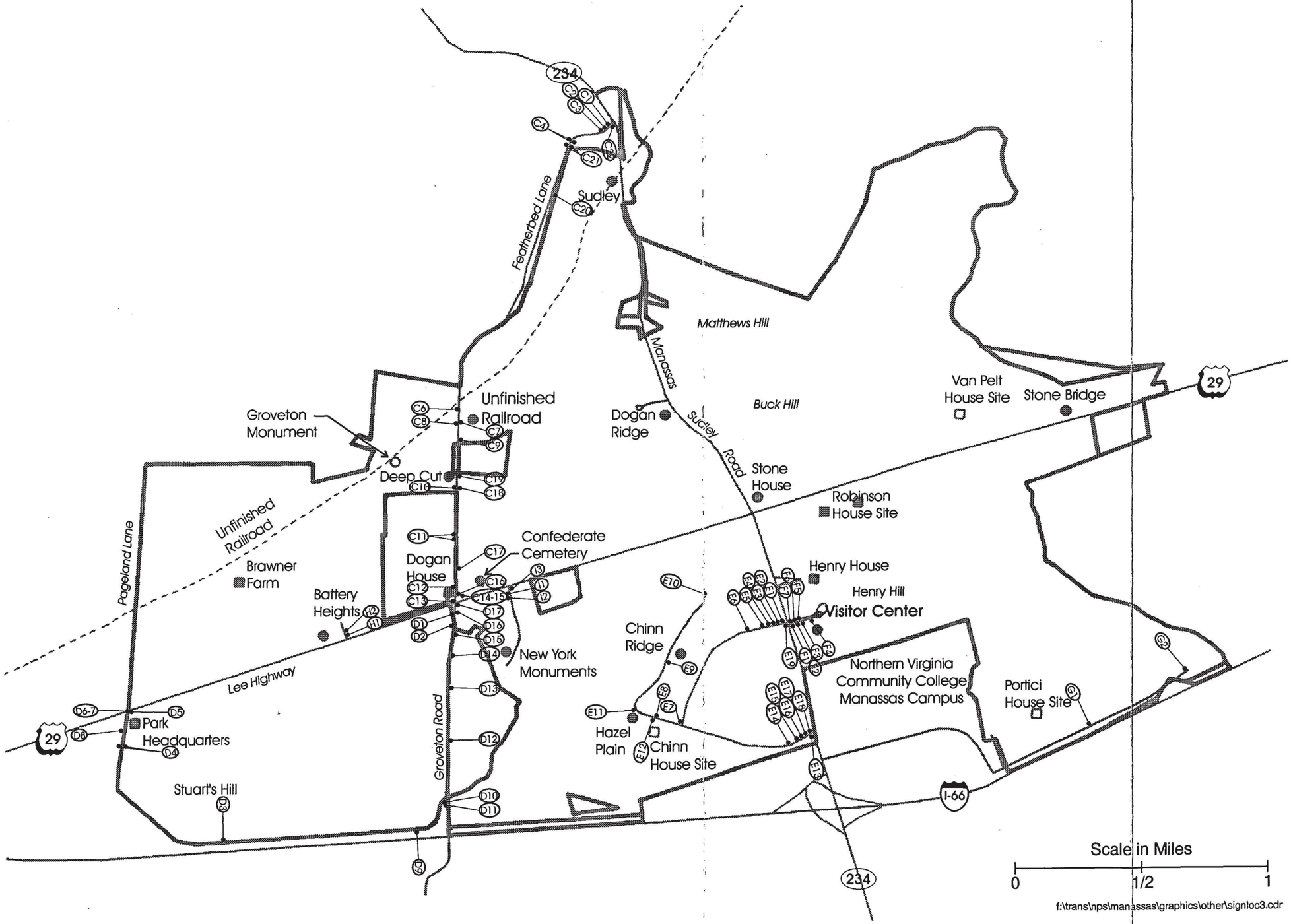


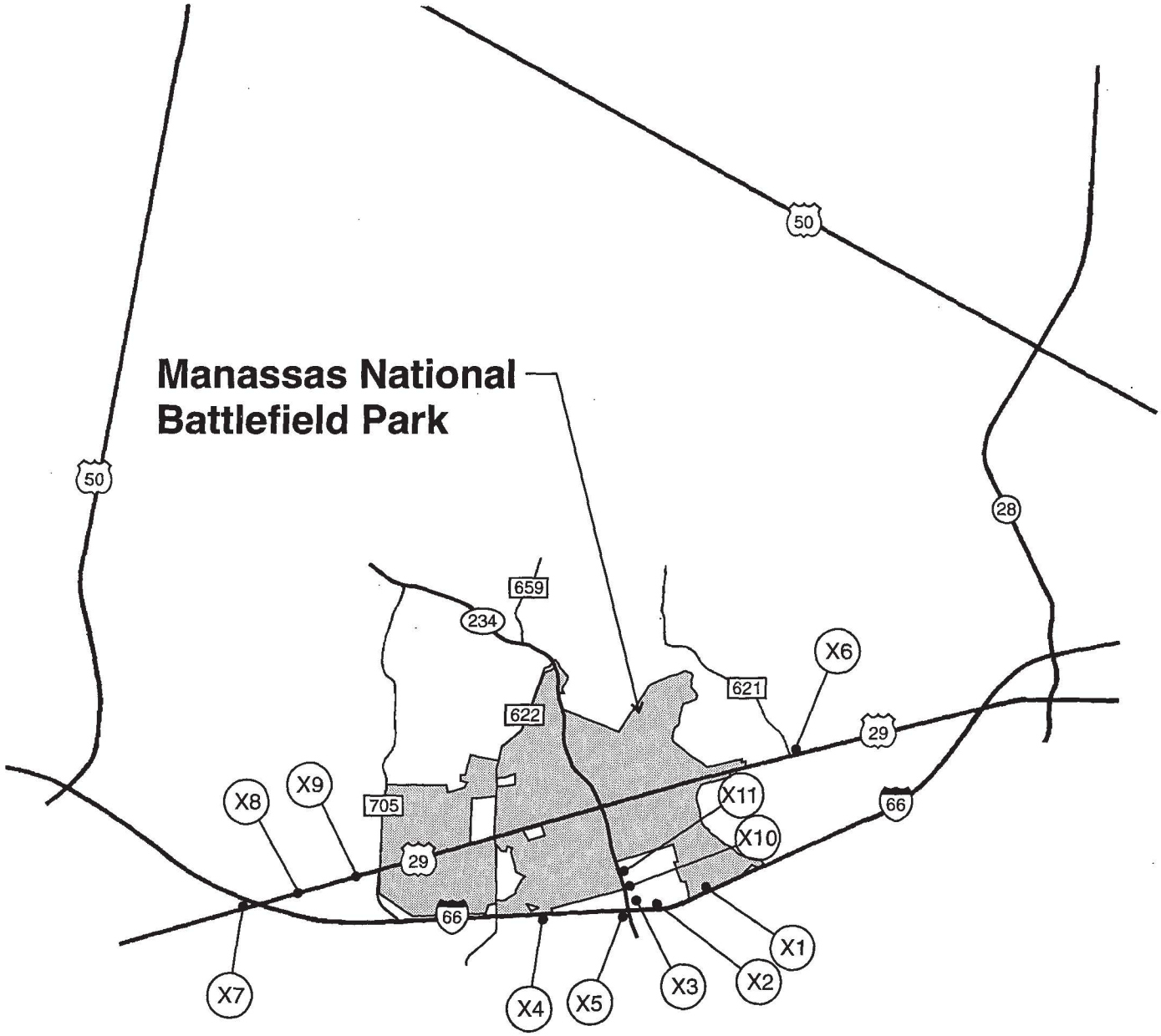
Sign Location Map-VA Highway 234

Manassas National Battlefield Park, Transportation Study

Sign Location Map-Other Park Roads

Manassas National Battlefield Park, Transportation Study





Sign Location Map - External to Park

Manassas National Battlefield Park, Transportation Study