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VIII. APPENDIX B: METHODOLOGY

As part of the effort to determine the economic benefits of bicycling at the northern Outer Banks, surveys were conducted of five different groups:

- Visiting cyclists
- Bicycling local residents (either full-time or part-time)
- General visitors
- Owners/managers of bed and breakfast and campground facilities
- Guests at the bed and breakfast and campground facilities

Copies of the questionnaires used to collect information are attached as Appendix G (page 67).

In addition, bicycle traffic counts were conducted on bicycle facilities at eleven different locations in the area.

Intercepted Visitor and Resident Cyclists

The survey of the first two groups was intended to provide a profile of people who actually do some bicycling at the northern Outer Banks. Information obtained included respondents' home location, where they stayed (or reside) while in the area, whether they consider themselves to be recreational or advanced cyclists, what they thought about the quality of biking in the area, and suggestions for improvements to the bicycling environment.

In order to reach these two groups, "intercept" surveys were conducted at three locations adjacent to bicycling facilities that included two wide paved shoulder locations and one multi-purpose path location. The three locations were:

- In Duck on the northbound side of NC 12 in the center of town, (in front of Scarborough Faire just north of where the multi-purpose path transitions to become a wide shoulder).
- In Duck, on the southbound side of NC 12 in the same vicinity as note above.
- In Nags Head, on the northbound side of Highway 12 (at about mile marker 16 where there is both a wide paved shoulder and a separate multi-purpose path).

These locations were chosen after a preliminary scouting of the area to determine sites that would have a sufficient amount of bicycling activity, would offer a suitable and safe place to intercept and survey bicyclists, and would provide a fair representation of typical bicycle facilities in the area. This was done in coordination with local town officials, members of local bicycling groups, and the owners of the site property where appropriate.

At each location, a table was set up at which questionnaires were distributed to bicyclists passing by who were willing to stop and fill out the questionnaire. In a few cases, questionnaires were given to the cyclist along with a business reply envelope for later return. An "awning" was erected over each table to provide some protection from sun and rain.

Passing bicyclists were encouraged to stop by preceding signs that announced that a bicycling survey was taking place ahead, and by survey staff standing nearby who verbally requested bikers to stop and fill out a questionnaire. Free bottles of cold water were offered to cyclists who stopped. Each location was staffed over a period of three days approximately as follows:

- Day One: 8:30 AM - 12:30 PM; 2:00 - 4:00 PM (abbreviated by a thunderstorm)
- Day Two: 8:00 AM to 12:00 N; 3:00 - 6:00 PM
- Day Three: 8:00 -10:00 AM (abbreviated by a thunderstorm)

In another effort to reach visiting cyclists, questionnaires were provided to two bicycle rental shops for distribution to their customers. One rental shop was in Nags Head, the other in Duck.

All questionnaires were coded by color or otherwise so that respondents could be identified in terms of the location at which they were surveyed, and their direction of travel. In total, 173 questionnaires were filled out - 143 by Intercepted Visitor Cyclists and 30 by local residents, as shown in the table below.

Table 11. Intercept survey: Total number of visitor cyclists or resident cyclists polled at key locations. Note: Polling numbers do not include children under age 18 for Visitors or Residents. Also, international respondents were not included in Visitor intercepts because they were long-term visitors here for work purposes.

| Intercept Surveys | |
|--------------------------------|------------|
| Visitors | |
| Duck Northbound | 75 |
| Duck Southbound | 22 |
| Nags Head | 46 |
| <i>Subtotal Visitors</i> | <i>143</i> |
| Residents | |
| Duck Northbound | 14 |
| Duck Southbound | 5 |
| Nags Head | 11 |
| <i>Subtotal Residents</i> | <i>30</i> |
| Total Intercept Surveys | 173 |

Visitor Center Tourists

The intention of surveying the next group, Visitor Center Respondents, was to determine what percentage of them participate in bicycling while at the northern Outer Banks. This information in combination with the profiles of cyclists obtained above provides a more quantified estimate of the amount and importance of cycling by visitors or tourists. To reach this group, surveys were placed at three visitor centers in the northern Outer Banks--two in Manteo and one in Southern Shores. In two of the centers, the surveys were made available on the counters for visitors to fill out on location and then place in a nearby "ballot box" for subsequent collection. At one of the centers, Festival Park in Manteo, the center management agreed to place surveys and return envelopes in the bags of all visitors who purchased items from the gift shop. A total of 392 questionnaires were received from Visitor Center Respondents.

Bed and Breakfasts Accommodations and Campgrounds

The last two groups, owners/managers and guests of bed and breakfast or campground facilities were selected because it was believed that these facilities tend to cater to guests more likely to be bicyclists than do other types of visitor accommodations. In addition, the number of such facilities involved was small enough to make the task manageable. To reach these groups, the facilities were first called to determine if the owner/manager was willing to participate in the survey. If willing, they were mailed one questionnaire for the owner/manager to complete, and a batch of questionnaires identical to those provided to general tourists for distribution to their guests. Unfortunately the number of responses by guests was very low and these have therefore not been included in the analysis. Six owners/managers responded and a summary of these responses is included as Appendix E (page 61).

Traffic Counts

In order to obtain data on the total usage of the bicycle facilities (as opposed to developing a profile of typical users), pneumatic rubber tube traffic counting devices were used. These devices record usage on an hourly and daily basis.

Counters were put in place on Monday July 28, 2003 and collected data until Tuesday August 5, 2003. Each counter collected a full 24 hours worth of data per day from July 29 – August 4. (Note: the counters did not collect 24 hours worth of data on July 28 and August 5 and data from these days were therefore not used in the calculations.)

Eleven locations were selected for counters. Counters were placed in four localities: Manteo, Nags Head, Duck and Corolla. Manteo, Nags Head and Duck each had a counter on a side-path. All other locations were on the paved shoulders of NC 12 that were built to accommodate bicyclists. Signs were placed on the approach to the counters that said “Bicycle Traffic Count Ahead.” The table below shows the location of each counter.

Table 12. Number of counters and their locations.

| Facility | Corolla | Duck | Manteo | Nags Head |
|--|--|------|--------|-----------|
| Side path (8-10 feet wide) | 0 | 1 | 1 | 1 |
| Northbound shoulder (4 feet wide, paved) | 2 (1 in North Corolla, 1 in South Corolla) | 1 | 0 | 1 |
| Southbound shoulder (4 feet wide, paved) | 2 (1 in North Corolla, 1 in South Corolla) | 1 | 0 | 1 |

The raw traffic count data had to be adjusted in order to translate the data from the number of times the counters were activated to an estimate of the actual number of individuals who were involved. A number of factors had to be considered. For example:

- On a given trip, most individuals were on a round trip and therefore would have been counted twice.
- On long trips, an individual may have activated several counters along the way.
- Some individuals would have activated the counters on multiple days.
- Some vehicles may have driven over the counters that were placed on road shoulders.

- Some serious bicyclists seemed to prefer riding on the road itself rather than the shoulder and therefore avoided the counters.
- Some counters were activated not by bicycles but by roller blades, baby strollers or skate boards.

The total number of counts recorded over the 24-hour seven day period was 20,106 or 2,872 average riders daily. In order to account for the potential over-estimation factors listed above, a number of adjustments were made to improve the estimate of how many bicyclists were actually using the facilities:

- Most trips are round-trip; therefore, the raw traffic count data were divided in half, to 10,053.
- An assumption was made that the counts recorded by non-bicycles was equally offset by the number of bicyclists missed by the counters because they were riding on the road itself.
- The intercept survey data were analyzed to determine the percentage of individuals who rode on multiple days (the average Intercepted Visitor Cyclist rode 5.4 days). The count data were further reduced to reflect this.
- Data from the intercept surveys were analyzed in order to determine average trip length (Intercepted Visitor Cyclists traveled an average of 7.2 miles one-way). This figure was then used to reduce the count data by the number of trips that were likely to have gone over multiple counters. Because most of counter locations were more than 7.2 miles away from each other when in different municipalities, the calculation was simplified so that the average daily count for each municipality was divided by the number of counter locations within its boundary (two counter locations for each municipality except Manteo, which had only one counter location). Therefore, the average daily count was adjusted to 737 individual cyclists.

In order to obtain an average annual number, a monthly weight for each month was determined based on the Gross Occupancy by Class 2000-2003 from the Outer Banks Visitors Bureau. The average monthly Gross Occupancy was determined from the 2000 to 2002 month Gross Occupancy numbers. Since July and August were the most heavily populated months, and the traffic data came from these months, July and August were used as the standard to weigh the averages of the other months. An average was taken of the Gross Occupancy averages for July and August and this number was used as the divisor of all the other months' Gross Occupancy averages. The sum of all the monthly estimates was totaled to provide the annual estimate of 85,360 individual cyclists.

Also using the Gross Occupancy data, an estimate of individual cyclists during the primary tourist season (May 10 – September 15) can be extrapolated. Eighty percent of the estimated cyclists annually use the bicycle facilities during the tourist season.

Weather

Rain and thunderstorms affected survey collection at certain times on two days. Examination of radar data on those days indicated that rain did not have a significant impact on the total volume of bicycles detected. Bicycle traffic counts decreased by about one percent on days where radar showed precipitation at the counter locations.