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Accepted design procedures for determining number of fixtures are presented in this report. Volume 2 of this report contains detailed information on the surveys and interviews. Reports 442-4 and 442-5F will include specific recommendations.

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INVESTIGATION OF REST AREA REQUIREMENTS

by

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Research Report Number 442-1, Volume 1

Research Project 3-18-86-442
Design of Rest Area Comfort Stations

conducted for the

Texas State Department of Highways
and Public Transportation

in cooperation with the

U.S. Department of Transportation
Federal Highway Administration

by the

Center for Transportation Research
Bureau of Engineering Research
The University of Texas at Austin

November 1987

PREFACE

The study of rest areas was accomplished with the help of many people. Officials in the states of California, Louisiana, Georgia, Oregon, and Washington graciously consented to be interviewed in person and provided extensive data and resource materials. Personnel in other states agreed to be interviewed by telephone. Officials at the Texas Department of Parks and Wildlife were very helpful in discussing their comfort station designs.

Many people in the Texas State Department of Highways and Public Transportation gave freely of their time to assist in the study. Mr. E. W. (Bill) Wilson, who served as technical advisor for the study; Robert Hays; and Gordon Turn, of the Building Design Section of the Maintenance Division, met with the study supervisors numerous times and offered many helpful suggestions and constructive criticism.

Thanks are due to the many graduate students and staff members at The University of Texas at Austin who participated.

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ABSTRACT

Rest areas are an important part of our highway system, particularly on the interstate system. This report presents the findings of an extensive investigation to determine requirements for rest areas, with particular emphasis on comfort stations. Many sources of information were used in the study.

Highway officials in other states were visited and questioned, rest areas were inspected, comfort stations within the states operated by other agencies were visited, and modular restroom manufacturing facilities were visited. Rest area surveys were conducted, district maintenance personnel were consulted, and complaint letters received by the Texas Department of Highways and Public Transportation (SDHPT) were reviewed.

Accepted design procedures for determining number of fixtures are presented in this report. Volume 2 of this report contains detailed information on the surveys and interviews. Reports 442-4 and 442-5F will include specific recommendations.

SUMMARY

An extensive investigation was conducted to determine requirements for rest areas, particularly comfort stations. Many sources of information were used: officials in highway departments in other states, Texas Parks and Wildlife officials, U.S. Army Corps of Engineers facilities, SDHPT district personnel, and rest area surveys.

IMPLEMENTATION STATEMENT

The results of this study will be used to formulate design recommendations for rest area comfort stations in Texas. The improvement in design will result in more attractive buildings, reduced maintenance, and improved safety.

CHAPTER 1. INTRODUCTION

The initial stimulus for highway roadside rest area development came in the form of a provision of the Federal Aid Highway Act of 1938, which stated that "the States, with the aid of Federal funds, may include... such sanitary and other facilities as may be deemed necessary to provide for the suitable accommodation of the public."

While this act is considered to mark the birth of the highway roadside rest area in the United States, rest area growth did not really begin until passage of the Interstate Highway Act of 1956. However, the major impetus for the construction of highway roadside rest areas was the passage of the Highway Beautification Act of 1965, together with the establishment of the Highway Trust Fund.

Today's rest area user has come to expect more than just a place to rest, and the Texas Department of Highways and Public Transportation (SDHPT) initiated this research project to determine the rest area design, operations, and maintenance criteria required to serve the needs of the highway traveler.

This report covers a comprehensive survey of the current state of highway roadside rest area design, together with conclusions and recommendations. The purpose of this report is to describe the research, summarize the findings, and provide recommendations for rest area design.

Some of the more significant topics covered for highway roadside rest areas are indicated below:

1. spacing of rest areas (i.e., distance between rest areas),
2. overall rest area design criteria,
3. site size and selection criteria,
4. facilities provided at rest areas,
5. rest area lighting and security provisions,
6. restroom building design and layout,
7. interior restroom construction details,
8. restroom plumbing fixtures and accessories,
9. rest area maintenance and operation practices,
10. special services provided at rest areas,
11. recreational vehicle dump stations,
12. joint use rest areas, and
13. rest area vandalism.

While considerable research was conducted on mechanical and sewage handling and treatment systems at highway roadside rest areas, no conclusions or recommendations are drawn in this report, as these recommendations will be covered in two separate reports currently under preparation at The University of Texas at Austin.

CHAPTER 2. SCOPE OF RESEARCH OUTLINE

Research work conducted in this project can be classified into six (6) major categories.

2.1 STATE SURVEYS

Meetings were held with the architects, engineers, and other professionals involved in the design, operation, and maintenance of highway roadside rest areas in their headquarters offices in the capitals of six states.

Answers were provided to a detailed list of questions concerning rest area design that was prepared in advance of the meetings. Other topics germane to rest area design, operation, and maintenance were also covered by the principals involved.

In each case, several detailed sets of drawings, plans, and specifications for various rest areas in each state were provided for the research effort. A detailed report covering each of these meetings is included in Volume 2 of this report. These meetings were followed by a tour of several of the rest areas in each of these states. The states surveyed in this manner were California, Georgia, Louisiana, Oregon, Texas, and Washington. In addition, rest areas were inspected in the state of Mississippi.

Comprehensive telephone surveys were conducted with the professionals involved in the design, maintenance, and operation of highway roadside rest areas in twelve states: Arkansas, Colorado, Florida, Illinois, Minnesota, Nebraska, New Mexico, North Carolina, Oklahoma, Ohio, and Pennsylvania. Copies of the reports of these telephone surveys are included in Volume 2 of this report.

Separate meetings were held with the representatives of three SDHPT districts. The meetings were held in Districts 19 (Atlanta), 6 (Odessa), and 15 (San Antonio), where the district personnel responded to an extensive questionnaire. Each of the meetings was followed with a visit to a district rest area and an interview with the rest area attendant, who responded to a set of prepared questions from a second questionnaire. Separate reports of each of these meetings together with the completed questionnaires appear in Volume 2 of this report.

2.2 OTHER AGENCY SURVEYS

2.2.1 Texas Department of Parks and Wildlife

A meeting and several subsequent discussions were held with the professionals involved in the design, operation, and maintenance of all state park facilities in the Texas Parks and Wildlife Department.

Answers were provided for a detailed list of questions prepared in advance of the meeting concerning park facilities, primarily comfort stations and related utilities and services. Other topics related to the research were also covered by the principals involved. Detailed construction plans and specifications for various Texas state park facilities were furnished for the research effort. A detailed report covering the topics discussed at the meeting is included in Volume 2 of this report.

In addition, an inspection tour of thirteen Texas Parks and Wildlife installations was conducted to provide a large sample of that agency's handling of problems similar to those encountered in the design, operation, and maintenance of highway roadside rest areas. Most of the parks were in relatively remote areas and, in fact there are many areas of similarity involved in the construction and maintenance of these and highway rest area facilities.

A report of this inspection tour is included in Volume 2 of this report.

2.2.2 U. S. Army Corps of Engineers

An inspection tour of five United States Army Corps of Engineers public use areas along the shores of Lake Somerville, near Somerville, Texas, was conducted to view their park facilities and comfort stations. The secondary purpose of the trip was to compare the type of site-built comfort station being replaced by the factory manufactured restrooms manufactured by the Restroom Facilities Division of Intex Corporation. The United States Army Corps of Engineers was identified by Intex Corporation as the largest customer for their factory manufactured restrooms. A copy of the report is included in Volume 2 of this report.

2.2.3 Legal Counsel

Meetings were arranged with both the Texas Attorney General's office and the SDHPT legal counsel to discuss all critical items of concern regarding rest area design, construction, operation, and maintenance. A separate report of this meeting complete with recommendations appears in Volume 2 of this report.

2.3 LITERATURE REVIEW

An extensive literature search was conducted to identify all available literature that might be pertinent to the research. A total of sixty-seven books and papers were identified. Unfortunately, most of them were written during the period marking the major thrust in highway roadside rest area construction, namely the mid 1960's to the early 1970's, and as such these do not at all reflect the current state of rest area design. A list of the more pertinent literature considered is in Volume 2 of this report.

2.4 FACTORY MANUFACTURED RESTROOMS

The Restroom Facilities Division of Intex Corporation plant in Ennis, Texas, was visited for the purpose of observing the manufacturing process and the finished products of

this facility. This visit was prompted by the desire to consider alternate comfort station design and construction. This plant designs and manufactures a line of commercial restrooms which are primarily targeted for park installations. Although they are trying to penetrate the market for highway roadside rest areas, management personnel present were unable to confirm any installation of products sold for this purpose.

A separate report of this trip is included in Volume 2 of this report.

2.5 REVIEW, COMPILATION, AND SUMMARY OF COMPLAINT AND COMMENDATION LETTERS

All letters from the travelling public regarding highway roadside rest areas that were received by the SDHPT and dated from January 1984 through July 1985 were reviewed. The complaints were categorized and summarized and specific comments were itemized in a separate report, which is included in Volume 2 of this report.

2.6 REST AREA USER SURVEYS

A rest area interview form was developed after extensive research and discussion and two field surveys of rest area users were conducted. The surveys involved not only interviewing roadside rest area users, but they also included the collection and compilation of data on such items as

a. the percentage of highway traffic diverting to the rest area during each hour of the survey period,
b. the number of vehicles diverting to the rest area during each hour of the survey period,
c. average duration of visit by category of those vehicles diverting to the rest area during each hour of the entire twenty-four hour period of the survey,
d. hourly percentage breakdown by category of those vehicles diverting to the rest area during each hour of the entire twenty-four hour test period,
e. user responses to questions posed on the rest area interview form,
f. additional comments and suggestions from rest area users, and
g. rest area facilities used.

A separate report on one survey together with a blank copy of the rest area interview form is included in Volume 2 of this report.

CHAPTER 3. RESEARCH FINDINGS

The underlying fundamental approach used in the research effort was to determine the guidelines and recommendations of those practicing professionals who have devoted a significant portion of their careers to the design, operation, and maintenance of roadside rest areas.

While pertinent information obtained from other agencies was considered, where applicable, together with the literature review and surveys, the major thrust of the research concentrated on the practices and recommendations from the states. Using this approach, it is possible to learn what not to do, as well as what should be done, in the design, operation, and maintenance of highway roadside rest areas.

This section of the report represents the research consensus on a number of different topics, each of which is separately covered in the paragraphs that follow.

3.1 SPACING CRITERIA

The research sought to determine the highway roadside rest area spacing criteria used by each state when the program was initially established, and currently. In addition, the states were asked if they were satisfied with the current criteria and, if not, what were their recommended criteria.

3.1.1 Original Criteria

Virtually all states used the criteria of 30 miles apart or 30 minutes driving time between rest areas as their spacing goal upon the initiation of the program. (The 30-mile or 30-minute criterion is synonymous with the 60 MPH speed limit that was prevalent in most states at the time.) Only five of the states that were surveyed actually achieved this goal by July, 1986.

3.1.2 Current Criteria

One hour driving time between rest areas or 50 to 60 miles apart is the current spacing criteria for the majority of states.

3.1.3 Recommended Criteria

The majority of states recommend the 50 to 60-mile spacing, even including some of those that are adhering to the initial criteria of 30 miles separation. Some states cited surveys in support of this and virtually all of them felt that the excess construction, operational, and maintenance costs for the lesser spacing were not justifiable in serving the needs of the travelling public.

3.2 OVERALL DESIGN CRITERIA

All of the states surveyed, except four, are using a formula which starts with the average daily traffic (ADT). The design proceeds as follows.

a. Project the ADT 20 years hence (value 1).

b. Multiply value 1 by a seasonal factor (SF) = (value 2).

c. If the highway is a limited access highway, value 3 = value 2, and skip to step d. If the rest area is designed to serve traffic in both directions, value 2 is multiplied by a directional distribution factor (DDF).

value 3 = value 2 x DDF

d. Next, the design hourly traffic volume (DHV) is determined by multiplying value 3 by the ratio of the DHV to value 3 = (DR). This step is necessary to establish the portion of traffic for which to design on an hourly basis - i.e., DR would normally be greater than 1/24 = 0.0417. DR is an important factor in determining DHV. If the ADT is adjusted by a seasonal factor and a directional distribution factor (if applicable) were evenly distributed over twenty-four hours, the DHV would be 1/24 of value 3 (DR = 0.0417). If it were evenly distributed over an eight-hour period, the DHV would be 1/8 of value 3 (DR = 0.125). The latter value of DR is close to the value used by the state of Oregon.

DHV = value 4 = value 3 x DR

e. The design number of vehicles stopping at a rest area per peak hour is determined by multiplying the DHV by the percentage of the DHV vehicles (P) that are expected to stop at the rest area, where P is expressed in decimal format. P may be determined by conducting surveys at nearby rest areas along the same highway or at other rest areas located in similar surroundings with a similar traffic mix and a similar ratio of commuter traffic to distance travelers. Most states have conducted a sufficient number of surveys to establish an operating range for this factor with the specific design value then dependent on location, traffic mix, ratio of commuter traffic, etc. Some states report that in addition to this range which works well for most rest areas, higher percentage factors are used for forest areas in extreme remote areas or along popular recreational routes. In these instances, some states report using a percentage (P) as high as 20 to 25%.

value 5 = DHV x P

f. Value 5 is then used to determine the required parking, comfort, and other facilities.

(1) Parking

(a) The total number of parking spaces required (TPS) is determined by multiplying value 5 by the fraction of an hour that each vehicle is expected to stay in the rest area (HF):

TPS = value 5 x HF

(b) The number of automobile parking spaces required (A) is determined by multiplying value 5 by the ratio of automobiles to all vehicles (AR) expected in the rest area at any one time during the hour:

A = TPS x AR

(c) The required number of parking spaces for trucks, buses, and large recreational vehicles (T) is determined by multiplying TPS by (1 - AR):

T = TPS x (1 - AR)

Most states have very good data on the traffic mix using their various rest areas and consequently are able to determine AR rather precisely.

(2) Restroom facilities

(a) The number of people using the restrooms per hour (U) is determined by multiplying value 5 by the average numberof vehicle occupants (VO) and by the ratio of those occupants (RO) expected to use the facilities:

U = value 5 x VO x RO

Most states appear to have excellent data based onprevious surveys and they treat VO and RO as constants.

(b) The number of people using the men's facilities per hour (M) is determined by multiplying U by the ratio of males to total restroom facility users (RM):

M = U x RM

(c) The number of people using the women's facilities per hour (F) is determined by multiplying U by the ratio of females to total restroom facility users (1 - RM):

F = U x (1 - RM)

Most states appear to have excellent data based onprevious surveys and they treat RM as a constant. The values calculated for M and F become the design hourly users of the men's and women's restroom facilities, respectively. These values are then used to determine the required number of urinals, toilets, lavatories, and hand and/or air dryers required in each facility, dependent upon the governing building (plumbing) code.

(3) Other facilities

(a) The required number of picnic area shelters and tables (PA) is determined by multiplying the number of automobile parking spaces provided (A) by a picnic area use factor (PAF), which is determined through rest area surveys:

PA = A x PAF

(b) The required number of outside waste receptacles (W) is determined by multiplying the number of automobiles parking spaces provided (A) by a waste receptacle used factor (WRF):

W = A x WRF

(c) The required number of rest area drinking fountains (DF) is determined by multiplying the number of automobile parking spaces provided (A) by a drinking fountain factor (DFF):

DF = A x DFF

The value obtained for DF must be compared to the minimum number of drinking fountains required by the governing building (plumbing) code to make certain that it equals or exceeds the minimum number required by the code.

While all the states surveyed use a format similar to this, there are some rather minor variances in the factors used. For example, some states assume that the ratio of males to total restroom facility users is 0.5 while others use a factor of 0.4 for design purposes.

Several states reported very realistic results using the factors developed by the state of Oregon. Since this is the only specific format mentioned with any degree of regularity, the factors used by the state of Oregon are shown in Table 3.1.

TABLE 3.1 OREGON HIGHWAY ROADSIDE REST AREA DESIGN FACTORS

SF	=	1.7	VO	=	3.0
DDF	=	0.6	RO	=	0.75
DR	=	0.135	RM	=	0.5
P	=	0.05 to 0.13	PAF	=	0.3 to 0.5
HF	=	0.5	WRF	=	0.2 to 0.4
AR	=	0.6	DFF	=	0.1

3.3 SITE SIZE AND SELECTION CRITERIA

3.3.1 Site

While the size of rest area sites inspected varied from 3 to in excess of 80 acres, the majority fell into the 20 to 30-acre range. Most states dedicate rather spacious plots of land and devote considerable effort in designing and maintaining the landscape on the site. Large varieties of trees and other plantings are carefully placed. In most instances it is obvious that the states are trying to make their rest areas "show places,"in an effort to create a very favorable impression on the travelling public.

The site selected should facilitate an attractive layout of all buildings, picnic shelters, and other facilities without conveying a feeling of "crowding". In other words, there should be some open areas between structures, which themselves should not be crowded together. The site should not be long and narrow like an airport runway. The ideal site would have equal dimensions on all sides.

3.3.2 Site Selection

In addition to the need to find a spacious site, there are other important considerations involved. Some of these include:

a. Availability of electric power.
b. Annual rainfall data for evaporative lagoons
   (1) soil classification or percolation test for septic systems with leach fields
   (2) annual rainfall data for evaporative lagoons
   (3) proximity to commercial sewage treatment facilities for direct connection
   (4) level and/or proximity of acquifer for on-site sewage treatment facilities.
c. Source and quality of water supply.
d. Proximity to major metropolitan areas - none of the states interviewed would build a rest area near a major metropolitan area because of the vandalism problem.
e. A "buffer" zone between the rest area and any nearby community that is likely to remain a buffer zone for the anticipated life of the rest area (20 to 25 years).
f. Availability of emergency services, such as fire-fighting, rescue, etc., from nearby communities. One state stressed the need for the state to make budgetary provisions for compensating nearby communities for this type of service.

3.4 LIGHTING

Most of the states place more emphasis on the importance of illumination of rest areas than perhaps any other area of engineering emphasis, with the possible exception of restroom ventilation. While some states use three (3) different types of lighting (high pressure sodium for parking and roadway areas, metal halide on building exteriors, and fluorescent in building interiors), two different forms are more predominantly used. The two more typical current types are fluorescent inside buildings and metal halide (typically mercury vapor) at all exterior locations. Several of the states did indicate that it is their plan to replace all parking area and roadway metal halide fixtures with high pressure sodium fixtures.

The main point made by all states is that it is extremely important that all building interiors are well lighted with no dark corners, and that the path from the farthest parking space to the restroom facilities is not just well lighted but very brightly lighted. Lighting is the main security bulwark against attacks on and molestations of the travelling public.

3.5 BUILDING DESIGN AND LAYOUT

Several features were found to be in common use by most states. Some of these are listed below:

a. Mechanical room containing pipe chases, furnace, and vent stacks located between the men's and women's restroom facilities. Several rest areas inspected utilize the location of this room to facilitate back bolting mirrors and/or plumbing fixtures through the wall to make removal more difficult for vandals.
b. Both natural and mechanical ventilation is paramount in the minds of all professionals involved in the design of restroom facilities at highway roadside rest areas. As a result of this emphasis, noxious odors are virtually eliminated. Restroom facilities are typically provided with low ingress-high egress flow-through ventilation with continuously operating mechanical ventilation. Two of the states permit the heating/mechanical ventilation system to operate in the recirculation mode until a microswitch is activated by someone opening the entrance door, when the systems revert to the full exhaust mode (100% make-up air) for a timed interval.

c. All but one state provides entrance doors on their restroom facilities. Most of them are using heavy metal doors, and, in some cases, plastic overlays are being used to eliminate the problem of denting and scratching of the metal doors, with the subsequent unsightly rusting problems.

d. All but two of the states visited provided dual restroom facilities to minimize the inconvenience to the travelling public when either the men's or women's restroom was out of service for cleaning or maintenance. Of those states surveyed by telephone, all but six had dual facilities while three of these accomplished nearly the same goal by employing both male and female attendants at every rest area to allow both facilities to remain partially open during cleaning. Most of the states provided separate structures but one accomplished the same goal by providing two pull-down overhead doors to subdivide each restroom during cleaning or maintenance. One of the states visited said that consideration was given to providing dual facilities but that its rest area spacing is such that it was not felt necessary. This is the only state that actually has an average spacing of 30 miles. This state also has designed some of its interstate highway roadside rest areas so that traffic lanes moving in each direction have access to two restroom facilities upon exiting the interstate and turning into the rest area.

e. Natural lighting is used extensively by most states even in existing construction, but it is planned for an even higher degree of use in all new construction. It takes the form of clerestories and/or skylights.

3.6 PLUMBING FIXTURES AND ACCESSORIES

Numerous recommendations were made concerning plumbing fixtures and accessories. Some of the more consistent ones are listed below.

a. wall hung toilets and urinals with concealed mounting attachment bolts,

b. flush valves mounted behind permanent construction, and

c. electric hand dryers and no paper towel dispensers; several of the states stressed the fire hazard when paper towels are used.

Most of these were consistently observed during the rest area inspection tours. On the other hand, there were significant inconsistencies on the recommendations for other items, such as stainless steel vs. glazed mirrors, water saver toilets, and waste receptacle design.

All state rest areas observed used vitreous china plumbing fixtures; however, two of the twelve states surveyed by telephone indicated that they had some rest areas with stainless steel plumbing fixtures.

3.7 INTERIOR BUILDING SPECIFICATIONS

Since the design of rest areas is a dynamic, ongoing activity, the interior design of the restroom facilities is impacted perhaps more than most aspects of highway roadside rest area design. Not only are there significant variations in interior design among the states, but there are variations in the interior design of rest areas within a state.

Because of these variations, this summary covers only the consensus aspects of current interior design. A more detailed review may be obtained by referring to the appropriate exhibits in Volume 2 of this report.

a. All states use some form of ceramic tile in current construction.

b. Most states use a ceramic tile wall covering for the interior walls and toilet partitions. One state is using structural glazed tile. Stainless steel toilet partitions are generally considered to be the only acceptable alternative.

c. All states except one use full-height toilet partitions and doors in both men's and women's restrooms.

d. While stainless steel toilet partition doors are considered the most vandal resistant, their use was observed in less than half of the rest area installations.

e. Electrical receptacles (110 volt outlets) are normally provided in both the men's and women's restrooms as a convenience to the travelling public.

3.8 REST AREA OPERATION AND MAINTENANCE

As might be expected, the organization and management control of highway roadside rest area operations and maintenance varies widely among the states; however, there were certain areas of similarity and/or agreement.

a. Most states consider providing 24-hour-per-day, 7-day- per-week rest area custodial coverage to be the ideal approach, and the general consensus is that the absolute minimum coverage provided should be 12-hours-per-day, 7-days-per-week; however, 16-hours-per-day, 7-days-per-week is a more desirable coverage. The majority of the states researched did provide a coverage equal to or in excess of this minimum criteria. It was generally felt that rest area attendants must be present on all seven days of the week to maintain a satisfactory

level of cleanliness and to keep all equipment in satisfactory working order. A lower level of coverage is insufficient to attain this and will ultimately result in vandalism when the public is dismayed over either the state of cleanliness or of equipment functioning poorly.

b. Some of the states require their own attendants and/or contractor's attendants to wear an identifying uniform. It is felt that this improves the overall level of custodian dress, and that it not only improves the public's perception of the custodian but that uniformed attendant adds to the general feeling of improved security.

c. Custodial personnel are typically responsible for building and ground cleanliness and maintenance. In a small rest area, they are sometimes responsible for grass cutting, but, in very large rest areas, the highway maintenance crews handle the mowing of the grass.

d. Most states handle rest area custodial duties with state employees. Two states use contractors at a few selected locations. A number of other states indicated they had tried contractors, but with very poor results and subsequently abandoned this approach. It seems that there was continual bickering over "who was supposed to do what." Those states researched via the telephone were in general very positive about the use of contract personnel for rest area maintenance.

e. Routine maintenance is typically handled by the custodian or other maintenance specialists within the highway district. Major repairs, such as rewinding a burned out motor, are always handled by outside firms.

f. Most states steam clean the restroom facilities two or more times per year and one state includes built-in steam cleaning equipment in the construction of all rest areas.

g. All states prohibit overnight parking in rest areas. While all admit that this rule is not rigidly enforced (most of them report having to enforce it on a "handful" of occasions), they do not really have a problem with "squatters."

While state highway roadside rest area operation and maintenance organizations differ substantially, there is general agreement that the overall management and control of rest area performance would be considerably enhanced if the design, construction, operation, and maintenance were the responsibility of one mid-level manager in the state highway department. One state reported that while this centralized level of authority had not been totally achieved, it compensated by forming a headquarter's design review team that periodically inspects rest areas, roadways, drainage, lighting, etc. and files a report when any remedial action is required. This particular state seemed to feel that this was a very effective approach, and they reported that any discrepancies noted are typically acted upon immediately by the district highway engineer.

3.9 SPECIAL SERVICES - VENDING MACHINES, ETC.

Special services provided at state rest areas vary from only pay telephones to a complete array of vending machines for snacks, soft drinks, newspapers, maps, etc.

Some states place rest areas in conjunction with, adjacent to, or near recreational areas and places of historical and/or geological interest. In some cases, these are explained by "displays" at the rest area and sometimes this is in conjunction with a viewing area.

It was explained that, if heavily used recreational areas are nearby, separate parking should be provided or the rest area parking spaces will be monopolized by the recreational users to the detriment of the rest area parking needs of the travelling public. One state passed a bill that charged an annual fee of $10 for the use of state constructed parking lots near recreational areas and good success was reported with the program.

Two states have for some time awarded permission to various charitable organizations to disburse free coffee to the travelling public and they heavily endorse providing this service.

In one way or another, most states provide (as a minimum) some type of traveller information service concerning local areas of interest. One state constructs and maintains rather complete traveller information gazebos at selected rest areas and advertising space is sold to the business community. These are similar to those found at major airports.

3.10 RECREATIONAL VEHICLE DUMP STATIONS

Most states are experiencing major operational problems with recreational vehicle dump stations. Several states have begun separating the recreational vehicle dump station sewage treatment facilities from the restroom sewage treatment facilities.

The primary problem appears to be the heavy usage of formaldehyde in the recreational vehicle sewage holding tank cleaning solution. This "shocks" the sewage treatment system with a heavier concentration than it can handle. This problem primarily manifests itself near the end of a weekend in certain rest areas, when large numbers of travelers stop to dump their tanks.

All states interviewed would like to see recreational vehicle dump stations eliminated at highway roadside rest areas and one state has initiated a program to eliminate all of them in the state within five years.

One state is required by law to provide recreational vehicle dump stations at all highway roadside rest areas in the state, but the legislature passed a bill charging all licensed recreational vehicle owners one dollar per year. According to those responsible for rest area design, construction, operation, and maintenance, this fee has proved adequate to pay for all these services for recreational vehicle dump stations with separate sewage treatment facilities.

Only one state reported any known incidents of deliberate dumping of toxic wastes into rest area recreational vehicle dump stations.

3.11 JOINT USE REST AREAS

Several states are actively pursuing the concept in which a highway rest area is built in conjunction with commercial enterprises, which become responsible for the operation and maintenance of rest area facilities, as well as the financing of all or part of the rest area construction costs.

Some of the states that are not presently considering this concept indicated that it had been discussed among members of the state rest area management teams and that it may well be considered some time in the future.

In general, it seems a plausible means for reducing the state rest area construction, operation, and maintenance costs which are always important but even more so in today's environment of severe state budgetary constraints.

This concept will be the subject of a planned future study at The University of Texas at Austin.

3.12 REST AREA VANDALISM

Upon the initiation of this project, rest area vandalism was thought to be a major problem and more questions were pursued on this subject with the various states than any other subject.

Vandal resistant design and vandalism problems are addressed in many of the previous sections of this report. These recommendations came forward only in response to specific design problems. However, when the more general question, "Do you have a *major* problem with vandalism?", was asked, the respondents said "no," and in all but one state this was verified by the fact that vandal related repairs represented less that 2% of the total annual rest area operations and maintenance budget. In some instances, vandal-related repair cost was less than 1% of the total annual rest area operation and maintenance budget.

Most of the states accept all or part of the blame for vandalism. Numerous times, the statement was made that, " if we did a good job in design, construction, and maintenance of all rest area facilities, we would not have a vandalism problem, except for those rather rare instances in which a habitual vandal enters the premises intent only on destruction." One state even offered a further clarification by stating that, "if we install all the required facilities and if the equipment does what it is supposed to do the way it is supposed to do it, we will not have a vandalism problem."

This summary of state rest area officials' responses to the vandalism issue is essentially the unanimous opinion of all states visited or surveyed by telephone except for one state.

Vandalism takes many forms, some of which are reported in the exhibits in Volume 2 of this report. Taking a positive approach, the design features and actions recommended by the states surveyed to "thwart" vandalism include:

a. providing concrete trash receptacles outside and inside the building,
b. providing concrete picnic tables and benches,
c. attaching drinking fountains to the restroom building,
d. providing all light fixtures on the building exterior and interior with vandal resistant cover,
e. installing heavy duty exterior doors,
f. heating the restroom building,
g. providing dual men's and women's restroom facilities,
h. providing high level of illumination on the building exterior and interior,
i. building a first class facility with ceramic tile on the floors, walls, and partitions,
j. as an alternative to the use of ceramic tile, using high nickel content stainless steel to provide a tough material that is extremely difficult to drill through,
k. using warm air or compressed air hand dryers as opposed to paper towels,
l. back bolting of mirrors, toilets, and urinals, through the wall,
m. eliminating rest areas near metropolitan areas or *immediately adjacent* to communities of significant size,
n. concealing flush valves behind permanent construction,
o. excluding coin operated vending machines from rest area,
p. maintaining a high level of cleanliness at all times, and
q. ensuring that all equipment, including toilets, urinals, lavatories, faucets, and drinking fountains, is always in good working order.

The three items stressed more than any other were the provision of dual facilities, cleanliness, and equipment maintenance. It was generally felt that nothing is more likely to incite a destructive attitude in a non-vandal prone person than to be denied the facilities expected because they were either unavailable or too dirty.

CHAPTER 4. SUMMARY AND CONCLUSIONS

4.1 SUMMARY

Texas was one of the first states to begin a rest area program on the interstate highway system. Many of its comfort stations are old and only partially enclosed. The rest area sites are generally small. Significant vandalism has been experienced in some rest areas.

An extensive investigation has been conducted to determine the requirements for rest areas, with particular emphasis on comfort stations. Six states were visited to (1) discuss rest area design requirements and (2) observe selected rest areas. Comprehensive telephone surveys were conducted with officials in twelve other states. The Texas Department of Parks and Wildlife was visited to discuss the design of its facilities and to inspect its comfort stations. Several U.S. Army Corps of Engineers facilities were toured. A manufacturing facility was visited to inspect their modular comfort station.

A comprehensive literature review was made to obtain pertinent materials. The legal counsel for the SDHPT was consulted to determine areas which concerned possible litigation. Letters of commendation and complaint received by the Department on rest areas were reviewed.

Two rest area surveys were conducted to gather user information. The numbers of vehicles and users were recorded. Interviews with users were conducted to determine their opinions and needs.

4.2 CONCLUSIONS

Excellent information concerning design procedures, building layouts, materials, design details, and maintenance was obtained. Many of these items are discussed in Chapter 3. This information will provide the basis for design recommendations for Texas rest areas which will appear in future reports.