2.1 Information Contained in Park Traffic Packages

Section 2 of this report contains a compilation of the *Park Traffic Packages* prepared for the individual park units included in current traffic data collection effort. The *Park Traffic Package* format is discussed in detail in the following section to aid readers in understanding the traffic statistics provided for each park unit.

Each park is reported separately with the data associated with that particular park. All traffic packages conform to a uniform reporting format. Generally, the park traffic package contains the following sections:

- Traffic Flow Map
- Traffic Trends Summary
- Traffic Volume Summary
- Traffic Composition Summary
- ATR Data Summary
- ATR Station Location Maps

Details for each of the section of the park traffic package are provided below.

2.1.1 Traffic Flow Map

This page of the report is a graphic depicting the AADT values for different road segments within a park. For each traffic count station, AADT values are specified (1) numerically and (2) graphically by varying the band width along traffic segment. A legend, provided at the bottom of the page, helps to relate band width with AADT values.

To generate this graphic, park boundaries were established using the ESRI map product provided with ArcView. The park road network was added to the map using ArcView shape files provided by the FHWA/NPS Road Inventory Program (RIP). Traffic flow information was added after exporting the ArcView Map image to Corel Draw.

2.1.2 Traffic Trends Summary

This page provides a summary of the Annual Average Daily Traffic (AADT) and Vehicle Miles of Travel (VMT) for each major roadway segment within the park. The AADT and VMT summaries show historical (1988, 1991, 1994) and current values (2003 or 2004). The 2003 or 2004 AADT values are carried over from the *Traffic Volume Summary* sheet. The procedures to compute VMT values are presented in *Data Analysis* section of this report.

2.1.3 Traffic Volume Summary

This page shows tabulated results of the AADT and SADT calculation for all traffic stations included in the current data collection effort. ATR stations are reported at the top of the table and coverage counts are reported at the bottom of the table. In addition, for the coverage count stations, the table contains information about the 24-hour base traffic volume, beginning date of the 48-hour coverage count, and the AADT and SADT factors for the month of coverage count which were obtained from the referenced ATR stations. The AADT and SADT values for the ATR stations are taken directly from the *ATR Data Summary* sheets. The AADT and SADT values for the coverage count data are computed using procedures presented in the *Data Analysis* section of this report.

There are some locations where data were not obtained from coverage counts and therefore other means of obtaining the AADT estimate were used. In each case, the source of the AADT value (if not from a factored coverage count or ATR station) was noted on the *Traffic Volume Summary* sheet.

2.1.4 Traffic Composition Summary

This page shows pie charts displaying the results of the vehicle classification and vehicle occupancy study conducted at each park.   The data on the pie chart show the percentile distributions of the vehicle counts based on the vehicle classification and/or vehicle occupancy. The vehicle classification and occupancy categories, along with the labels used on the pie charts, are presented in tabulated form at the bottom of the *Traffic Composition Summary* sheet. Details on how the percentile distributions of the vehicle counts based on vehicle classification and vehicle occupancy were computed are presented in the *Data Analysis* section of this report.

Vehicle classification data are important for pavement and bridge design, especially the percentages of heavier vehicles. Vehicle occupancy data are important for computation of people throughput on park roads. For example, to estimate the total number of people using buses versus other types of vehicles on an average day the following procedure could be used.

1. For a selected road link, obtain an AADT value.
2. For each vehicle occupancy category, obtain the percentage of vehicles from the *Vehicle Occupancy* pie chart, express percentage as a fraction.
3. For each vehicle occupancy category, multiply the AADT value by the number of occupants in the vehicle and then by the percentage of vehicles in this occupancy category to obtain total number of people in each vehicle occupancy category.
4. Sum together total number of people carried by vehicles other than buses.
5. Sum together total number of people carried by buses.

To determine the average occupancy rate for a given vehicle type, we divided the total number of people carried in the selected vehicle type by the total number of vehicles in the selected category. The total number of people can be found using procedure described in the previous example. The total number of vehicles in a selected category on an average day can be estimated by multiplying the AADT by the percentile value for the selected vehicle type from the vehicle classification chart and dividing the product by 100.

2.1.5 ATR Data Summary

The next several pages show the summary of the ATR data. Monthly traffic statistics are shown in tabular form on the top part of the sheet. The left hand columns show the year and the month of the data used to develop traffic statistics included in the table: MADT, MAWDT, MAWET, and AADT and SADT factors. In addition, AADT, AAWDT, AAWET, SADT statistics are included below the table in the *ATR Data Summary* sheet. Details on how ATR traffic statistics were developed are provided in the *Data Analysis* section of this report.

In some cases, the 2002-2004 ATR data for a 12 month-period were not available for some months due to equipment problems. For these months, data from previous years were used. In these circumstances, the computed traffic statistics based on the data from previous years were not factored to account for traffic growth/decline in the park. For example, if the table shows the source of the MADT to be 2001, this is the actual 2001 MADT and is not factored.

For the parks where no 2002-2004 ATR data were available (EVER, MACA, ZION, and for ATR Stations 45011 in DEWA and 55012 in ROCR), the historical ATR data were used to obtain seasonal and annual adjustment factors to adjust current coverage counts. For these cases, *ATR Data Summary* sheets contain only AADTF and SADTF information.

Distributions of average monthly traffic volumes (MADT, MAWDT, MAWET) and AADT and SADT values are also shown in the graphical form in the lower portion of the *ATR Data Summary* sheet.

2.1.6 Historical Seasonal Traffic Trend Summary

For the parks road links referencing the ATR stations that are no longer in use, the available historical data were analyzed to check whether the seasonal traffic patterns are similar or change from year to year. For this analysis, a ratio of MADT to AADT was computed for each month for the years with historical data and the results were plotted on the *Historical Seasonal Traffic Trend Summary* sheets.

2.1.7 ATR Station Location Maps

The last few pages show schematic location of permanent ATR stations on the park map and diagrams of the ATR station layouts, including ATR loop locations. ATR station IDs are shown next to each road segment covered by an ATR station. These diagrams were created based on the NPS files.