

AN EVALUATION AND DESIGN OF ALTERNATIVE METHODS TO ESTIMATE
VISITOR USE, GRAND TETON NATIONAL PARK

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Objectives

The overall objective of this research project is to develop operationally feasible and statistically efficient visitor use estimation procedures for Grand Teton National Park (GTNP). More specific objectives are:

1. Identify problems with the current estimation procedures;
2. Design procedures for generating improved visitor use estimates that satisfy the reporting needs of GTNP;
3. Develop an automatic data processing system that will produce the visitor use summaries required by GTNP; and
4. Implement the procedures on a test scale during the summer of 1982 and estimate parameters for the test period.

Methods

Interviews with park personnel at all levels of park administration were carried out to identify needs and potential biases of current visitor use estimation procedures. Observations were made of park personnel under working conditions at the entrance station in order to develop practical and efficient procedures.

Data collected by park personnel during 1982 included values necessary to report visitor use estimates which are comparable to those obtained in prior years. In addition, these data will be compared to data collected for this research project.

Surveys of numbers of vehicles entering and leaving GTNP during specified blocks of time were made according to a sampling plan at each of the entrance stations (details of the sampling plan will be specified in the final report). In addition, interviews with occupants per vehicle, time spent in GTNP, travel route, and purpose of the trip. Numbers of recreational, non-recreational and non-reportable (e.g., park employees) visits to GTNP through the entrance stations were estimated based on observation of vehicles entering during the sample periods and on continuous traffic counts made at the stations.

Additional traffic counters were placed at temporary positions leading to GTNP in an attempt to improve estimation of the volume of traffic technically inside the park but not entering the stations at Buffalo, Moose or Yellowstone. A sampling plan was used to observe traffic at those sites and record the state of origin (from vehicle license plates), as well as, type of vehicle (i.e., trucks, cars, delivery vans, etc.).

Results

Preliminary analyses indicate that prior visitor use estimation procedures contain several sources of bias (both positive and negative). In the preliminary analysis the mean number of occupants per vehicle was estimated at 3.1 people, down from the current multiplier of 3.3 occupants per vehicle. Similarly the mean length of stay for overnight visitors is estimated to be approximately 36 hours (compared to 12 hours currently used) and the mean length of stay for day-users is estimated to be less than 3 hours (compared to 6 hours currently used). These estimates may be adjusted as the analysis proceeds. For instance, stratification by entrance station may be necessary in order to achieve the most efficient estimators.

Several traffic counters (used at temporary locations during the summer of 1982) proved to be unreliable. Observations and vehicle surveys were made at the sites according to a limited sampling plan and estimates of traffic parameters are available subject to the limitations of the sparse data.

Conclusions

Significant biases exist (both positive and negative) in the reporting system for visitor use currently used by GTNP. The net impact of adjustments in the visitor use and traffic parameters is unknown at this time but it is conjectured that the estimates of numbers of recreational visits and visitor-hours will decrease significantly.