

JUNE 2004 TRAFFIC STUDY FOR ROCK CREEK PARK, WASHINGTON, D.C.

FINAL

Prepared for the

**NATIONAL PARK SERVICE
DENVER SERVICE CENTER**

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Prepared by

PARSONS

Joseph S. Springer

1133 15th Street N.W.
Washington, D.C. 20005
Phone: 202-775-3300

1700 Broadway, Suite 900
Denver, Colorado 80290
Phone: 303-831-8100

TABLE OF CONTENTS

	Page
Section 1 Traffic Counts	1-1
Introduction.....	1-1
Beach Drive Traffic Counts, June 2004.....	1-1
Comparison to Traffic Counts in the 1997 Robert Peccia and Associates Report.....	1-7
Section 2 Analysis of Traffic Patterns and Trends.....	2-1
Percentage of Traffic Exiting the Park on Military Road, Broad Branch Road, and Blagden Avenue...	2-1
Methods of Determining Travel Patterns.....	2-2
Conduct of a License Match Survey.....	2-2
Determination of Current Travel Times	2-6
Trip Pattern Analysis Method	2-6
Existing Travel Patterns.....	2-9
Traffic Effects from the Closure of Beach Drive if All Traffic Diverts to Non-Park Roads	2-12
Traffic Effects from the Closure of Beach Drive if Some Traffic Diverts to Ross Drive/Glover Road	2-16
Changes in Levels of Service Resulting from the Closure of Beach Drive	2-18
Conclusions.....	2-20
References Cited.....	R-1
Appendices	
A - Traffic Patters Leaving Rock Creek (Selected Stations)	A-1
B - Travel Speeds as Determined from June 2004 Travel Time runs	B-1
C - Potential Travel Routes Between Zones (Based on June 2004 Travel Time Data.....	C-1
D - Routes Where Trips from Beach Drive Would Divert (Results of Calculations)	D-1

TABLE OF CONTENTS

LIST OF EXHIBITS

No.	Title	Page
1-1	Traffic Count Stations and June 2004 Traffic Volumes.....	1-2
1-2	Traffic Count Locations.....	1-3
1-3	Daily Traffic Variation by Day of Week at Station 1 (Beach Drive South of Blagden Avenue).....	1-4
1-4	Daily Traffic Variation by Day of Week at Station 4 (Beach Drive North of Broad Branch Road).....	1-4
1-5	Daily Traffic Variation by Day of Week at Station 12 (Beach Drive North of Joyce Road).....	1-5
1-6	Hourly Traffic Distribution by Day of Week at Station 1 (Beach Drive South of Blagden Avenue).....	1-5
1-7	Hourly Traffic Distribution by Day of Week at Station 4 (Beach Drive North of Broad Branch Road).....	1-6
1-8	Hourly Traffic Distribution by Day of Week at Station 12 (Beach Drive North of Joyce Road).....	1-6
1-9	August 1996 Traffic Volumes at Locations That Can Be Compared with June 2004 Volumes	1-7
1-10	Comparison of 1996 and 2004 Traffic Volumes.....	1-8
2-1	Survey Station Locations	2-3
2-2	Observed Vehicles at Survey Stations	2-4
2-3	State of Registration for Observed Vehicles ^{a/}	2-4
2-4	Travel Time Corridors	2-7
2-5	Origin-Destination Zones.....	2-8
2-6	Morning Trip Table of Vehicle Trips during the 2-Hour Period	2-10
2-7	Mid-Day Trip Table of Vehicle Trips during the 5-Hour Period.....	2-10
2-8	Afternoon Trip Table of Vehicle Trips during the 2-Hour Period	2-10
2-9	Locations Where Trips Enter the Rock Creek Park Study Area by Percent	2-11
2-10	Locations Where Trips Exit the Rock Creek Park Study Area by Percent	2-11
2-11	Summary of Trip Destinations.....	2-13
2-12	Trip Interchanges with Limited Use of Beach Drive between Broad Branch and Joyce Roads	2-14
2-13	Mid-Day Trips – Potential Pool of Diverted Trips	2-15
2-14	Projected Increases in Traffic Volumes on Road Segments Based on the Potential Mid-Day Closure of Beach Drive.....	2-17
2-15	Roadway Operations Summary – Existing Conditions.....	2-19
2-16	Expected Traffic and Operations Change Resulting from Mid-Day Closure of Beach Drive	2-20

SECTION 1

TRAFFIC COUNTS

INTRODUCTION

This section represents the deliverable associated with Task 3 of the scope of services for the Rock Creek Park and Rock Creek and Potomac Parkway transportation study performed by Parsons for the National Park Service (NPS), Denver Service Center. It describes traffic counts conducted by Parsons in early June 2004 and provides a comparison with the *Transportation Study: Rock Creek Park, Washington, D.C.* by Robert Peccia and Associates (1997). These counts and the license plate survey and analyses described in Section 2 were conducted to provide current information on traffic volumes and flow patterns in the south part of the park so that the alternatives for park management can be responsive to current conditions.

A general management plan and environmental impact statement (GMP/EIS) is being produced for Rock Creek Park. The GMP will provide broad guidance for the park's long-term management and direct future uses in the areas of resource management, recreation, and interpretation. As part of this project, the NPS is evaluating current traffic operations affecting the park.

A transportation study was conducted by Robert Peccia and Associates in 1997 to provide data about the park's traffic for use in developing the GMP/EIS. Because of the age of the data, it was important to verify and supplement the findings of the Robert Peccia and Associates study. This section provides a summary of traffic counts performed in support of these efforts.

BEACH DRIVE TRAFFIC COUNTS, JUNE 2004

Between June 1 and 10, 2004, Parsons performed traffic counts using automated traffic count machines at 17 locations in and near Rock Creek Park. The locations of these counts are described in Exhibit 1-1 and are mapped in Exhibit 1-2. Using standard pneumatic traffic count machines and roadway tubes, traffic was counted for a consecutive 7-day period at each count station. Exhibit 1-1 summarizes the traffic counts at each location.

Three of the 17 count locations were on Beach Drive. Station 1 was located south of Blagden Avenue, Station 4 was located north of Broad Branch Road, and Station 12 was located north of Joyce Road.

The traffic volumes at these locations ranged from 5,100 vehicles per day between Broad Branch Road and Joyce Road (Station 4) to more than 15,000 vehicles per day south of Blagden Avenue. As shown in Exhibits 1-3 through 1-5, daily traffic volumes vary little within the Monday to Friday workweek at all three stations. Traffic volumes decrease substantially at all three stations during the weekends when three sections of Beach Drive are closed to motorized vehicles.

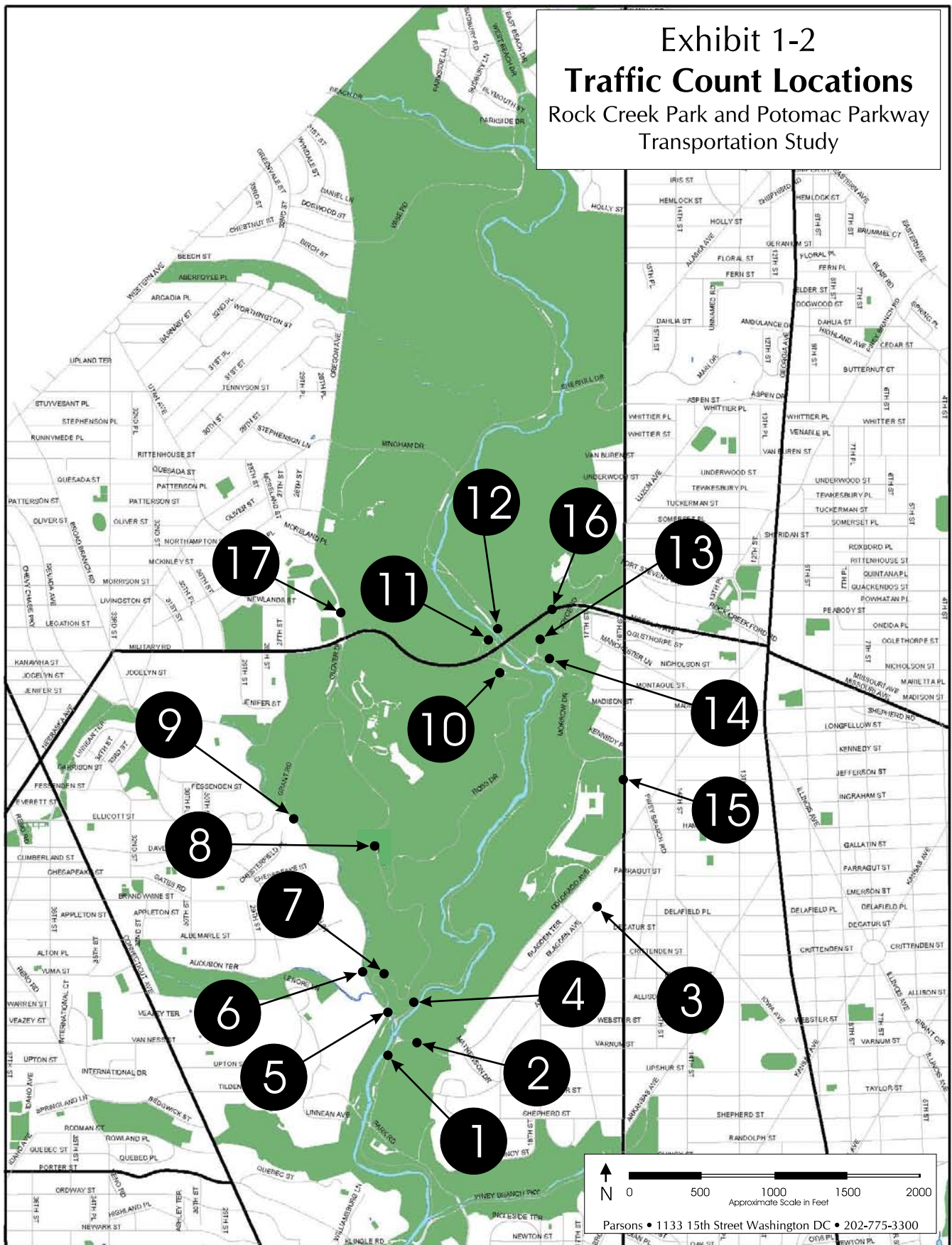
EXHIBIT 1-1: TRAFFIC COUNT STATIONS AND JUNE 2004 TRAFFIC VOLUMES

Count Station Number	Description of Count Location	Traffic Counts				
		Overall Daily Traffic	Weekend Daily Traffic	Weekday Daily Traffic	A.M. Peak Hour	P.M. Peak Hour
1	Beach Drive south of Blagden Avenue	15,090	10,428	16,972	1,183	1,420
2	Blagden Avenue east of Beach Drive	4,971	4,579	5,142	435	371
3	Blagden Avenue between Beach Drive and 16 th Street	7,385	6,579	7,736	665	604
4	Beach Drive north of Broad Branch Road	5,106	1,615	6,579	429	666
5	Broad Branch Road south of Glover Road	7,661	6,881	7,999	568	760
6	Broad Branch Road north of Glover Road	7,077	5,986	7,541	594	700
7	Glover Road south of Ross Drive	930	1,328	795	56	71
8	Glover Road north of Ross Drive	651	953	546	42	45
9	Broad Branch Road south of Grant Road	3,455	2,693	3,786	285	338
10	Ross Drive south of Joyce Road/ Old Military Road	367	473	337	26	22
11	Military Road on/off ramp at the Beach Drive intersection	656	600	689	56	64
12	Beach Drive north of Joyce Road	5,636	888	7,556	677	797
13	Joyce Road east of Beach Drive	955	616	1,127	91	105
14	Morrow Drive south of Joyce Road	1,891	792	2,358	359	253
15	16 th Street between Military Road and Blagden Avenue	31,637	26,341	33,772	2,766	2,797
16	Military Road between Oregon Avenue and 16 th Street	31,647	21,531	35,763	3,357	2,816
17	Oregon Avenue between Military Road and Northampton Street	4,529	4,058	4,755	450	404

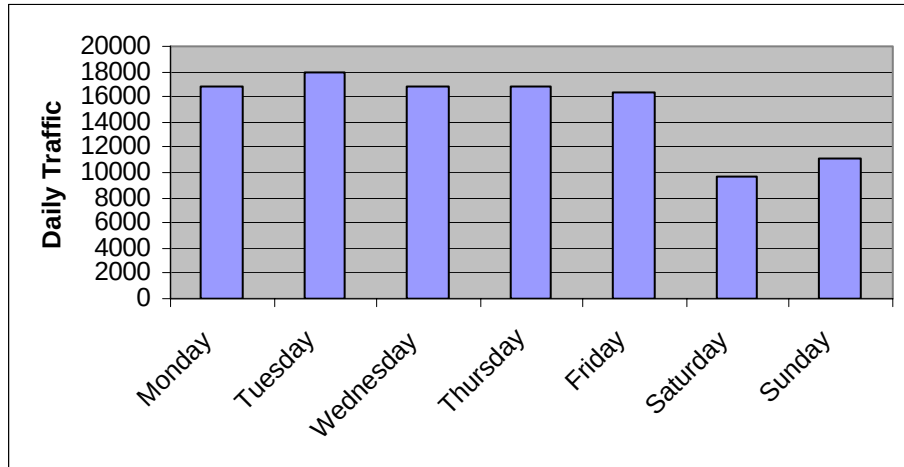
Exhibit 1-2

Traffic Count Locations

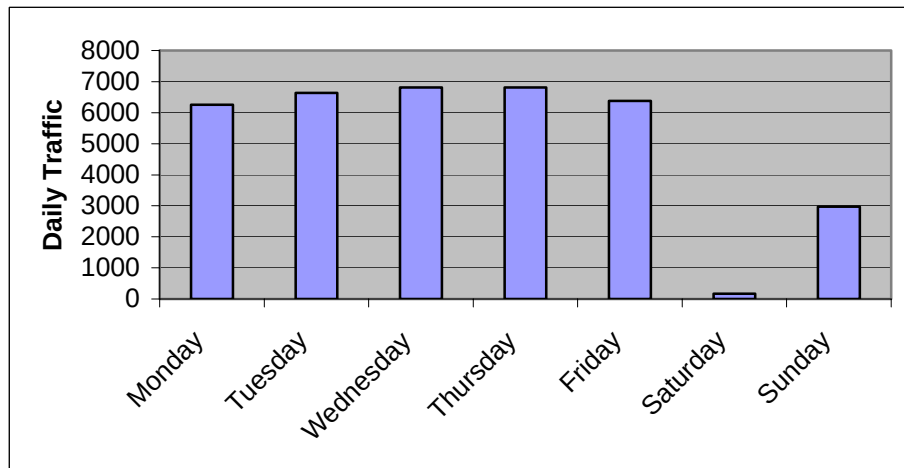
Rock Creek Park and Potomac Parkway
Transportation Study



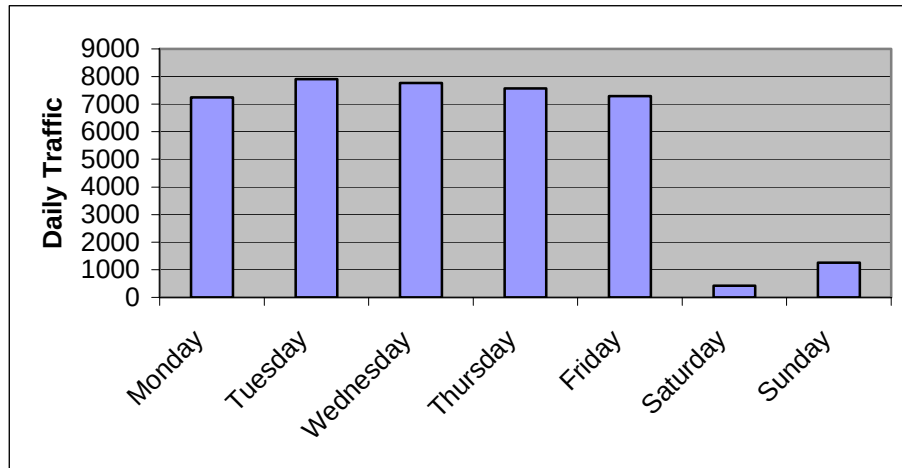
**EXHIBIT 1-3: DAILY TRAFFIC VARIATION BY DAY OF WEEK AT
STATION 1 (BEACH DRIVE SOUTH OF BLAGDEN AVENUE)**



**EXHIBIT 1-4: DAILY TRAFFIC VARIATION BY DAY OF WEEK AT
STATION 4 (BEACH DRIVE NORTH OF BROAD BRANCH ROAD)**

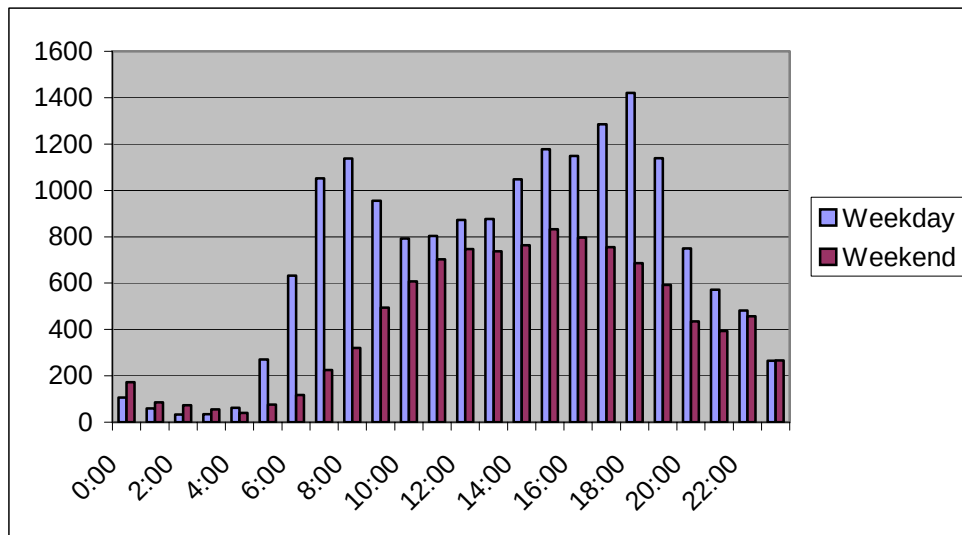


**EXHIBIT 1-5: DAILY TRAFFIC VARIATION BY DAY OF WEEK AT
STATION 12 (BEACH DRIVE NORTH OF JOYCE ROAD)**

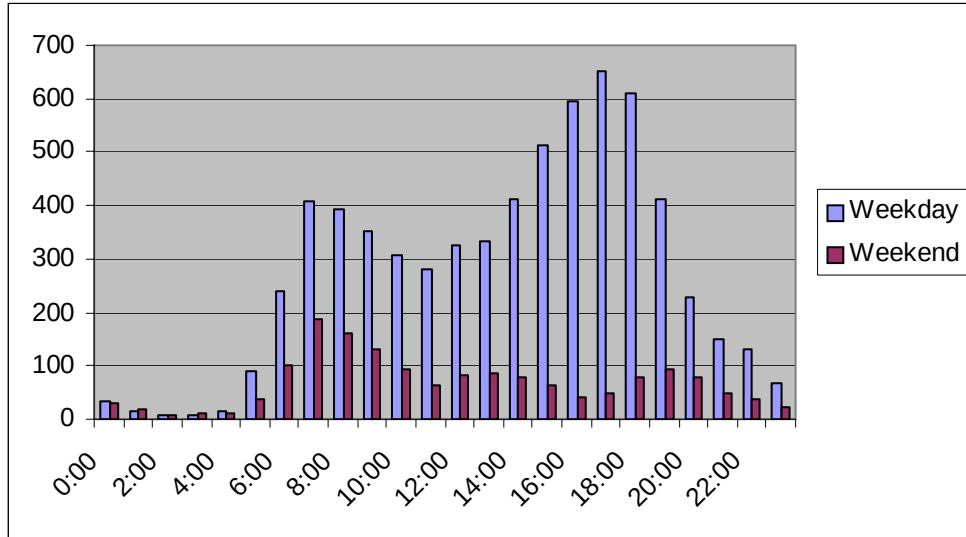


Hourly traffic numbers by time of day for weekdays and weekends for the three Beach Drive count locations are shown in Exhibits 1-6 through 1-8. By time of day, traffic volumes at all three count stations on Beach Drive follow typical weekday patterns, with two daily peak periods associated with commuters traveling to and from work. At all three stations, the weekday hour with the highest traffic volume occurs in the afternoon.

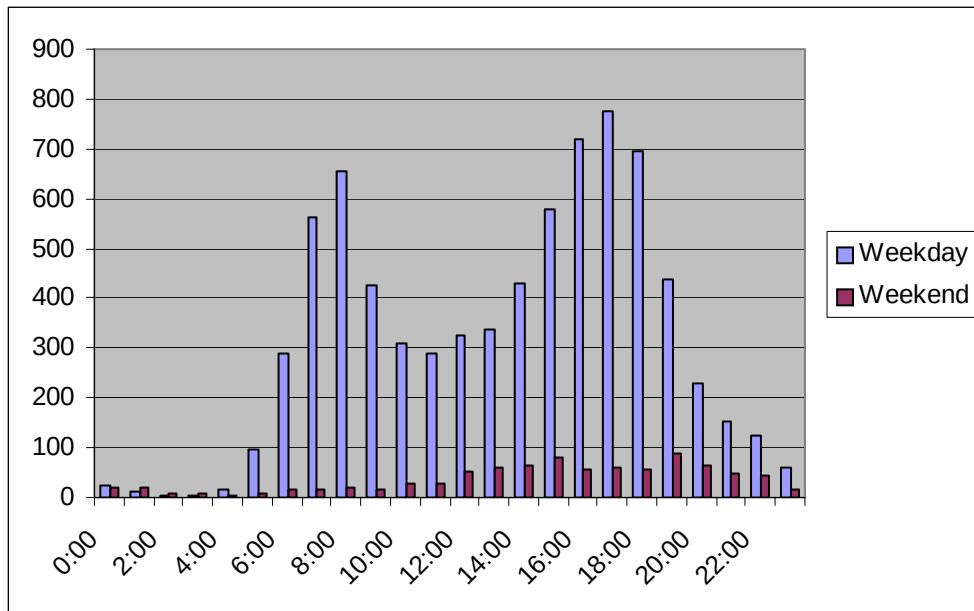
**EXHIBIT 1-6: HOURLY TRAFFIC DISTRIBUTION BY DAY OF WEEK AT
STATION 1 (BEACH DRIVE SOUTH OF BLAGDEN AVENUE)**



**EXHIBIT 1-7: HOURLY TRAFFIC DISTRIBUTION BY DAY OF WEEK AT
STATION 4 (BEACH DRIVE NORTH OF BROAD BRANCH ROAD)**



**EXHIBIT 1-8: HOURLY TRAFFIC DISTRIBUTION BY DAY OF WEEK AT
STATION 12 (BEACH DRIVE NORTH OF JOYCE ROAD)**



COMPARISON TO TRAFFIC COUNTS IN THE 1997 ROBERT PECCIA AND ASSOCIATES REPORT

The 1997 Robert Peccia and Associates report included traffic counts on Beach Drive north of Joyce Road, along with several other roads in and immediately adjacent to Rock Creek Park. Eight of the locations in the 1997 report are at locations that can be compared to the counts performed for the 2004 analysis. The traffic counts in the Robert Peccia and Associates report, which were collected in August of 1996, are shown in Exhibit 1-9. To allow for comparison with the counts performed for this analysis, the locations for the 1996 counts in Exhibit 1-9 are shown using this current study's station numbering.

**EXHIBIT 1-9: AUGUST 1996 TRAFFIC VOLUMES AT LOCATIONS
THAT CAN BE COMPARED WITH JUNE 2004 VOLUMES^{a/}**

2004 Count Station Number	DESCRIPTION OF COUNT LOCATION	1996 Traffic Counts				
		Overall Daily Traffic	Weekend Daily Traffic	Weekday Daily Traffic	A.M. Peak Hour	P.M. Peak Hour
3	Blagden Avenue between Beach Drive and 16 th Street	6,598	6,624	6,585	490	532
5	Broad Branch Road south of Glover Road	14,913	14,692	15,356	1,171	1,289
7	Glover Road south of Ross Drive	942	1,551	536	55	57
11	Military Road on/off ramp at the Beach Drive intersection	1,347	1,820	1,110	80	285
12	Beach Drive north of Joyce Road	6,527	2,226	8,677	699	1,023
13	Joyce Road east of Beach Drive	1,013	1,113	969	67	155
14	Morrow Drive south of Joyce Road	1,351	871	1,573	244	186
17	Oregon Avenue between Military Road and Northampton Street	3,243	3,213	3,264	366	332

a/ Source: Robert Peccia and Associates 1997.

Exhibit 1-10 shows the differences between the counts recorded in June 2004 and the counts recorded in August 1996.

- Three of the eight locations experienced substantial increases in overall daily traffic volumes. They included 2004 Station 3 (12 percent increase), Station 14 (40 percent increase), and Station 17 (40 percent increase).
- Glover Road (Station 7) and Joyce Road (Station 13) showed decreases in overall daily traffic, but the declines of 1 percent and 6 percent, respectively, were small enough to be within normal variation. These data indicate that the traffic at these locations is essentially the same.

EXHIBIT 1-10: COMPARISON OF 1996 AND 2004 TRAFFIC VOLUMES

Count Station Number	Description of Count Location	Difference between 1996 and 2004 Traffic Counts ^{a/}				
		Overall Daily Traffic	Weekend Daily Traffic	Weekday Daily Traffic	A.M. Peak Hour	P.M. Peak Hour
3	Blagden Avenue between Beach Drive and 16 th Street	787	-45	1,151	175	72
5	Broad Branch Road south of Glover Road	-7,252	-7,811	-7,357	-603	-529
7	Glover Road south of Ross Drive	-12	-223	259	1	14
11	Military Road on/off ramp at the Beach Drive intersection	-691	-1,220	-421	-24	-221
12	Beach Drive north of Joyce Road	-891	-1,338	-1,121	-22	-226
13	Joyce Road east of Beach Drive	-58	-497	158	24	-50
14	Morrow Drive south of Joyce Road	540	-79	785	115	67
17	Oregon Avenue between Military Road and Northampton Street	1,286	845	1,491	84	72

a/ Values represent the 2004 count minus the 1996 count. A negative number means that the reported 1996 traffic volume was higher than the 2004 traffic volume.

- Both the Military Road ramp to/from Beach Drive (Station 11) and Beach Drive north of Joyce Road (Station 12) experienced decreases in traffic. Overall daily traffic on the Military Road ramp decreased by 51 percent (a 67 percent decrease on the weekends), while overall daily traffic decreased on Beach Drive north of Joyce Road by 14 percent (with a 60 percent decrease on the weekends).
- Broad Branch Road, at Station 5, showed decreases of more than 7,250 vehicles per day across the whole week (a 49 percent decrease) and more than 7,800 vehicles per day on the weekend (a 53 percent decrease). These values are noteworthy because of the large number of vehicles involved.

Daily counts available from the District of Columbia Department of Transportation (DDOT) show approximately 6,800 vehicles per day on Broad Branch Road in 2001. Based on the DDOT and Parsons values, the figures of around 15,000 vehicles per day provided in the Robert Peccia and Associates (1997) report for this road appear to be an anomaly or are shown incorrectly in the report.

All of the traffic counts performed for this analysis were compared with DDOT data for the year 2001 (most recent counts available on the DDOT website). DDOT data are not available for roads within Rock Creek Park. Where data for comparable locations were available, the 2004 traffic counts were consistent with DDOT data.

SECTION 2

ANALYSIS OF TRAFFIC PATTERNS AND TRENDS

This section represents the deliverable associated with Task 4 of the scope of services for the Rock Creek Park and Rock Creek and Potomac Parkway transportation study performed by Parsons for the National Park Service, Denver Service Center. It:

- Summarizes the percentage of traffic exiting the park on Military Road, Broad Branch Road, and Blagden Avenue;
- Describes the methods and results of a license match survey;
- Identifies current patterns of vehicles traveling through Rock Creek Park on Beach Drive based on the license match survey;
- Evaluates the effects that mid-day closures of Beach Drive between Broad Branch Road and Joyce Road would have on traffic on other roads in the vicinity of the park; and
- Analyzes changes in the levels of service on nearby roads that would result from mid-day closures of Beach Drive between Broad Branch Road and Joyce Road.

PERCENTAGE OF TRAFFIC EXITING THE PARK ON MILITARY ROAD, BROAD BRANCH ROAD, AND BLAGDEN AVENUE

Data were developed on the percent of total vehicles that currently leave the park on three roads, including Military Road, Broad Branch Road, and Blagden Avenue, during the workday. This analysis started with the 7:00 hour (7:00 a.m.) and terminating at the end of the 18:00 hour (6:59 p.m.). These values are included in Appendix A. As shown in the appendix:

- Most traffic throughout the day leaves the park on Military Road. From 7:00 a.m. until 3:00 p.m., the Military Road exits account for approximately 60 percent of the traffic leaving the park. For the four hours starting at 3:00 p.m., about 70 percent of the traffic leaving the park exits on Military Road eastbound or westbound.
- There is more westbound traffic on Military Road in the morning and more eastbound traffic on this road in the afternoon.
- Broad Branch Road and Blagden Avenue each carry a higher proportion of the traffic exiting the park in the morning than in the afternoon.
- Percentages of traffic using Broad Branch Road are relatively constant, between 10 percent and 12 percent, from 7:00 a.m. until early afternoon. Starting at 2:00 p.m. and throughout the evening commute, Broad Ranch Road carries about 5 percent of the traffic exiting the park.
- During the morning rush hour until 9:00 a.m., about 6 percent of the traffic exits the park via Blagden Avenue. Throughout the remainder of the day, it carries less than 2 percent of the traffic exiting the park.

METHODS OF DETERMINING TRAVEL PATTERNS

To assess the potential traffic impacts of closing Beach Drive between Broad Branch and Joyce Roads during the mid-day period, it was necessary to quantify travel patterns of drivers who use this section of Rock Creek Park. The limits of the travel pattern analysis study area extended from just north of Piney Branch Parkway on the south to the Maryland border on the north. However, the impacts of traffic diversions that could result from the potential mid-day closure of Beach Drive were considered beyond this study area and included reasonable alternate routes in both the District of Columbia and Maryland.

Conduct of a License Match Survey

A license match survey was performed to assess the travel patterns for drivers who use roadways in Rock Creek Park, with a focus on Beach Drive south of Military Road. Seven survey stations were set up at the periphery of the park between south of Blagden Avenue on the south and the Maryland border on the north. The survey stations locations are illustrated in Exhibit 2-1.

Vehicle types (car or truck) and license plates were recorded at each of the seven survey stations shown on Exhibit 2-1 on a typical weekday (Tuesday, June 8, 2004) in both directions. The survey was conducted for 10 hours between 7:30 a.m. and 5:30 p.m.

“Cars” included all types of motorized, four-wheeled vehicles that were used to transport individuals, their passengers, and their personal and professional equipment and belongings. These included sedans, station wagons, sport utility vehicles, vans, and pickup trucks. Use for commercial purposes was not relevant; vans or pickups marked with business names and taxis all were classified as cars.

“Trucks” were vehicles larger than pickups, such as panel trucks and delivery-type vehicles, plus all vehicles with six or more wheels.

For each vehicle that passed through a survey station, the observer would first record whether the vehicle was a car or truck based on the definitions provided above, would next attempt to record the license plate number, and would then determine the state in which the vehicle was registered. As a result, the Exhibit 2-2 data on numbers and types (car or truck) of vehicles have a high level of accuracy while the state of registration (Exhibit 2-3) was secured only on about 80 percent of the vehicles. The survey results show that:

- On the 10-hour survey day, 44,971 vehicles were recorded as entering or exiting the park at one of the seven survey station locations.
- More than half of all vehicles going through the seven stations entered or exited the park at Station 4 on Military Road on the west side of the park (27 percent) or Station 5 on Military Road on the east side of the park (26 percent). Traffic at the other stations ranged from 7 percent to 13 percent of the total number of vehicles recorded entering or exiting the park.
- Of the 35,223 vehicles for which a state of registration was recorded, 47 percent were from Maryland, 42 percent were from Washington, D.C., and 8 percent were from Virginia. No other state represented more than 0.3 percent of the traffic.

Exhibit 2-1

License Survey Stations

Rock Creek Park and Potomac Parkway
Transportation Study

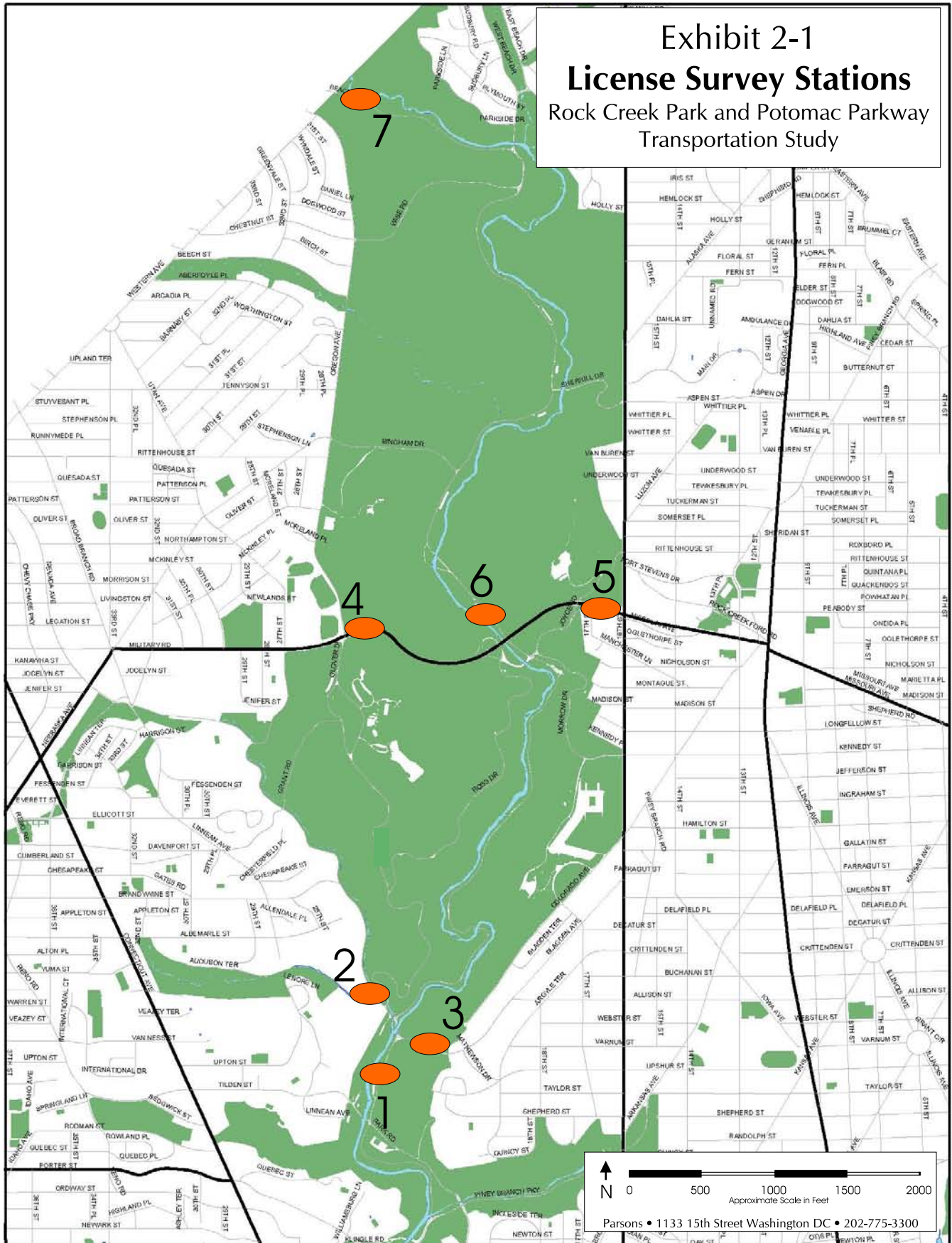


EXHIBIT 2-2: OBSERVED VEHICLES AT SURVEY STATIONS

Station Number	Entering Park			Exiting Park			Totals			
	Car Volume	Truck		Car Volume	Truck		Car Volume	Truck		All Vehicles
		Volume	%		Volume	%		Volume	%	
1	2,730	171	5.9%	2,993	175	5.5%	5,723	346	5.7%	6,069
2	2,020	51	2.5%	1,922	55	2.8%	3,942	106	2.6%	4,048
3	1,342	68	4.8%	2,077	50	2.4%	3,419	118	3.3%	3,537
4	5,869	357	5.7%	5,705	332	5.5%	11,574	689	5.6%	12,263
5	5,652	765	11.9%	4,421	705	13.8%	10,073	1,470	12.7%	11,543
6	2,003	48	2.3%	2,213	52	2.3%	4,216	100	2.3%	4,316
7	1,487	37	2.4%	1,647	24	1.4%	3,134	61	1.9%	3,195
Totals	21,103	1,497	6.6%	20,978	1,393	6.2%	42,081	2,890	6.4%	44,971
1, 2, 3, 6, and 7	9,582	375	3.8%	10,852	356	3.2%	20,434	731	3.5%	21,165

EXHIBIT 2-3: STATE OF REGISTRATION FOR OBSERVED VEHICLES ^{a/}

State	Survey Station							
	1	2	3	4	5	6	7	Totals
Maryland	2,525	1,014	1,090	3,006	5,737	1,523	1,810	16,705
District of Columbia	2,467	2,479	1,957	2,239	4,203	770	659	14,774
Virginia	659	285	300	460	745	292	203	2,944
New Jersey	8	7	5	15	61	4	0	100
New York	23	11	4	14	25	6	8	91
Florida	11	7	4	9	27	11	13	82
Pennsylvania	15	2	2	21	24	8	9	81
All other states ^{b/}	99	49	32	72	125	23	46	446
Unknown/not captured	262	194	143	6,427	596	1,679	447	9,748

a/ Based on license plate.

b/ Includes all states where 50 or fewer license plates from the jurisdiction were observed at all survey seven stations.

Park regulations prohibit the use of trucks (those larger than pickups) on park roads. This restriction does not apply to Military Road, a city road that passes through Rock Creek Park. As shown in Exhibit 2-2:

- More than 6 percent of all vehicles recorded during the survey were trucks. However, 75 percent of these were on Military Road, which carried about 53 percent of all traffic.
- At the other five survey points, trucks represented 3.5 percent of all vehicles and ranged from 1.9 to 5.7 percent of the vehicles recorded.
- A candidate site for enforcement actions would be Beach Drive between Tilden Street and Blagden Avenue, where 5.7 percent of the recorded vehicles were trucks.
- It may be useful to monitor truck traffic on Military Road at the east side of the park. Station 5 at this location had more than twice the percentage of trucks *both entering and exiting* of any other license survey location, including Military Road on the west side of the park. One explanation would be that trucks entering the park from the east on Military Road turn around within the park and exit using the same route. However, this is more likely a funnel point at which trucks enter the park and then disperse on park roads to the north, west, and south, while a similar number of trucks converge from several routes within the park and take Military Drive to destinations to the east.

The license plates were entered into a computer database and matched to determine the access and egress locations of trips that went through the park. Factors that limited the numbers of matches included the following.

- There are 24 road entrances to Rock Creek Park and traffic survey stations were located only at seven (albeit major) entrances. Therefore, a car that was recorded entering or exiting the park at one of the seven survey stations may have entered or exited at an unmanned station and a complete trip would not have been recorded.
- The misreading of a single letter or number on a license plate, such as interpreting a “B” as “8,” “K” as “X,” or “0” as “O,” would prevent a match from occurring.
- A substantial number of vehicles have temporary plates or obstructions, such as dirt, license plate holders, or tinted license plate covers, that block a clear view of some or all of the vehicle registration number.

Despite these factors, approximately 25 percent of all plates recorded entering or exiting the park successfully were matched in trips that could logically be made (i.e., entering time was before exiting time). As a result, the trip pattern analysis was based on 4,759 valid trips. Because of this large number of valid trips, the analyses presented here are believed to provide a very good representation of traffic patterns for vehicles using Rock Creek Park.

Matches were analyzed within three time periods. These included:

- A two-hour period in the morning between 8 and 10 a.m. (28 percent of valid trips);
- A five-hour period during the middle of the day between 10 a.m. and 3 p.m. (46 percent of valid trips); and
- A two-hour period in the afternoon between 3 and 5 p.m. (26 percent of valid trips).

Determination of Current Travel Times

Data on travel times were collected for roadways that have the potential to be diversion routes if the southern part of Beach Drive was closed in the mid-day period. The roadways for which travel time data were collected are shown in Exhibit 2-4.

Actual travel speeds were determined along these nine travel corridors in and near Rock Creek Park on a typical weekday. Runs were made using standard traffic engineering techniques whereby the analyst keeps pace with the prevailing speed of traffic and records travel times and delays. Two runs were made in each direction on the routes shown in Exhibit 2-4 during the morning peak period, during the mid-day, and during the afternoon peak period. Travel times were averaged across the two runs. This information allowed for analysis of the relative attractiveness of various routes for traffic traveling between areas of the trip's origin and destination.

Observed travel speeds by roadway segment within each travel corridor are included in Appendix B. Each travel corridor would consist of multiple Appendix B segments. For example, travel corridor 8 included five segments of Military Drive between Connecticut Avenue on the west and 16th Street on the east, totaling about 11,000 feet or 2.1 miles. This segmentation allowed the calculation of travel times on multiple alternate routes during Beach Drive closures. For example, by adding times associated with segments, one could determine the travel time for a driver traveling from the south end of the park to the Maryland state line via Beach Drive, a Beach-Military-Oregon route, or a Beach-Broad Branch-Brookville-East/West Highway route. While this represents a simplification (because delays associated with making turns are not explicitly taken into consideration), it provides a good tool for use in generalized assessments of how traffic would make use of competing routes.

Trip Pattern Analysis Method

In transportation planning, a table showing the number of trips between various origins and destinations is termed a trip table. For this analysis, eight-zone trip tables were developed. The eight origin or destination zones representing travel-sheds extending from Rock Creek Park are shown in Exhibit 2-5.

- Zones 1 through 5 match the license-match survey stations of the same number.
- Zones 6 and 7 represent trips entering and leaving the park on the numerous small roads between Military Road and the Maryland border. Zone 6 is on the west side of the park and zone 7 is on the east side.
- Zone 8 represents trips entering and leaving the District of Columbia via Beach Drive.

Only one survey station, *station 7* on Beach Drive at the Maryland state line, was located north of Military Road (see Exhibit 2-1). Therefore, it was assumed that the number of trips to and from *zones 6 and 7*, which are north of Military Road and south of the state line, would each be half of the difference between the number of trips that pass through *station 6* on Beach Drive north of Military Road and the number of trips that pass through *station 7* on Beach Drive at the Maryland state line.

Exhibit 2-4
Travel Time Corridors
Rock Creek Park and Potomac Parkway
Transportation Study

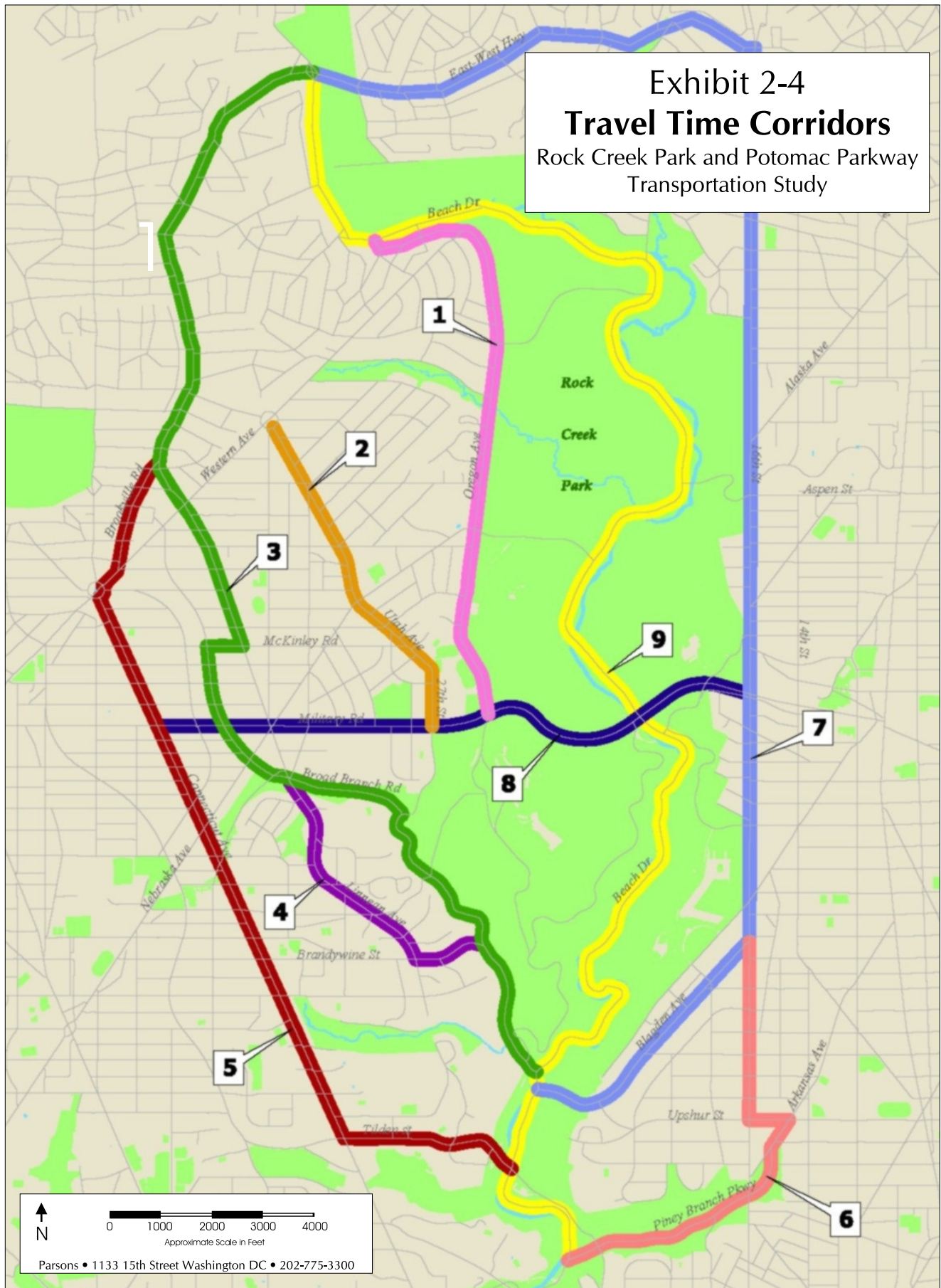
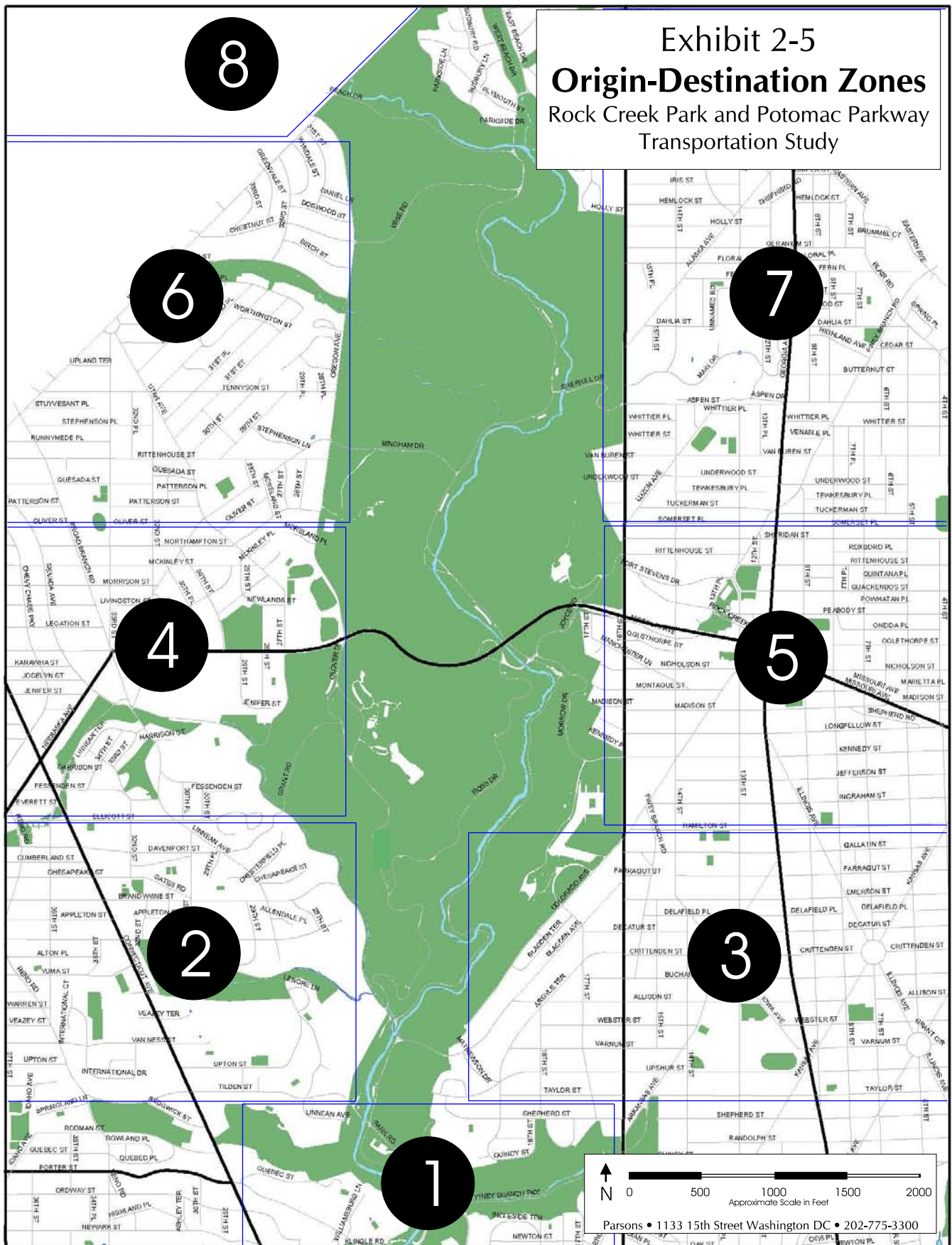


Exhibit 2-5
Origin-Destination Zones
Rock Creek Park and Potomac Parkway
Transportation Study



This level of accuracy for zones 6 and 7 was suitable because traffic on the many small roads in these zones never accounted for more than about 15 percent of the vehicles entering or exiting the park. Moreover, the degree of accuracy needed for this northern part of the study area was lower than for the southern part because the focus of the study was on the potential closure of Beach Drive south of Military Road. However, estimations of travel to and from zones 6 and 7 were necessary to obtain overall estimates of trip diversions that could result from mid-day closure of Beach Drive south of Military Road.

The license plate matching process provided percentage estimates of where vehicles that entered the park at each survey station left the park during the morning, mid-day, and afternoon time periods. These percentage estimates were then applied to the actual traffic counts at each survey station. By doing this, the survey data were “expanded” to encompass all of the vehicles entering or exiting at each station. For example:

- The survey indicated that just under 44 percent of the vehicles entering from Zone 1 during the morning peak leave the park to Zone 2.
- Vehicles counted entering the park from Zone 1 between 8:00 and 10:00 a.m. totaled 787.
- By applying the 44 percent to the 787 vehicles, it was estimated that 346 vehicles travel between Zones 1 and 2 during the two-hour morning analysis period.

The resulting eight-zone trip tables for each of the three time periods are shown in Exhibits 2-6 through 2-8. These trip tables represent the travel patterns determined from the one-day license survey described in Section 2 applied to the *average workday* traffic obtained from the automated traffic counters (see Section 1). Note that the license plate survey covered 10 hours while the analysis covered a 9-hour period (2 hours in each of the morning and afternoon periods and a 5-hour mid-day period). While the total trips for the three time periods do not exactly match the number of vehicles counted during the license plate survey, the trip tables provide an accurate representation of zone-to-zone travel patterns that occur during the three periods on workdays.

EXISTING TRAVEL PATTERNS

Locations where trips enter and exit the Rock Creek Park study area by percent are illustrated in Exhibits 2-9 and 2-10. As shown in the graphs, approximately two-thirds of all traffic going through the Rock Creek Park study area enters and exits through the east (zone 5) and west (zone 4) ends of Military Road. There is a predominantly east to west movement in the morning and the reverse in the afternoon.

Higher traffic volumes exit at the south end of Beach Drive in the morning and higher volumes of traffic enter at this location in the afternoon. Volumes of traffic entering Rock Creek Park north of Military Road (zones 6 and 7) are quite low, even in the morning, but somewhat higher percentages (about 8 or 9 percent) use the small park roads north of Military Road in the afternoon to leave the park. This probably occurs because, based on general observations, the morning rush hour in the vicinity works comparatively well, while traffic on the southern portions of Connecticut Avenue and 16th Street is more congested in the afternoon. As a result, commuters who use Beach Drive in the afternoon probably stay on this roadway until a more northern location within zones 6 or 7 before cutting across on one of the small roads in these zones to Connecticut Avenue or 16th Street.

EXHIBIT 2-6: MORNING TRIP TABLE OF VEHICLE TRIPS DURING THE 2-HOUR PERIOD

		To Zone								Totals
		1	2	3	4	5	6	7	8	
From Zone	1	19	346	77	0	0	144	144	58	788
	2	439	70	20	15	0	0	0	5	549
	3	0	146	390	0	0	0	0	0	536
	4	11	75	22	323	1,538	16	16	0	2,001
	5	67	34	11	2,758	729	0	0	34	3,633
	6	121	7	0	7	0	16	0	0	151
	7	121	7	0	7	0	16	0	0	151
	8	516	0	0	0	54	81	54	0	705
	Totals	1,294	685	520	3,110	2,321	273	214	97	8,514

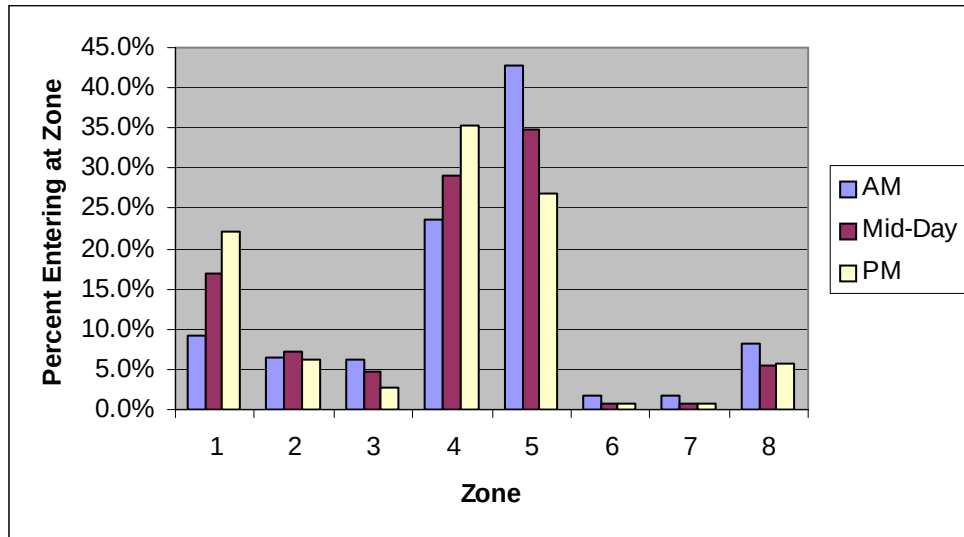
EXHIBIT 2-7: MID-DAY TRIP TABLE OF VEHICLE TRIPS DURING THE 5-HOUR PERIOD

		To Zone								Totals
		1	2	3	4	5	6	7	8	
From Zone	1	407	901	86	12	37	416	416	86	2,361
	2	591	321	23	32	10	13	13	3	1,006
	3	216	286	117	23	6	3	3	0	654
	4	213	125	25	1,196	2,430	16	16	25	4,046
	5	138	61	11	2,596	1,940	41	41	22	4,850
	6	65	4	0	5	0	30	0	0	104
	7	65	4	0	5	0	30	0	0	104
	8	287	22	0	15	52	214	184	0	774
	Totals	1,982	1,724	262	3,884	4,475	763	673	136	13,899

EXHIBIT 2-8: AFTERNOON TRIP TABLE OF VEHICLE TRIPS DURING THE 2-HOUR PERIOD

		To Zone								Totals
		1	2	3	4	5	6	7	8	
From Zone	1	116	367	12	0	6	557	557	129	1,744
	2	370	82	24	0	0	5	5	0	486
	3	93	48	61	6	6	0	0	0	214
	4	39	52	13	442	2,182	26	26	13	2,793
	5	18	18	0	1,619	416	18	18	9	2,116
	6	42	1	0	1	0	6	0	0	50
	7	42	1	0	1	0	6	0	0	50
	8	228	18	0	0	18	105	88	0	457
	Totals	948	587	110	2,069	2,628	723	694	151	7,910

**EXHIBIT 2-9: LOCATIONS WHERE TRIPS
ENTER THE ROCK CREEK PARK STUDY AREA BY PERCENT**



**EXHIBIT 2-10: LOCATIONS WHERE TRIPS
EXIT THE ROCK CREEK PARK STUDY AREA BY PERCENT**

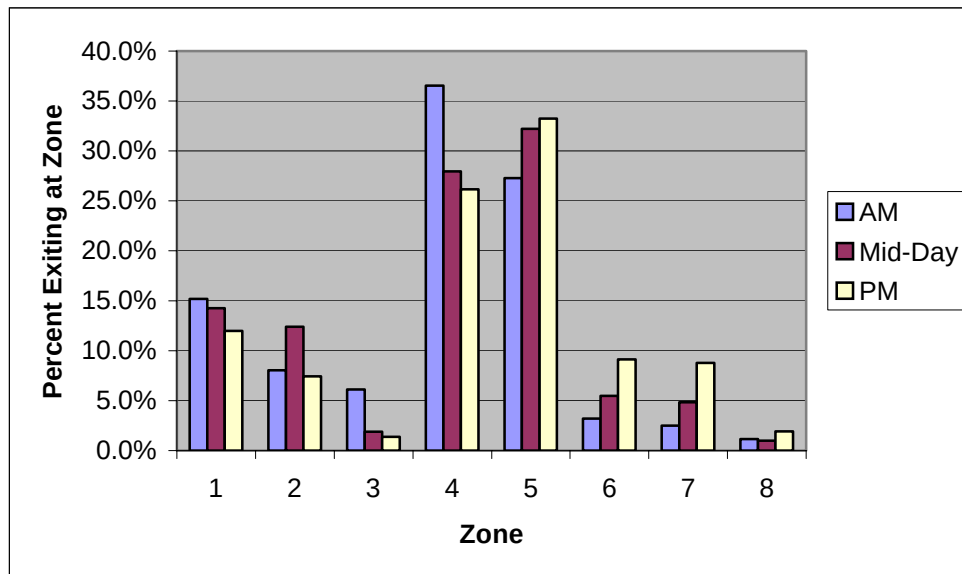


Exhibit 2-11 summarizes, by percentage, the destination zones for trips that enter the park for each of the eight zones. Note that there are trips that go both to and from the same zone. Many of these trips are probably visitors to the park who spend time in the park and then exit by the same route that they entered. The application of these percentages to hourly volumes, providing an hour-by-hour breakdown of where vehicles exit the park, is included in Appendix A.

The data included in Exhibit 2-11 are important in assessing the effects of potential mid-day closure of Beach Drive between Joyce Road and Broad Branch Road. As shown in the table, many of the heaviest traffic movements recorded by the license match survey do not traverse this segment of Beach Drive. For example, the heavy movements between zones 1 and 2, zones 3 and 2, and zones 4 and 5 would not be affected by changes in the management of Beach Drive between Broad Branch Road and Joyce Road. Exhibit 2-12 highlights those traffic movements that make little or no use of the section of Beach Drive that is being considered for closure.

As shown in Exhibit 2-12, only 24 out of the possible 64 (8 by 8 zones) trip interchanges would logically make use of the section of Beach Drive between Joyce Road and Broad Branch Road that is proposed for closure. Applying this logic to the trip table for the mid-day hours (Exhibit 2-7) results in a trip table that consists of a pool of trips that would potentially need to be diverted should the proposed closure of this Beach Drive segment occur. These trips represent approximately 1,900 of the 13,900 mid-day trips shown in Exhibit 2-7, or 14 percent.

The 1,900 trips represent the potential pool of diverted trips, not the actual number of trips that would need to divert. Some of the trips shown in Exhibit 2-13 could potentially use Beach Drive but do not. The actual traffic count on Beach Drive north of Broad Branch Road for the 5-hour, mid-day period is 1,656 vehicles. This actual traffic count was the value used to determine traffic effects of the closure of Beach Drive.

TRAFFIC EFFECTS FROM THE CLOSURE OF BEACH DRIVE IF ALL TRAFFIC DIVERTS TO NON-PARK ROADS

Traffic traveling between a particular origin and destination will generally take routes that require the least amount of travel time. Not all traffic will take the shortest-time route, but more traffic will traverse the shorter-time routes while less traffic will make use of longer-time routes. A transportation planning technique termed pivot-point diversion analysis allows for estimates of travel on various “competing” routes based on travel time. This concept is described fully in “A probabilistic multipath traffic assignment model which obviates path enumeration” (Dial 1971).

For this study, multiple paths were identified for travel between each of the 24 origin-destination pairs that would take the section of Beach Drive between Joyce Road and Broad Branch Road that is being considered for mid-day closure. Using travel time data, at least two and as many as five reasonable alternate paths for each pair were identified. These routes are shown in Appendix C. Features for interpreting the Appendix C data include the following.

- The designation in the column “route number” was assigned arbitrarily and does not relate to the travel corridors shown in Exhibit 2-2.
- Highlighted routes make use of the section of Beach Drive between Broad Branch Road and Joyce Road that would be affected by mid-day closures.

EXHIBIT 2-11: SUMMARY OF TRIP DESTINATIONS

Origin Zone	Destination Zone	Percent Trips from Origin Zone Going to Destination Zone		
		AM Period	Mid-Day Period	PM Period
1	1	2.4	17.2	6.7
1	2	43.9	38.1	21.1
1	3	9.8	3.7	0.7
1	4	0.0	0.5	0.0
1	5	0.0	1.6	0.4
1	6	18.3	17.6	31.9
1	7	18.3	17.6	31.9
1	8	7.3	3.7	7.4
2	1	80.0	58.7	76.2
2	2	12.7	31.9	16.8
2	3	3.6	2.3	5.0
2	4	2.7	3.2	0.0
2	5	0.0	1.0	0.0
2	6	0.0	1.3	1.0
2	7	0.0	1.3	1.0
2	8	0.9	0.3	0.0
3	1	0.0	33.0	43.3
3	2	27.3	43.8	22.4
3	3	72.7	17.9	28.4
3	4	0.0	3.6	3.0
3	5	0.0	0.9	3.0
3	6	0.0	0.4	0.0
3	7	0.0	0.4	0.0
3	8	0.0	0.0	0.0
4	1	0.5%	5.3	1.4
4	2	3.8%	3.1	1.9
4	3	1.1%	0.6	0.5
4	4	16.1%	29.6	15.8
4	5	76.9%	60.1	78.1
4	6	0.8%	0.4	0.9
4	7	0.8%	0.4	0.9
4	8	0.0%	0.6	0.5
5	1	1.9%	2.8	0.9
5	2	0.9%	1.3	0.9
5	3	0.3%	0.2	0.0
5	4	75.9%	53.5	76.5
5	5	20.1%	40.0	19.7
5	6	0.0%	0.9	0.9
5	7	0.0%	0.9	0.9
5	8	0.9%	0.5	0.4
6	1	80.4%	61.9	84.1
6	2	4.3%	4.2	2.3
6	3	0.0%	0.0	0.0
6	4	4.3%	5.1	2.3

EXHIBIT 2-11: SUMMARY OF TRIP DESTINATIONS (CONTINUED)

Origin Zone	Destination Zone	Percent Trips from Origin Zone Going to Destination Zone		
		AM Period	Mid-Day Period	PM Period
6	5	0.0	0.0	0.0
6	6	10.9	28.8	11.4
6	7	0.0	0.0	0.0
6	8	0.0	0.0	0.0
7	1	80.4	61.9	84.1
7	2	4.3	4.2	2.3
7	3	0.0	0.0	0.0
7	4	4.3	5.1	2.3
7	5	0.0	0.0	0.0
7	6	10.9	28.8	11.4
7	7	0.0	0.0	0.0
7	8	0.0	0.0	0.0
		100.0	100.0	100.0
8	1	73.1	37.1	50.0
8	2	0.0	2.9	3.8
8	3	0.0	0.0	0.0
8	4	0.0	1.9	0.0
8	5	7.7	6.7	3.8
8	6	11.5	27.6	23.1
8	7	7.7	23.8	19.2
8	8	0.0	0.0	0.0

**EXHIBIT 2-12: TRIP INTERCHANGES WITH LIMITED USE OF BEACH
DRIVE BETWEEN BROAD BRANCH AND JOYCE ROADS**

		To Station							
		1	2	3	4	5	6	7	8
From Station	1	X ^{a/}	X	X					
	2	X	X	X	X		X		
	3	X	X	X		X			
	4		X		X	X	X	X	X
	5			X	X	X	X	X	X
	6		X		X	X	X	X	X
	7				X	X	X	X	X
	8				X	X	X	X	X

a/ The cells in this table shown with an "X" indicate those trip interchanges that logically make no use of the section of Beach Drive between Broad Branch and Joyce Roads for through trips. For example, a trip going from Military Road east of the park to Beach Drive north of the Montgomery County line (zone 5 to zone 8) would not use Beach Drive south of Military Road unless the trip included a recreational aspect, such as stopping for a picnic lunch while making the trip.

EXHIBIT 2-13: MID-DAY TRIPS – POTENTIAL POOL OF DIVERTED TRIPS

		To Station								Totals
		1	2	3	4	5	6	7	8	
From Station	1	X	X	X	12	37	416	416	86	967
	2	X	X	X	X	10	X	13	3	26
	3	X	X	X	23	X	3	3	0	29
	4	213	X	25	X	X	X	X	X	238
	5	138	61	X	X	X	X	X	X	199
	6	65	X	0	X	X	X	X	X	65
	7	65	4	0	X	X	X	X	X	69
	8	287	22	0	X	X	X	X	X	309
	Totals	768	87	25	35	47	419	432	89	1,902

a/ As in Exhibit 2-12, the 40 cells shown with an “X” represent trip interchanges that would not logically make use of Beach Drive between Broad Branch and Joyce Roads. The remaining 24 trips are those that could potentially make use of alternate routes should Beach Drive be closed during the mid-day hours.

- Travel times are shown in HH:MM:SS format where HH is hours, MM is minutes, and SS is seconds.

As shown in Appendix C, routes that involve travel through the gorge section of Beach Drive often are not the most time-effective. For example, in the first origin-destination pair from zone 1 to zone 4, all of the mid-day and afternoon travel routes that do not involve a drive through the park would take less time than driving during the same period on Beach Drive between Broad Branch and Joyce Roads (route 5). For drivers who elected to use route 5, the choice probably is influenced by the experience of driving through the park rather than the time required for the trip. This was addressed in the analysis by using actual traffic counts combined with license plate survey results for these Beach Drive routes rather than calculating their use based on time of travel.

The proportion of travel between each origin-destination pair on each competing routes was calculated using the pivot-point analysis technique. This same technique was then applied for a scenario where Beach Drive between Broad Branch Road and Joyce Road was closed during the mid-day. Under this scenario, all highlighted travel routes shown in Appendix C that make use of Beach Drive between Broad Branch and Joyce Roads would no longer be available, and all traffic that formerly used these routes would be diverted onto city streets. Because the selection of route based on the experience of driving through the gorge area on Beach Drive would be eliminated, allocation of trips by route for the closure scenario was performed in strict conformance with the method outlined by Dial (1971).

The results of the analysis, based on traffic diverting to alternate routes outside the park in proportion to how quickly the trip could be made on each, is shown in Appendix D. This appendix shows the travel time that each alternate route would require, the percent of the traffic currently using Beach Drive that probably would select this route, and the number of additional trips over the five-hour period that each route would incur. Together, the trips shown in the last column of

Appendix D account for all 1,656 vehicle trips that were counted on Beach Drive north of Broad Branch Road during the 5-hour mid-day period from 10:00 a.m. to 3:00 p.m.

As shown in Appendix D, the *route* that would experience the greatest increase in traffic would be from zone 1 to zone 7 and would result in almost 200 additional trips along Piney Branch and 16th Street. However, many *routes* would use the same road *segments*. Therefore, the numbers of additional trips on individual road *segments* that would occur with the mid-day closure of Beach Drive were summed for all applicable routes and are presented in the shaded column in Exhibit 2-14. As this exhibit indicates, if all traffic were routed outside the park, the highest levels of traffic diversion would be to 16th Street and Broad Branch Road. The highest volume diverted is projected to be 736 vehicles over the 5-hour period (an average of one additional vehicle every 24 seconds) onto Broad Branch Road between Beach Drive and Brandywine Street.

The effects on travel time can be determined by comparing the data in Appendices C and D. This analysis is based on the worst-case assumption for city streets that all drivers who formerly used Beach Drive would now take city streets only to complete their trip.

- On 11 of the 24 zone-to-zone trips, travel times would be reduced for all drivers who were diverted onto city-street routes by the closure of Beach Drive between Broad Branch Road and Joyce Road. Reductions in travel time would range from a few seconds to about five minutes. Travel time reductions would occur for trips from zones 1 to 4, 3 to 4, 3 to 6, 3 to 7, 4 to 1, 4 to 3, 5 to 1, 6 to 3, 7 to 1, 7 to 3, and 8 to 2.
- On 5 of the 24 zone-to-zone trips, travel times would increase for all drivers who were diverted onto city-street routes by the closure of Beach Drive between Broad Branch Road and Joyce Road. Increases in travel time would range from a few seconds to about five minutes. Increased travel times would occur for trips from zones 1 to 7, 1 to 8, 2 to 5, 6 to 1, and 8 to 1.
- For travel among the other eight origin-destination zone pairs, the driver could increase or decrease their travel time, depending on the city-street route they selected. In most cases, their travel time would decrease slightly.

TRAFFIC EFFECTS FROM THE CLOSURE OF BEACH DRIVE IF SOME TRAFFIC DIVERTS TO ROSS DRIVE/GLOVER ROAD

The results in the shaded column of Exhibit 2-14 shows the worst-case condition where all traffic that formerly took Beach Drive between Joyce Road and Broad Branch Road was diverted onto city streets. The analysis was then rerun using the more reasonable assumption that some drivers would choose to take an alternate route through the park consisting of Ross Drive and Glover Road. As before, the analysis used driver route selection based on travel times. It did not include any efforts to encourage drivers to use the Ross Drive/Glover Road route by installing signage or emphasizing its esthetics.

As shown in the last column and row of Exhibit 2-14, an estimated 229 drivers would select to use the Ross Drive/Glover Road route, rather than city streets, based on travel times. Compared to the shaded column:

EXHIBIT 2-14: PROJECTED INCREASES IN TRAFFIC VOLUMES ON ROAD SEGMENTS BASED ON THE POTENTIAL MID-DAY CLOSURE OF BEACH DRIVE				
Road Name	From	To	Increase in Mid-Day Volume (over 5-hour period)	
			Without Ross and Glover as Diversion Routes	With Ross and Glover as Diversion Routes
16th Street	Blagden Avenue	Military Road	629	540
16th Street	Military Road	East-West Highway	428	372
Blagden Avenue	Beach Drive	16th Street	308	268
Brandywine Street	Connecticut Avenue	Linnaean Avenue	78	35
Brandywine Street	Linnaean Avenue	Broad Branch Road	315	111
Broad Branch Road	Beach Drive	Brandywine Street	736	414
Broad Branch Road	Brandywine Street	Linnaean Avenue	421	304
Broad Branch Road	Linnaean Avenue	Military Road	732	439
Broad Branch Road	Military Road	Western Avenue	521	335
Broad Branch Road	Western Avenue	Brookville Road	521	335
Brookville Road and East-West Highway	Broad Branch Road	Beach Drive	352	148
Connecticut Avenue	Brandywine Street	Military Road	293	237
Connecticut Avenue and Brookville Road	Military Road	Broad Branch Road	252	180
East-West Highway	Beach Drive	16th Street	7	9
Linnaean Avenue	Brandywine Street	Broad Branch Road	312	135
Military Road	27th Street	Oregon Avenue	57	99
Military Road	Broad Branch Road	27th Street	57	99
Military Road	Connecticut Avenue	Broad Branch Road	211	157
Military Road	Oregon Avenue	Ross Drive	57	99
Military Road	Ross Drive	16th Street	55	57
Piney Branch Parkway, Arkansas Avenue, Upshur Street, and 16th Street	Beach Drive	Blagden Avenue	322	272
Tilden Street and Connecticut Avenue	Beach Drive	Brandywine Street	260	248
Ross Road and Glover Road	Broad Branch Road	Military Road	Not applicable	229

- The change in numbers of automobiles diverted to 16th Street and Connecticut Avenue would be reduced by around 15 to 25 percent and would have a minimal effect on these busy streets.
- A few city streets, particularly Military Road, would experience even greater traffic levels. However, the increase of 5 to 8 vehicles per hour would not be discernable compared to the approximately 2,000 vehicles per hour that already use Military Road during the mid-day period.
- Traffic increases would be much lower on Broad Branch Road and Brandywine Street. For example, Broad Branch Road between Linnaean Avenue and Military Road would experience an average of one additional vehicle every 41 seconds (compared to every 24 seconds for the shaded column). Brandywine Street between Linnaean Avenue and Broad Branch Road would have one additional vehicle every 3 minutes rather than an additional vehicle every minute.

NPS personnel have proposed actions such as signage and changes to the park brochure to encourage mid-day traffic to use the Ross Drive/Glover Road route. These actions would further increase the numbers of drivers who would use this route if the southern segment of Beach Drive were closed and further reduce the effects on city streets close to the park.

CHANGES IN LEVELS OF SERVICE RESULTING FROM THE CLOSURE OF BEACH DRIVE

Traffic engineers evaluate the traffic operations of roads based on the concept of level of service. Levels of service range from A to F, with A representing traffic flow with minimal delays and F representing failure in traffic operations and lengthy delays. On arterial roadways such as 16th Street, detailed level of service analyses include the analysis of the operations of each signalized intersection.

Because intersection traffic counts were not available for all intersections along the corridors, a planning-level approach for calculating level of service was consistently utilized for all of the roadway analyses. The method used was developed by the Florida Department of Transportation and is based on the industry-standard *Highway Capacity Manual 2000* (Transportation Research Board, 2000).

Exhibit 2-15 summarizes the roadway operations on weekdays and weekends for key roadways in and near Rock Creek Park for existing conditions. These roadways were specified for analysis in the Task 4 scope of services for this traffic study. The maximum 1-hour traffic volume during the time period shown and the time period when the 1-hour peak occurs are included in this exhibit.

As shown in Exhibit 2-15:

- Levels of service A, B, and/or A/B (light and moderate traffic, which are not differentiated by the Florida Department of Transportation planning method) occur throughout the day on both weekdays and weekends on the Military Road and Oregon Avenue segments.
- Traffic consistently operates at level of service C (substantial traffic but with stable operations) on 16th Street. Traffic engineers judge level of service C to represent acceptable traffic operations.

EXHIBIT 2-15: ROADWAY OPERATIONS SUMMARY – EXISTING CONDITIONS

Road Name	Location	Weekday						Weekend					
		AM Peak		MD ^{b/} Peak		PM Peak		AM Peak		MD Peak		PM Peak	
		Vol ^{a/}	LOS	Vol	LOS	Vol	LOS	Vol	LOS	Vol	LOS	Vol	LOS
16th Street	Between Blagden Avenue and Military Road	2,717	C	1,708	C	2,739	C	1,173	C	1,687	C	1,693	C
		8-9 a.m.		2-3 p.m.		5-6 p.m.		9-10 a.m.		2-3 p.m.		5-6 p.m.	
Military Road	Between Oregon Avenue and 16 th Street	3,328	B	2,015	A	2,816	A	1,008	A	1,579	A	1,623	A
		8-9 a.m.		2-3 p.m.		5-6 p.m.		9-10 a.m.		2-3 p.m.		3-4 p.m.	
Blagden Avenue	East of Beach Drive	635	C	415	A/B	597	C	319	A/B	468	A/B	515	C
		8-9 a.m.		2-3 p.m.		5-6 p.m.		9-10 a.m.		1-2 p.m.		3-4 p.m.	
Broad Branch Road	North of Glover Road	594	C	441	A/B	693	C	294	A/B	494	C	510	C
		8-9 a.m.		12-1 p.m.		6-7 p.m.		9-10 a.m.		12-1 p.m.		3-4 p.m.	
Beach Drive	South of Blagden Avenue	1,137	C	1,048	C	1,420	E	494	C	764	C	832	C
		8-9 a.m.		2-3 p.m.		6-7 p.m.		9-10 a.m.		2-3 p.m.		3-4 p.m.	
Oregon Avenue	Between Military Road and Northampton Street	450	A/B	249	A/B	404	A/B	218	A/B	351	A/B	330	A/B
		8-9 a.m.		12-1 p.m.		6-7 p.m.		9-10 a.m.		12-1 p.m.		4-5 p.m.	

a/ Vol=one-hour traffic volume during the time period shown.

b/ MD Peak=peak travel hour during the mid-day (between 10 a.m. and 3 p.m.)

- The Blagden Avenue and Broad Branch Road segments vary between level of service A/B and level of service C, depending on time of day and whether it is a weekday or weekend.
- The only road segment that experiences a level of services lower than level C is Beach Drive south of Blagden Avenue. This road segment has a level of service E (very heavy traffic with unstable flow, average travel speeds of about 33 percent of free-flow conditions, and continuous backup on approaches to intersections) during the weekday afternoon peak. It operates at level of service C at all other times.

Exhibit 2-16 summarizes the roadway operations during the weekday mid-day time period (shaded column in Exhibit 2-15) based on the projected traffic diversions from the mid-day closure of Beach Drive between Broad Branch and Joyce Roads if all traffic is diverted onto city streets (shaded column in Exhibit 2-14). A comparison between Exhibits 2-15 and 2-16 shows that during the peak mid-day hour under these worst-case conditions:

- The Beach Drive and 16th Street segments would have traffic increases of between 150 and 200 vehicles but the levels of service would not change from the current level C.

**EXHIBIT 2-16: EXPECTED TRAFFIC AND OPERATIONS CHANGE
RESULTING FROM MID-DAY CLOSURE OF BEACH DRIVE**

Road Name	Location	Weekday Mid-Day Period				
		Projected Change			Resulting Operations	
		Volume (5 Hours)	Volume (1-Hour) ^{a/}	Percent Change	Hourly Volume	LOS
16th Street	Between Blagden Avenue and Military Road	629	157	9.2%	1,865	C
					2-3 p.m.	
Military Road	Between Oregon Avenue and 16th Street	56	14	0.7%	2,029	A
					2-3 p.m.	
Blagden Avenue	East of Beach Drive	308	77	18.6%	492	C
					2-3 p.m.	
Broad Branch Road	North of Glover Road	736	184	41.7%	625	C
					12-1 p.m.	
Beach Drive	South of Blagden Avenue	789	197	18.8%	1,245	C
					2-3 p.m.	
Oregon Avenue	Between Military Road and Northhampton Street	0	0	0.0%	249	A/B
					12-1 p.m.	

a/ The calculated one-hour volume reflects peaking that occurs within the 5-hours. The volume shown represents traffic that occurs in the highest volume period within the 5 hours. Based on generalized assessment of the traffic counts performed for this study, this single highest hour within the study area is 25 percent of the total 5-hour volume.

- There would be virtually no changes in numbers of vehicles on the Military Road or Oregon Avenue segments. Both would remain at levels A or A/B.
- The Broad Branch Road segment would have an additional 184 vehicles and the Blagden Avenue segment would have an additional 77 vehicles. The level of service on both of these segments would decline from A/B to C.

The preferential use of the Ross Drive/Glover Road by many drivers who formerly used Beach Drive would reduce the traffic effects on city streets outside the park compared to the levels cited above. Based on a preliminary assessment of the diversions, it is likely that the levels of service on Blagden Avenue east of Beach Drive and Broad Branch Road north of Glover Road would not decrease from the A/B levels shown in Exhibit 2-15. This particularly would be true if the National Park Service took measures to encourage driver use of the in-park, Ross Drive/Glover Road route.

CONCLUSIONS

This analysis of traffic diversions is based on information collected from license match surveys and comparative analyses of available travel routes. It shows that traffic diverting from Beach Drive if the road were closed during the mid-day period between Broad Branch and Joyce Roads would split and make use of a number of other roads, primarily including 16th Street, Blagden Avenue, and Broad Branch Road.

The Beach Drive segment between Broad Branch and Joyce Roads carries fewer than 1,700 vehicles in both directions during the 5-hour period between 10:00 a.m. and 3:00 p.m. The peak-hour volume within this time period is slightly over 400 vehicles. If all of the peak hour traffic during the potential mid-day closure period were diverted to city streets (no use of the Ross Drive/Glover Road corridor):

- 16th Street would experience an hourly traffic volume increase of 157 vehicles;
- Blagden Avenue would have an hourly increase of 77 vehicles; and
- Broad Branch Road would have an hourly increase of 184 vehicles.

The increased traffic would have minimal impacts on traffic operations (as measured by level of service) on 16th Street. Levels of service on Blagden Avenue and Broad Branch Road under the worst-case condition would be expected to decrease from level of service A/B to level of service C. Traffic engineers judge level of service C to represent acceptable traffic operations.

Allowing (or encouraging) diverted traffic to use the Ross Drive/Glover Road route rather than city streets would substantially reduce the impacts identified above on city streets. Preliminary assessments indicate that with the availability of this route, the levels of service on Blagden Avenue east of Beach Drive and Broad Branch Road north of Glover Road likely would not decrease from the A/B levels.

The mid-day closure of Beach Drive would have little effect on zone-to-zone travel times for areas outside of the park. Most drivers would slightly reduce their travel times by being diverted away from Beach Drive. However, drivers on 5 of the 24 origin-destination zone pairs would have increased times ranging from a few seconds to about 5 minutes.

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Appendix A
Rock Creek Park and Potomac Parkway Transportation Study
Travel Patterns Leaving Rock Creek Park (Selected Stations)

Location	Percentage of Traffic Leaving Rock Creek Park Via This Location By Hour Starting At:											
	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
Broad Branch Road	10.9%	10.0%	10.3%	11.3%	12.1%	12.0%	11.4%	11.1%	5.7%	4.5%	4.7%	5.4%
Blagden Avenue	7.3%	6.8%	5.7%	1.7%	1.9%	1.9%	1.8%	1.7%	1.7%	1.4%	1.3%	1.5%
Military Road West	37.2%	35.9%	32.7%	26.3%	28.5%	28.0%	28.5%	29.1%	30.4%	31.6%	32.2%	31.8%
Military Road East	23.2%	26.2%	25.3%	28.5%	31.9%	32.7%	33.8%	34.7%	37.9%	40.7%	39.7%	35.3%

These estimates of where traffic leaves Rock Creek Park, by percentage, were based on analysis of the license match survey.

Appendix B
Rock Creek Park and Potomac Parkway Transportation Study
Travel Speeds as Determined from June 2004 Travel Time Runs

Description of Roadway Segment	Segment Length (in feet)	Observed Travel Speeds (miles per hour)					
		AM Peak		MD Peak		PM Peak	
		NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB
Beach Drive between Piney Branch Parkway and Tilden Street	2530	22.4	12.0	19.7	23.5	30.5	25.0
Tilden Street and Connecticut Avenue between Beach Drive and Brandywine Street	6687	18.3	28.9	22.4	21.5	28.2	22.0
Beach Drive between Tilden Street and Blagden Avenue	1506	15.3	7.1	13.8	19.7	17.4	17.3
Beach Drive between Blagden Avenue and Broad Branch Road	315	22.6	11.7	14.8	33.0	23.9	22.6
Broad Branch Road between Beach Drive and Brandywine Street	2572	25.1	31.3	26.0	26.4	28.3	28.3
Broad Branch Road between Brandywine Street and Nevada Avenue	5328	27.4	29.2	24.6	25.7	27.2	29.1
Brandywine Street between Linnean Avenue and Broad Branch Road	1286	19.9	20.9	21.4	23.1	19.5	10.4
Linnean Avenue between Brandywine Street and Broad Branch Road	4183	19.1	19.4	18.0	20.7	19.5	21.1
Broad Branch Road between Nevada Avenue and Military Road	1542	11.7	15.0	11.9	15.0	9.5	13.7
Connecticut Avenue between Brandywine Street and Military Road	4536	7.5	29.2	14.6	16.9	24.5	19.5
Connecticut Avenue and Brookville Road between Military Road and Broad Branch Road	5129	18.4	16.6	19.5	17.0	22.4	16.3
Broad Branch Road between Military Road and Western Avenue	4815	20.0	17.3	14.7	15.7	18.9	17.3
Broad Branch Road between Western Avenue and Brookville Road	1061	17.2	20.4	10.3	14.3	14.3	17.0
Military Road between Connecticut Avenue and Broad Branch Road	2014	10.5	14.3	6.8	24.3	15.0	16.3
Military Road between Broad Branch Road and 27th Street	2856	19.0	15.5	21.6	16.1	13.9	26.9
Military Road between 27 Street and Oregon Avenue	1037	25.3	18.9	15.0	14.1	17.5	28.9
Military Road between Oregon Avenue and Ross Road	2822	31.6	40.5	29.4	40.1	38.9	37.7
Military Road between Ross Road and 16th Street	2302	36.3	13.5	34.1	18.8	36.5	9.7
27th Street and Utah Avenue between Military Road and Western Avenue	6523	19.5	18.9	23.0	21.8	21.6	19.3
Brookville Road and East-West Highway between Broad Branch Road and Beach Drive	8363	26.8	20.4	22.2	23.2	22.4	24.9
16th Street Military Road and East-West Highway	11808	10.9	14.3	10.0	9.8	9.1	12.4
East-West Highway between 16th Street and Beach Drive	8486	8.3	13.2	14.3	13.2	9.2	12.8
Oregon Avenue and Pinehurst Parkway between Military Road and Beach Drive	10684	20.0	20.5	21.4	19.7	22.5	17.3
Beach Drive between Joyce Road and Pinehurst Parkway	16486	30.6	28.5	30.3	29.0	25.3	25.7
Beach Drive between Broad Branch Road and Joyce Road	8392	25.2	25.2	31.9	26.1	25.2	24.7
16th Street between Blagden Avenue and Military Road	4043	23.0	29.3	20.5	22.1	20.1	16.8
Blagden Avenue between Beach Drive and 16th Street	5053	13.8	23.8	18.1	23.8	20.3	23.6
Piney Branch Pkwy, Arkansas, Upshur and 16th between Beach Drive and Blagden Avenue	8943	21.9	10.4	20.3	25.7	20.4	20.0

Appendix C
Rock Creek Park and Potomac Parkway Transportation Study
Potential Travel Routes between Zones (Based on June 2004 Travel Time Data)

From/To Zone	Route Number	Route Description (route makes use of the following roadways)	Travel Time on Route *		
			AM	Mid-Day	PM
1 to 4	1	Beach-Tilden-Connecticut	0:12:19	0:08:22	0:05:44
	2	Beach-Broad Branch-Brandywine-Connecticut	0:13:02	0:09:58	0:07:40
	3	Beach-Broad Branch-Brandywine-Linnean-Broad Branch-Military	0:10:38	0:12:13	0:09:41
	4	Beach-Broad Branch-Military	0:09:37	0:11:21	0:08:42
	5	Beach-Military	0:11:43	0:12:39	0:11:14
1 to 5	1	Piney Branch-16th	0:06:39	0:07:15	0:07:15
	2	Beach-Blagden-16th	0:08:33	0:08:07	0:07:02
	3	Beach-Military	0:08:17	0:07:20	0:08:33
1 to 6	1	Beach-Broad Branch-Brandywine-Linnean-Broad Branch	0:11:53	0:13:46	0:11:53
	2	Beach-Tilden-Connecticut-Brookville	0:15:29	0:11:21	0:08:20
	3	Beach-Broad Branch-Military-Connecticut-Brookville	0:12:47	0:14:20	0:11:18
	4	Beach-Broad Branch	0:10:52	0:12:53	0:10:55
	5	Beach-Military-Broad Branch	0:12:58	0:14:12	0:13:26
1 to 7	1	Beach-East/West	0:21:15	0:20:55	0:22:18
	2	Piney Branch-16th	0:18:55	0:20:40	0:22:03
	3	Beach-Blagden-16th	0:20:49	0:21:31	0:21:50
	4	Beach-Military-16th	0:19:20	0:20:07	0:21:23
1 to 8	1	Beach	0:13:58	0:13:37	0:14:46
	2	Beach-Broad Branch-Brookville-East/West	0:14:25	0:17:10	0:15:10
	3	Beach-Broad Branch-Brandywine-Linnean-Broad Branch-Brookville-East/West	0:15:26	0:18:02	0:16:08
	4	Beach-Military-Oregon-Beach	0:14:56	0:14:12	0:13:35
	5	Beach-Military-27th/Utah-Western-Broad Branch-Brookville-East/West	0:18:37	0:19:12	0:18:37
2 to 5	1	Brandywine-Linnean-Broad Branch-Military	0:11:08	0:10:52	0:11:09
	2	Connecticut-Tilden-Beach-Blagden-16th	0:09:54	0:10:11	0:09:33
	3	Connecticut-Tilden-Beach-Piney Branch-16th	0:11:40	0:12:00	0:11:52
	4	Brandywine-Linnean-Broad Branch-Military	0:11:08	0:10:52	0:11:09
	5	Connecticut-Tilden-Beach-Military	0:09:38	0:09:24	0:11:04
2 to 7	1	Connecticut-Military-16th	0:26:11	0:22:55	0:23:27
	2	Connecticut-Brookville-East/West	0:25:13	0:17:32	0:19:27
	3	Brandywine-Broad Branch-Beach-Blagden-16th	0:22:04	0:22:23	0:24:13
	4	Connecticut-Tilden-Beach-Blagden-16th	0:22:10	0:23:36	0:24:21
	5	Connecticut-Tilden-Beach-East/West	0:26:56	0:22:26	0:27:48
2 to 8	1	Connecticut-Brookville-East/West	0:13:36	0:10:47	0:08:57
	2	Brandywine-Linnean-Broad Branch-Brookville-East/West	0:12:41	0:14:59	0:13:59
	3	Connecticut-Military-Beach	0:19:36	0:15:48	0:14:53
	4	Connecticut-Military-Broad Branch-Brookville-East/West	0:15:27	0:13:38	0:11:29
	5	Connecticut-Tilden-Beach	0:15:19	0:15:41	0:17:18
3 to 4	1	16th-Military	0:08:06	0:09:44	0:08:22
	2	Blagden-Beach-Broad Branch-Military	0:09:38	0:11:04	0:09:13
	3	Blagden-Beach-Tilden-Connecticut	0:15:52	0:10:11	0:08:13
	4	Blagden-Beach-Military	0:11:44	0:12:23	0:11:44
3 to 6	1	Blagden-Beach-Broad Branch	0:10:53	0:12:36	0:11:25
	2	16th-Military-Broad Branch	0:09:20	0:11:16	0:10:34
	3	16th-Military-Connecticut-Brookville	0:11:15	0:12:44	0:10:58
	4	Blagden-Beach-Military-Broad Branch	0:12:59	0:13:55	0:13:57
3 to 7	1	16th	0:14:16	0:15:39	0:17:05
	2	Blagden-Beach-Military-16th	0:20:34	0:20:27	0:23:52
3 to 8	1	Blagden-Beach-Broad Branch-Brookville-Eas/West	0:14:26	0:16:53	0:15:41
	2	Blagden-Beach-Broad Branch-Brandywine-Linnean-Broad Branch-Brookville-East/West	0:15:27	0:17:45	0:16:38

Appendix C
Rock Creek Park and Potomac Parkway Transportation Study
Potential Travel Routes between Zones (Based on June 2004 Travel Time Data)

From/To Zone	Route Number	Route Description (route makes use of the following roadways)	Travel Time on Route *		
			AM	Mid-Day	PM
	3	16th-Military-Oregon-Beach	0:11:18	0:11:17	0:10:43
	4	16th-Military-Beach	0:10:20	0:10:41	0:11:54
	5	Blagden-Beach	0:13:59	0:13:20	0:15:17
4 to 1	1	Connecticut-Tilden-Beach	0:06:47	0:07:48	0:07:15
	2	Connecticut-Brandywine-Broad Branch-Beach	0:10:13	0:08:42	0:09:05
	3	Military-Broad Branch-Linnea-Brandywine-Broad Branch-Beach	0:11:58	0:08:20	0:09:40
	4	Military-Broad Branch-Beach	0:10:53	0:07:46	0:08:06
	5	Military-Beach	0:14:00	0:10:27	0:10:02
4 to 3	1	Military-16th	0:08:36	0:08:04	0:09:17
	2	Military-Broad Branch-Beach-Blagden	0:10:14	0:08:51	0:08:47
	3	Connecticut-Tilden-Beach-Blagden	0:09:40	0:11:00	0:09:54
	4	Military-Beach-Blagden	0:13:20	0:11:32	0:10:43
5 to 1	1	16th-Piney Branch	0:11:23	0:06:02	0:07:49
	2	16th-Blagden-Beach	0:08:47	0:06:35	0:07:19
	3	Military-Beach	0:09:37	0:06:37	0:06:53
5 to 2	1	Military-Broad Branch-Linnea-Brandywine	0:09:14	0:09:18	0:09:47
	2	16th-Blagden-Beach-Tilden-Connecticut	0:10:33	0:08:45	0:08:51
	3	16th-Piney Branch-Beach-Tilden-Connecticut	0:16:49	0:10:53	0:11:27
	4	Military-Broad Branch-Linnea-Brandywine	0:09:14	0:09:18	0:09:47
	5	Military-Beach-Tilden-Connecticut	0:11:23	0:08:47	0:08:25
6 to 1	1	Broad Branch-Linnea-Brandywine-Broad Branch-Beach	0:14:07	0:11:43	0:12:09
	2	Brookville-Connecticut-Tilden-Beach	0:10:18	0:11:14	0:10:49
	3	Brookville-Connecticut-Military-Broad Branch-Beach	0:14:24	0:11:12	0:11:40
	4	Broad Branch-Beach	0:13:02	0:11:09	0:10:34
	5	Broad Branch-Military-Beach	0:16:09	0:13:50	0:12:30
6 to 3	1	Broad Branch-Beach-Blagden	0:12:23	0:12:14	0:11:15
	2	Broad Branch-Military-16th	0:10:46	0:11:27	0:11:46
	3	Brookville-Connecticut-Military-16th	0:12:07	0:11:30	0:12:52
	4	Broad Branch-Military-Beach-Blagden	0:15:30	0:14:55	0:13:11
7 to 1	1	East/West-Beach	0:28:36	0:20:34	0:25:27
	2	16th-Piney Branch	0:20:47	0:19:41	0:18:39
	3	16th-Blagden-Beach	0:18:11	0:20:13	0:18:09
	4	16th-Military-Beach	0:20:14	0:20:53	0:19:41
7 to 2	1	16th-Military-Connecticut	0:17:16	0:24:11	0:19:33
	2	East/West-Brookville-Connecticut	0:21:34	0:17:20	0:20:32
	3	16th-Blagden-Beach-Broad Branch-Brandywine	0:17:09	0:21:53	0:19:39
	4	16th-Blagden-Beach-Tilden-Connecticut	0:19:57	0:22:23	0:19:41
	5	East/West-Beach-Tilden-Connecticut	0:26:01	0:23:17	0:24:01
7 to 3	1	16th	0:10:58	0:15:43	0:13:34
	2	16th-Military-Beach-Blagden	0:18:21	0:21:20	0:18:24
8 to 1	1	Beach	0:16:59	0:13:49	0:14:57
	2	East/West-Brookville-Broad Branch-Beach	0:17:42	0:15:15	0:14:23
	3	East/West-Brookville-Broad Branch-Linnea-Brandywine-Broad Branch-Beach	0:18:47	0:15:49	0:15:57
	4	Beach-Oregon-Military-Beach	0:17:06	0:14:19	0:15:32
	5	East/West-Brookville-Broad Branch-Western-27th/Utah-Military-Beach	0:22:13	0:18:33	0:18:32
8 to 2	1	East/West-Brookville-Connecticut	0:09:57	0:10:35	0:10:02
	2	East/West-Brookville-Broad Branch-Linnea-Brandywine	0:13:44	0:13:35	0:12:55
	3	Beach-Military-Connecticut	0:14:58	0:15:36	0:15:17
	4	East/West-Brookville-Broad Branch-Military-Connecticut	0:12:22	0:14:49	0:11:51
	5	Beach-Tilden-Connecticut	0:18:44	0:15:59	0:16:29

Appendix C
 Rock Creek Park and Potomac Parkway Transportation Study
 Potential Travel Routes between Zones (Based on June 2004 Travel Time Data)

From/To Zone	Route Number	Route Description (route makes use of the following roadways)	Travel Time on Route *		
			AM	Mid-Day	PM
8 to 3	1	East/West-Brookville-Broad Branch-Beach-Blagden	0:17:03	0:16:19	0:15:04
	2	East/West-Brookville-Broad Branch-Linnean-Brandywine-Broad Branch-Beach-Blagden	0:18:07	0:16:53	0:16:38
	3	Beach-Oregon-Military-16th	0:11:43	0:11:56	0:14:48
	4	Beach-Military-16th	0:11:35	0:11:26	0:14:13
	5	Beach-Blagden	0:16:19	0:14:53	0:15:38

* -- Travel time is shown in HH:MM:SS format, where HH is hours, MM is minutes, and SS is seconds. Highlighted routes are those that make use of Beach Drive between Broad Branch and Joyce Roads.

Appendix D
Rock Creek Park and Potomac Parkway Transportation Study
Routes Where Trips from Beach Drive Would Divert (Results of Calculations)

Origin and Destination	Route Designation	Route Description	Mid-Day Period (5 Hours)		
			Travel Time	Percent Travel on this Route [1]	Trips from Beach Drive on this Route [2]
1 to 4	1	Beach-Tilden-Connecticut	0:08:22	50.1%	5
	2	Beach-Broad Branch-Brandywine-Connecticut	0:09:58	25.6%	3
	3	Beach-Broad Branch-Brandywine-Linnean-Broad Branch-Military	0:12:13	10.0%	1
	4	Beach-Broad Branch-Military	0:11:21	14.4%	2
1 to 5	1	Piney Branch-16th	0:07:15	60.2%	19
	2	Beach-Blagden-16th	0:08:07	39.8%	13
1 to 6	1	Beach-Broad Branch-Brandywine-Linnean-Broad Branch	0:13:46	19.1%	69
	2	Beach-Tilden-Connecticut-Brookville	0:11:21	40.0%	145
	3	Beach-Broad Branch-Military-Connecticut-Brookville	0:14:20	16.0%	58
	4	Beach-Broad Branch	0:12:53	24.9%	90
1 to 7	2	Piney Branch-16th	0:20:40	53.6%	194
	3	Beach-Blagden-16th	0:21:31	46.4%	168
1 to 8	2	Beach-Broad Branch-Brookville-East/West	0:17:10	54.4%	41
	3	Beach-Broad Branch-Brandywine-Linnean-Broad Branch-Brookville-East/West	0:18:02	45.6%	34
2 to 5	1	Brandywine-Linnean-Broad Branch-Military	0:10:52	25.4%	2
	2	Connecticut-Tilden-Beach-Blagden-16th	0:10:11	32.1%	3
	3	Connecticut-Tilden-Beach-Piney Branch-16th	0:12:00	17.1%	1
	4	Brandywine-Linnean-Broad Branch-Military	0:10:52	25.4%	2
2 to 7	1	Connecticut-Military-16th	0:22:55	16.9%	2
	2	Connecticut-Brookville-East/West	0:17:32	49.5%	6
	3	Brandywine-Broad Branch-Beach-Blagden-16th	0:22:23	18.8%	2
	4	Connecticut-Tilden-Beach-Blagden-16th	0:23:36	14.8%	2
2 to 8	1	Connecticut-Brookville-East/West	0:10:47	54.0%	1
	2	Brandywine-Linnean-Broad Branch-Brookville-East/West	0:14:59	13.8%	0
	3	Connecticut-Military-Beach	0:15:48	10.6%	0
	4	Connecticut-Military-Broad Branch-Brookville-East/West	0:13:38	21.5%	1
3 to 4	1	16th-Military	0:09:44	40.5%	8
	2	Blagden-Beach-Broad Branch-Military	0:11:04	25.1%	5

Appendix D
Rock Creek Park and Potomac Parkway Transportation Study
Routes Where Trips from Beach Drive Would Divert (Results of Calculations)

Origin and Destination	Route Designation	Route Description	Mid-Day Period (5 Hours)		
			Travel Time	Percent Travel on this Route [1]	Trips from Beach Drive on this Route [2]
	3	Blagden-Beach-Tilden-Connecticut	0:10:11	34.4%	7
3 to 6	1	Blagden-Beach-Broad Branch	0:12:36	28.8%	0
	2	16th-Military-Broad Branch	0:11:16	43.5%	1
	3	16th-Military-Connecticut-Brookville	0:12:44	27.7%	1
3 to 7	1	16th	0:15:39	100.0%	3
3 to 8	1	Blagden-Beach-Broad Branch-Brookville-Eas/West	0:16:53	6.4%	0
	2	Blagden-Beach-Broad Branch-Brandywine-Linnean-Broad Branch-Brookville-East/West	0:17:45	4.8%	0
	3	16th-Military-Oregon-Beach	0:11:17	40.2%	0
	4	16th-Military-Beach	0:10:41	48.6%	0
4 to 1	1	Connecticut-Tilden-Beach	0:07:48	28.8%	53
	2	Connecticut-Brandywine-Broad Branch-Beach	0:08:42	19.3%	36
	3	Military-Broad Branch-Linnean-Brandywine-Broad Branch-Beach	0:08:20	22.7%	42
	4	Military-Broad Branch-Beach	0:07:46	29.2%	54
4 to 3	1	Military-16th	0:08:04	50.2%	11
	2	Military-Broad Branch-Beach-Blagden	0:08:51	35.7%	8
	3	Connecticut-Tilden-Beach-Blagden	0:11:00	14.1%	3
5 to 1	1	16th-Piney Branch	0:06:02	57.9%	70
	2	16th-Blagden-Beach	0:06:35	42.1%	51
5 to 2	1	Military-Broad Branch-Linnean-Brandywine	0:09:18	26.5%	14
	2	16th-Blagden-Beach-Tilden-Connecticut	0:08:45	33.0%	18
	3	16th-Piney Branch-Beach-Tilden-Connecticut	0:10:53	14.1%	7
	4	Military-Broad Branch-Linnean-Brandywine	0:09:18	26.5%	14
6 to 1	1	Broad Branch-Linnean-Brandywine-Broad Branch-Beach	0:11:43	22.1%	12
	2	Brookville-Connecticut-Tilden-Beach	0:11:14	25.7%	15
	3	Brookville-Connecticut-Military-Broad Branch-Beach	0:11:12	25.9%	15
	4	Broad Branch-Beach	0:11:09	26.3%	15
6 to 3	1	Broad Branch-Beach-Blagden	0:12:14	28.4%	0
	2	Broad Branch-Military-16th	0:11:27	36.1%	0
	3	Brookville-Connecticut-Military-16th	0:11:30	35.5%	0
7 to 1	2	16th-Piney Branch	0:19:41	52.4%	30

Appendix D
Rock Creek Park and Potomac Parkway Transportation Study
Routes Where Trips from Beach Drive Would Divert (Results of Calculations)

Origin and Destination	Route Designation	Route Description	Mid-Day Period (5 Hours)		
			Travel Time	Percent Travel on this Route [1]	Trips from Beach Drive on this Route [2]
	3	16th-Blagden-Beach	0:20:13	47.6%	27
7 to 2	1	16th-Military-Connecticut	0:24:11	12.5%	0
	2	East/West-Brookville-Connecticut	0:17:20	49.8%	2
	3	16th-Blagden-Beach-Broad Branch-Brandywine	0:21:53	19.8%	1
	4	16th-Blagden-Beach-Tilden-Connecticut	0:22:23	17.9%	1
7 to 3	1	16th	0:15:43	100.0%	0
8 to 1	2	East/West-Brookville-Broad Branch-Beach	0:15:15	53.2%	133
	3	East/West-Brookville-Broad Branch-Linnean-Brandywine-Broad Branch-Beach	0:15:49	46.8%	117
8 to 2	1	East/West-Brookville-Connecticut	0:10:35	55.4%	11
	2	East/West-Brookville-Broad Branch-Linnean-Brandywine	0:13:35	20.5%	4
	3	Beach-Military-Connecticut	0:15:36	10.5%	2
	4	East/West-Brookville-Broad Branch-Military-Connecticut	0:14:49	13.6%	3
8 to 3	1	East/West-Brookville-Broad Branch-Beach-Blagden	0:16:19	9.9%	0
	2	East/West-Brookville-Broad Branch-Linnean-Brandywine-Broad Branch-Beach-Blagden	0:16:53	8.3%	0
	3	Beach-Oregon-Military-16th	0:11:56	37.8%	0
	4	Beach-Military-16th	0:11:26	44.1%	0

Notes:

[1] -- Estimated percent of travel between the origin-destination pair that would use this route. This is calculated based on the relative travel time of this route as compared to alternative routes.

[2] -- The calculated number of trips over the 5-hour mid-day period that would divert from the section of Beach Drive proposed for closure to this particular route.