

**Inventory and Assessment of National Park Visitor Transportation
Systems**

Final Report

Submitted to

National Park Service



Submitted by

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1. INTRODUCTION

At least 47 National Park Service (NPS) units have public transportation systems. These systems, also known as Visitor Transportation Systems (VTSs), range in size from a small bus or tour boat to larger sized fleets, and include a variety of modes such as vans, buses, watercraft, trains, tramways, and seaplanes. Thus far, sixty VTSs have been surveyed.

Visitor Transportation Systems are used to help address transportation and resource protection problems that exist in park units. The dilemma that NPS faces is how to accomplish its dual mandate to protect and preserve natural and cultural resources, while at the same time providing for public access and visitor enjoyment.

As visitation numbers increase, park units are experiencing problems trying to accommodate privately owned vehicles. The problems include traffic congestion, resource degradation, and frustrations expressed by visitors trying to find a parking place or view a resource. Thus, VTSs are being expanded and new VTSs are being implemented to provide access to the park units and to minimize the problems associated with privately owned vehicles.

With the increasing use of VTSs, there is the need to develop a comprehensive database on the extent of current VTS operations. This information is necessary in order to provide better information for management of VTSs (budgeting, operational logistics, and maintenance procedures). The database will serve to highlight effective systems, and suggest solutions for system problems; it will also provide benchmarks against which individual systems can be evaluated.

The remainder of the report consists of the following sections:

- Study Objectives
- Scope of Work
- VTS Survey Methodology
- Summary of VTS Survey Results
- Summary of VTS Data Base System and Procedures
- Survey of NON-NPS Systems
- VTS Assessment
- VTS Needs
- Recommendations

2. STUDY OBJECTIVES

The primary purpose of the project is to develop a database to facilitate a more practical, realistic, and factually based evaluation of VTSS. The database will be formulated to assist both in VTS operations and maintenance activities of existing systems, and planning and design of new VTSS.

Although the study focused primarily on NPS systems, data was also collected from a number of relevant private or government systems to provide a more complete picture of system design and operation possibilities.

3. SCOPE OF WORK

The services provided under this work order are:

Survey all NPS units that operate VTSS

Identify all NPS units with VTSS; develop a survey form; site visits to eight units; collect data from park units.

Collect information on non-NPS systems

Collect information on non-NPS systems to provide a more complete picture of system design, operation and maintenance possibilities.

Evaluate the NPS VTS systems

Determine what the park unit needs are or what the objectives of the VTS are, and whether the needs or objectives are being met. If the park has plans for future changes, assess the effects of the planned changes in terms of the needs or objectives.

Develop a VTS database system

Develop a database system that is based on the information compiled. The database should be designed to allow information to be easily updated and easily retrieved.

Develop a prototype VTS data collection system

Develop procedures for updating on a continual basis. Present pros and cons to a uniform data collection system for all units. Include administrative recommendations such as where the central database should be housed, who would maintain it, and who would be responsible for periodic updating.

4. VTS SURVEY METHODOLOGY

4.1 Scope

The scope of the VTS survey calls for an inventory of all VTS services in the National Park System. At the outset of the project, approximately 42 National Park Service units were identified having a VTS. As the study has progressed, the number has grown to 47 park units with 60 VTSs. Out of 60 VTSs, 30 are surface operations, 29 are waterborne operations, and one is a seaplane operation. It is expected that these numbers will increase as more VTSs are identified and/or implemented. Table 1 lists the number of VTSs by type of group operation.

Table 1: VTSs by Type of Group Operation

VTS Group	Number of VTSs	Percent of VTSs
Surface	30	50%
Waterborne	29	48%
Seaplane	1	2%
Total	60	100%

4.2 Methodology

The methodology to inventory VTS operations began with a brainstorming session with NPS staff from the Denver Service Center, the Field Operations Technical Support Center, and the consultant. The brainstorming session identified a comprehensive list of concerns that should be addressed in the survey. These concerns are as follows:

1. How is the VTS service provided?
2. What kind of VTS service is provided?
3. What is the purpose of the VTS service?
4. When does the VTS service operate?
5. How does the VTS service operate?
6. What are the VTS fleet characteristics?
7. What facilities does the VTS service use?
8. Who uses the VTS service?
9. What is the frequency and performance of the VTS service?
10. How much is charged to use the VTS service?
11. What are the revenue and operating cost of the VTS service?
12. What are the VTS liability and safety programs?
13. What are the VTS maintenance procedures?
14. What future plans are there for the VTS service?

Based on the concerns listed above, a questionnaire was developed for surface VTSs and for waterborne VTSs. Separate questionnaires were developed because issues related by surface VTSs vary from those related to waterborne VTSs. In addition, tables formats were prepared for operating personnel data, service frequency data, fleet characteristics, and fixed facility data. An instruction sheet and a glossary were developed and sent along with each questionnaire. Copies of the questionnaires, tables formats, instructions sheet, and glossary are provided in the Appendix.

Eight park units field-tested the questionnaire to verify that all of the VTS concerns had been addressed. The park units were selected on the basis of the type of VTS ownership/management (e.g., government owned/operated, government owned and contractor

operated, concessioner owned and operated, and contractor owned and operated), as well as type of VTS group (surface or waterborne). The questionnaire was refined on the basis of the input that was received from the field visits.

The questionnaire was distributed to all park units with VTSs with instructions to complete the questionnaire and return it to the Denver Service Center. As the completed questionnaires are received from the park units, they are imputed into a specially designed VTS database.

A detailed report was prepared documenting the survey results to date. This report, entitled "Survey Results" is available as a separate document.

5. SUMMARY OF VTS SURVEY RESULTS

In this section, the response to each survey question is summarized in text and table format. For ease of cross checking, the survey results are reported in fourteen subsections, the identical number of sections that comprise the questionnaire.

A total of 63 VTSs were sent a questionnaire. All but three responded. Non responsive park units included Assateque Island National Seashore, Devils Postpile National Monument, and Little Bighorn Battlefield National Monument. Of those that completed a questionnaire, several had a non-response to particular questions. Follow up telephone calls were conducted. For the most part, a non-response was due to lack of available data.

5.1 *How is the VTS Service Provided?*

5.1.1 *Who currently owns and operates the VTS Service?*

The majority (65%) of the VTSs are concessioner owned and operated. This means that the equipment, and in some cases the facilities, are owned by a concessioner and operated under a concessions agreement. Ten VTSs are government owned and operated. In three of the VTSs, the government owns the equipment and a contractor or concessioner operates the equipment. In seven of the VTSs, the equipment and sometimes the facilities are owned by a contractor and are operated under an agreement with a contractor. Only the VTS at the Big South Fork NRRRA is run by a permit. If successful, it will be brought into a concessioner arrangement. Table 2 lists the number and percentage of the various VTS ownership and operation.

Table 2 VTS Ownership/Operation

VTS Ownership/Operation	Number	Percent
Government Owned and Operated	10	16%
Government Owned and Contractor/Concessioner Operated	3	5%
Contractor Owned and Operated	7	12%
Contractor/Concessioner Owned and Operated	39	65%
Run By Permit	1	2%
Total	60	100%

Table 3 lists the VTS service providers by VTS grouping. The government owns and operates more surface VTSs than waterborne VTSs. A larger percentage of waterborne VTSs are concessioner owned and operated (79%) than surface VTSs (50%).

Table 3: VTS Service Providers by VTS Group

VTS Ownership/Operation	Surface	Waterborne	Seaplane
Government Owned and Operated	6	4	0
Government Owned and Contractor/Concessioner Operated	2	1	0
Contractor Owned and Operated	6	1	0
Concessioner Owned and Operated	15	23	1
Run by Permit	1	0	0
Total	30	29	1

5.2 What Kind of VTS Service is Provided?

5.2.1 What type of vehicles/vessels are used to operate the VTS?

There are at least twelve types of vehicles and vessels used to handle the diverse needs and conditions that occur at various park units. Surface VTSs are the most diverse. Surface VTS vehicles include vans, trams, trains, small buses, open bus (trolley), electric trolley, conventional buses, and trucks. Waterborne VTS vessels include tour boats, passenger ferries, and passenger/vehicle ferries. Currently, tour boats and passenger ferries comprise the largest percentage of the type of vehicles/vessels used in VTSs (25% and 18%, respectively). Table 4 lists the types of vehicles and vessels used to operate the VTS services.

Table 4: Types of VTS Vehicles/Vessels

Type of VTS Vehicles/Vessels	Number of VTSs	Percent
Van	7	12%
Tram	6	10%
Train	2	3%
Small bus	3	5%
Open bus (trolley)	2	3%
Electric trolley	1	2%
Conventional bus	8	13%
4 wheel and 6 wheel trucks	1	2%
Tour boat	15	25%
Passenger ferry	11	18%
Passenger and vehicle ferry	3	5%
Seaplane	1	2%
Total	63	100%

5.2.2 Does the VTS always operate along a fixed or consistent route or routes?

Most often, the VTS operates along a fixed or consistent route or routes. By far, the majority (93%) operates on fixed routes. Only seven percent of the VTSs operate otherwise. Table 5 lists the number of VTSs that have fixed route service.

Table 5: VTS Fixed Route Service

VTS Group	Yes	No
Surface	30	0
Waterborne	25	4
Seaplane	1	0
Total - Number	53	4
Total - Percent	93%	7%

5.2.3 *If the VTS does not always follow a fixed route, how is the path it takes determined?*

The VTSs that do not follow a fixed route are known as demand response systems. In demand response systems, the path of the VTS is determined by specific passenger needs. For example, the path of the VTS may be modified to pick up or drop off passengers at a special location. Or, the path of the VTS may be determined in response to visitors wanting to view resources that may not be on a fixed route. In such systems, the driver of a VTS can reroute the path of the VTS depending on current conditions.

5.3 What is the Purpose of the VTS Service?

5.3.1 *Is the VTS the sole means of access to the park unit (other than walking, bicycling or horseback riding)?*

Currently, twenty-three percent of the VTSs provide the sole means of access to the park units. In the future, VTSs may increasingly become the sole means of access to park units to preserve and/or enhance the enjoyment of the park resource(s). Park units such as the Grand Canyon are planning new transportation systems that intercept visitors at intermodal facilities and bring visitors to the park on visitor transportation systems. Table 6 lists the number of VTSs that are the sole access to the park unit.

Table 6: VTS Sole Access

VTS Group	Yes	No
Surface	7	23
Waterborne	6	22
Seaplane	0	1
Total - Number	14	46
Total - Percent	23%	77%

5.3.2 *Rate each of the following attributes as to their degree of relevance to the VTS Service?*

Respondents were asked to rate the following attributes as to their degree of relevance to the VTS services:

Visitor Enhancement. The VTS enhances the visitor's experience by offering interpretive opportunities, simplifying travel within the park or making it easier to see park features.

Resource Protection. The VTS reduces traffic congestion, noise, air pollution and adverse effects on park resources and values.

Cost Effectiveness. The VTS is a cost-effective alternative to the construction of additional roads, parking and support facilities.

Sustainability. The VTS conserves energy and provides more sustainability for the park unit.

The results of the survey indicate that visitor enhancement is the most relevant attribute of the VTS services. Resource protection is second, followed by cost effectiveness. Sustainability received the lowest ratings. The Tables 7 and 8 provide the results of the survey question, both in total number of VTSs and in percent of total VTSs.

Table 7: VTS Purpose by Total Number of VTSs

Purpose	High	Medium	Low	NA	Total
Visitor Enhancement	48	7	2	3	60
Resource Protection	40	6	10	4	60

Cost Effectiveness	31	9	4	16	60
Sustainability	22	20	3	15	60

NA = does not apply.

Table 8: VTS Purpose by Percent of Total VTSS

Purpose	High	Medium	Low	NA	Total
Visitor Enhancement	80%	12%	3%	5%	100%
Resource Protection	67%	10%	17%	6%	100%
Cost Effectiveness	52%	15%	7%	26%	100%
Sustainability	37%	33%	5%	25%	100%

NA = does not apply.

5.3.3 *Which of the above attributes most nearly describes the primary purpose of the VTS (check one)*

In many cases the respondents indicated that the VTSS serve several purposes, as indicated Tables 7 and 8. In order to determine more clearly the reason why park units have implemented VTSS, respondents were asked to specify the primary purpose for the VTS. For two-thirds of the VTSS, the primary purpose of the VTS is visitor enhancement. Resource protection is second at 26%. Cost effectiveness is third at 7%. No VTS listed sustainability as the primary purpose of the VTS. Table 9 lists the primary purpose of the VTSS.

Table 9: VTS Primary Purpose

VTS Purpose	Number	Percent
Visitor Enhancement	40	67%
Resource Protection	16	26%
Cost Effectiveness	4	7%
Sustainability	0	0
Total	60	100%

5.4 When Does the VTS Service Operate?

5.4.1 Does the VTS operate year around or only during the peak season?

The majority (62%) of VTSs operate only during the peak season. However over one-third (38%) operate year around. A higher percentage of waterborne systems operate year around. Table 10 lists the number of VTSs that operate year around or during the peak season.

Table 10: VTS Operation During the Year

VTS Group	Year Around	Peak Season
Surface	8	22
Waterborne	15	14
Seaplane	0	1
Total - Number	23	37
Total - Percent	38%	62%

5.4.2 What is the peak season for the VTS operation?

The majority (80%) of VTSs have their peak season during the summer. Some VTSs (10%) have their peak season during the winter. A few have their peak season during the fall (7%) or spring (3%). Table 11 lists the peak season of the VTSs.

Table 11: VTS Seasonal Operation

VTS Group	Winter	Spring	Summer	Fall
Surface	2	1	25	2
Waterborne	4	1	22	2
Seaplane	0	0	1	0
Total - Number	6	2	48	4
Total - Percent	10%	3%	80%	7%

5.5 How Does the VTS Service Operate?

5.5.1 Does the VTS operate on a fixed schedule?

Most (88%) VTSs operate on a fixed schedule. Surface VTSs have more flexible schedules than waterborne VTSs. Almost all of the waterborne VTSs operate on a fixed schedule. Only 12% of all VTSs do not operate on a fixed schedule. Table 12 lists the number of VTSs with fixed schedule operation.

Table 12: VTSs with Fixed Schedule Operation

VTS Group	Yes	No
Surface	25	5
Waterborne	28	1
Seaplane	0	1
Total - Number	53	7
Total - Percent	88%	12%

5.5.2 *Is the schedule adjusted weekly?*

One-third of VTs (33%) adjust their schedule during the week. Waterborne VTs are more likely to adjust their schedule during the week. For example, only 27% of surface VTs adjust their schedule during the week, whereas 41% of waterborne VTs adjust their schedule during the week. Table 13 lists the number of VTs that make weekly adjustments to their schedule.

Table 13: VTs that Make Weekly Adjustments to Schedule

VTS Group	Yes	No
Surface	8	22
Waterborne	12	17
Seaplane	0	1
Total - Number	20	40
Total - Percent	33%	67%

5.5.3 *Is the schedule adjusted daily?*

One-third of VTs adjust their schedule on a daily basis. A higher percentage (40%) of surface VTs adjust their schedule on a daily basis, whereas only 28% of waterborne VTs adjust their schedule on a daily basis. Table 14 lists the number of VTs that make daily adjustments to their schedule.

Table 14: VTSs that Make Daily Adjustments to Schedule

VTS Group	Yes	No
Surface	12	18
Waterborne	8	21
Seaplane	0	1
Total - Number	20	40
Total - Percent	33%	67%

5.5.4 Is a VTS schedule provided to vehicle or vessel operators?

For 87% of the VTSs, schedules are provided to operators. A few (13%) VTSs do not provide schedules to operators. In cases where schedules are not provided, trips are dispatched by the concessioner based on customer demand, or else the service is so frequent (15 minutes or less) that drivers are expected to keep vehicles moving continuously. Table 15 lists the number of VTSs that provide schedules to its operators (i.e., drivers and pilots).

Table 15: VTSs that Provide Schedules to Operators

VTS Group	Yes	No
Surface	26	4
Waterborne	26	3
Seaplane	0	1
Total - Number	52	8
Total - Percent	87%	13%

5.5.5 Is a schedule provided to visitors?

Schedules are provided to visitors by 83% of the VTSs. A few VTSs (17%) do not provide schedules to visitors. In cases where schedules are not provided, trips are scheduled based on customer demand, or else the service is frequent enough so that visitors are informed of the start and end times of the VTS service and frequency of service (e.g., every 15 minutes). Table 16 lists the number of VTSs that provide schedules to visitors.

Table 16: VTSs that Provide Schedules to Visitors

VTS Group	Yes	No
Surface	24	6
Waterborne	26	3
Seaplane	0	1
Total - Number	50	10
Total - Percent	83%	17%

5.6 What are the VTS Fleet Characteristics?

5.6.1 For the most part, who provides the VTS Vehicles/Vessels?

The majority (77%) of the VTS vehicles or vessels are provided by the contractor or concessioner. Approximately 23% are provided by the government. Table 17 indicates the number of VTSs by fleet provider.

Table 17: VTS Fleet Provider

VTS Fleet Provider	Number	Percent
Government Owned or Leased	14	23%
Contractor/Concessioner Owned or Leased	46	77%
Total	60	100%

5.6.2 *What is the total number of vehicles or vessels in the VTS fleet?*

Table 18 indicates the type of vehicles or vessels used in the VTSS. The table lists the number VTSS that use each type of vehicles or vessels and the total number of equipment. Also listed are the average fleet size, as well as the maximum and minimum fleet size for each type.

Based on the responses in this survey, there are at least 413 vehicles and vessels in the VTS fleets. There are 313 vehicles used in surface VTSS, 98 vessels in the waterborne VTSS, and 2 seaplanes. In surface VTS fleets, buses are used most often. In waterborne VTSS, tour boats are used most often.

The size of individual VTS fleets vary. In surface VTSS, the minimum number of vehicles is one bus, and the maximum number is 76 buses. In waterborne VTS fleets, the minimum is number is one tour boat or one passenger ferry, and the maximum number is nine tour boats.

Table 18: VTS Fleet Type and Size

Type of Vehicle/Vessel	Number of VTS	Total	Ave.	Max.	Min
Vans	7	47	7	33	2
Tram	6	58	10	38	2
Train	2	24	12	16	8
Small bus	3	16	5	11	1
Open bus (trolley)	2	3	2	2	1
Electric trolley	1	3	3	3	3
Conventional bus	8	146	18	76	1
4 wheel and 6 wheel trucks	1	16	16	16	16
Tour boat	15	51	3	9	1
Passenger ferry	11	40	3	8	1
Passenger and vehicle ferry	3	7	3	3	2
Seaplane	1	2	2	2	2
No response	6	-	-	-	-
Total	60	413	-	-	-

5.6.3 Do any of the vehicles/vessels employ alternative fuels?

Only ten percent of the VTSs currently employ alternative fuels. Otherwise, VTSs are commonly powered by gas or diesel-fueled propulsion equipment. Table 19 lists the number of VTSs that use alternatively fueled vehicles.

Table 19: Alternately Fueled VTSs

VTS Group	Yes	No
Surface	6	24
Waterborne	0	29
Seaplane	0	1
Total - Number	6	53
Total - Percent	10%	90%

5.6.4 What alternative fuels are used?

The type of alternative fuels used in VTSs include electric, propane, and compressed natural gas. Table 20 lists the number of VTSs by alternative fuel type.

Table 20: VTS Alternative Fuel Types

Alternative Fuels	Number of VTSs
Electric	2
Propane	3
Compressed Natural Gas	1

5.6.5 Please provide data for each vehicle or vessel associated with the VTS service.

Table 21 lists the condition ratings for 373 vehicles and vessels. Overall, 51% of vehicles and vessels are above average condition and 16% are below average condition. A larger percentage of waterborne VTS vessels are above average condition (79%) than surface VTS vehicles (45%). Conversely, a larger percentage of surface VTS vehicles are below average condition (19%) than waterborne vessels (4%). This is probably due to US Coast Guard regulations and stringent inspection programs that require vessels to be in satisfactory operating condition.

Table 21: Condition Rating of VTS Vehicles and Vessels

VTS Group	1	2	3	4	5	Total
Surface	46	89	108	35	33	301
Waterborne	22	33	12	2	1	70
Seaplane	1	0	1	0	0	2

Total Number	69	122	121	37	24	373
Percent of Total	18%	33%	32%	10%	6%	

Rating: From 1 (excellent) to 5 (very poor).

5.7 What Facilities Does the VTS Use?

5.7.1 Is there an inventory of VTS facilities (such as garages, maintenance facilities, stations, shelters, signs, ticket booths, offices, etc.)?

Only 32% of the VTSs have an inventory of VTS facilities. The majority (68%) does not have an inventory of VTS facilities. Table 22 lists the number of VTSs that maintain facility inventories.

Table 22: VTSs that Maintain Facility Inventories

VTS Group	Yes	No
Surface	10	20
Waterborne	9	20
Seaplane	0	1
Total - Number	19	41
Total - Percent	32%	68%

5.7.2 For the most part, who owns the VTS Facilities?

The percent of VTSs with facilities that are wholly owned by government is 52%. The percent of VTSs that have contractors or concessioner-owned facilities is 30%. Thirteen percent of the VTSs have facilities that the government owns a partial interest in the VTS facilities. A small percentage (3%) of VTS facilities are owned by others and leased to the contractor or concessioner. Only one VTS has no facilities. Table 23 lists the number of VTSs by VTS ownership type.

Table 23: VTS Facility Ownership

VTS Facility Owners	Number	Percent
Owned by Government	31	52%
Government Owns a Partial Interest	8	13%
Owned by Contractor/Concessioner	18	30%
Other (e.g., leased facilities)	2	3%
No Facilities	1	2%
Total	60	100%

5.7.3 Please provide facility data for each major facility associated with the VTS service.

Table 24 lists the condition ratings for 111 VTS facilities. Overall, 60% of the facilities are above average condition and 13% are below average condition. Fifty-nine percent of surface VTS facilities are above average condition and 60% of waterborne VTS facilities are above average condition. Eighteen percent of surface VTS facilities are below average condition and 11% of waterborne VTS facilities are below average condition.

Table 24: Condition Rating of VTS Facilities

VTS Group	1	2	3	4	5	Total
Surface	13	13	10	4	4	44
Waterborne	17	22	19	4	3	65
Seaplane	0	1	1	0	0	2
Total Number	30	36	30	8	7	111
Percent of Total	27%	30%	27%	7%	6%	100%

Rating: From 1 (excellent) to 5 (very poor).

5.8 Who Uses the VTS Service?

5.8.1 Are passenger counts kept regularly?

Passenger are regularly counted by most VTSs (95%). Only 5% do not record passenger counts. Table 25 lists the number of VTSs that maintain regular passenger counts.

Table 25: VTSs that Maintain Regular Passenger Counts

VTS Group	Yes	No
Surface	28	2
Waterborne	29	0
Seaplane	0	1
Total - Number	57	3
Total - Percent	95%	5%

5.8.2 If so, how often are the counts made?

For those VTSs that record passenger counts, over half (52%) record passenger counts on a daily basis. However, more than one-third (35%) record passengers for each trip. One VTS records passengers each month. Table 26 lists the number of VTSs by passenger counting interval.

Table 26: VTS Passenger Counting Interval

VTS Group	Each Trip	Daily	Monthly	NR
Surface	10	15	0	5
Waterborne	11	16	1	1
Seaplane	0	0	0	1
Total - Number	21	31	1	7
Total - Percent	35%	52%	2%	11%

NR = no response from the VTS provider.

5.9 What is the Frequency and Performance of the VTS?

5.9.1 What is the mileage, trips per day, % peak season trips in which vehicles are (1) filled to capacity, (2) beyond capacity and riders are left behind, and (3) operate on time (within 5 minutes of scheduled time)?

The length of route (mileage) and frequency of service was reported for 111 VTS routes. The length of the routes vary from as little as 0.3 miles, to as much as 164 miles. The average length per route is 4.6 miles.

The frequency of service was determined by the number of trips per day during the peak season. The frequency of service varies from a minimum of one trip per day to a maximum of 160 trips per day. The average is approximately 16 trips per day during the peak season.

Respondents were asked several questions regarding the performance VTS service. The questions relate to individual routes within a VTS system and include the percent of peak season's trips in which vehicles or vessels are:

- Filled to capacity,
- Filled beyond capacity and riders are left behind, and
- Vehicles operate on time (within 5 minutes of scheduled time).

Six percent of VTS routes had no trips that were filled to capacity. Twenty-three percent of routes had one percent to 25% of the trips filled to capacity. Eleven percent of routes had 26% to 50% of the trips filled to capacity. Twelve percent of routes had 51% to 75% of the trips filled to capacity. Thirteen percent of routes had 76% to 100% of the trips filled to capacity during peak season. Capacity information was not reported or available for 39% of VTS routes. Table 27 lists the number of VTS routes that were filled to capacity.

Table 27: VTS Routes with Trips Filled to Capacity

VTS Group	None	1%-25%	26%-50%	51%-75%	76%-100%	NR
Surface	3	8	8	9	9	21
Waterborne	4	18	4	4	4	18
Seaplane	0	0	0	0	2	0
Total - Number	7	26	12	13	15	39
Total - Percent	6%	23%	11%	12%	13%	35%

NR = no response from the VTS provider

During the peak season, twenty-two percent of VTS routes had no trips that were filled beyond capacity and riders were left behind. Thirty-six percent of routes had one percent to 25% of trips filled beyond capacity. Small percentages of routes had trips that had 26% to 100% of trips filled beyond capacity. Data was not reported for 35% of VTS routes. Table 28 lists the number of VTS routes that will filled to capacity and left riders behind.

Table 28: VTS Routes with Trips where Riders are Left Behind

VTS Group	None	1%-25%	26%-50%	51%-75%	76%-100%	NR
Surface	10	21	3	0	3	21
Waterborne	15	17	0	1	0	18
Seaplane	0	2	0	0	0	0
Total - Number	25	40	3	1	3	39
Total - Percent	22%	36%	3%	1%	3%	35%

NR = no response from the VTS provider

Respondents did not provide on-time performance date for thirty-six percent of the routes. However, based on data that was collected, at least eighteen percent of routes have an on-time performance below 90 percent of the time during the peak season. This indicates that there may be route scheduling problems on some routes. On time performance appears to be worse for surface VTSS than with waterborne VTSS. Table 29 lists the on-time performance of VTS routes.

Table 29: On-Time Performance of VTS Routes

VTS Group	50%-85%	86%-90%	91%-95%	96%-100%	NR
Surface	7	6	5	17	23
Waterborne	2	3	13	16	17
Seaplane	0	2	0	0	0
Total - Number	9	11	18	33	40
Total - Percent	8%	10%	16%	30%	36%

NR = no response from the VTS provider

5.9.2 Has the VTS service ever failed to operate a scheduled trip due to a shortage of operable rolling stock or vessel?

Twenty-eight percent of VTSS indicate that the service failed to operate due to a shortage of operable equipment. One-third of waterborne VTSS have this problem. Whereas, 23% of surface VTSS have this problem. Table 30 lists the number of VTSS that failed to operate a scheduled trip due to a shortage of operable equipment.

Table 30: VTSS with Service Failure Due to Inoperable Equipment

VTS Group	Yes	No
Surface	7	23
Waterborne	10	19
Seaplane	0	1
Total - Number	17	43
Total - Percent	28%	72%

5.9.3 Has the VTS failed to operate a scheduled trip due to a shortage of or missing operators?

Only seven percent of VTSS indicated failure to operate a scheduled trip due to a shortage of or missing operators. All occurred with surface VTSS. Table 31 lists the number of VTSS that failed to operate a scheduled trip due to a shortage of drivers or pilots or other required staff.

Table 31: VTSS with Service Failure Due to Operator Shortage

VTS Group	Yes	No
Surface	4	26
Waterborne	0	29
Seaplane	0	1
Total - Number	4	54
Total - Percent	7%	93%

5.10 How much is charged to use the VTS Service?

5.10.1 Is a fare charged to use the VTS service?

Eighty percent of VTSS charge a fare to use the VTS service. A higher percentage of waterborne VTSS (90%) charge a fare than surface VTS (70%). Table 32 lists the number of VTSS that charge a fare.

Table 32: VTSS that Charge Fares

VTS Group	Yes	No
Surface	21	9
Waterborne	26	3
Seaplane	1	0
Total - Number	48	12
Total - Percent	80%	20%

5.10.2 Does the fare charged vary according to season, day of week, or time of day?

A small percentage of VTSS (8%) vary the fare according to season, day of week, or time of year. A higher percentage of waterborne VTSS (14%) vary the fare, than surface VTSS (3%). Table 33 lists the number of VTSS that vary the fare by season, day of week, or time of day.

Table 33: VTSS with Fare Variation by Time

VTS Group	Yes	No
Surface	1	29
Waterborne	4	25
Seaplane	0	1
Total - Number	5	55
Total - Percent	8%	82%

5.10.3 Does the fare vary between adults and children?

Fares vary between adult and children on the majority of VTSS (63%). A higher percentage of waterborne VTSS (86%) vary the fare between adults and children. A lower percentage of surface VTSS (43%) vary the fare between adults and children. Table 34 lists the number of VTS that vary fare with age.

Table 34: VTSS with Fare Variation by Age

VTS Group	Yes	No
Surface	13	17
Waterborne	25	4
Seaplane	0	1
Total - Number	38	22

Total - Percent	63%	37%
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5.11 What are the Revenue and Operating Costs for the VTS Service?

5.11.1 Does the NPS financially support the VTS in any way?

The NPS financially supports approximately 27 percent of the VTSs. Over one-third (37%) of surface VTSs are supported by NPS. Only 17 percent of waterborne VTSs are supported by the NPS. Table 35 lists the number of VTSs that receive financial support from the NPS.

Table 35: VTSs that Receive NPS Financial Support

VTS Group	Yes	No	% NPS Supported
Surface	11	18	37%
Waterborne	5	22	17%
Seaplane	0	1	0%
Total - Number	16	44	
Total - Percent	27%	73%	

5.11.2 Does the NPS or Treasury receive payments from the VTS Contractor/Concessioner?

The NPS or Treasury receives payments from approximately 63 percent of the VTSs. These payments are generally based on a percentage of gross receipts and/or fees for the use of government facilities such as buildings, docks, etc.. Approximately half of surface VTSs pay fees, whereas 79% of waterborne VTSs pay fees. Table 36 lists the number of VTSs that make payments to NPS or the Treasury.

Table 36: VTSs that Make Payments

VTS Group	Yes	No
Surface	14	16
Waterborne	23	6
Seaplane	1	0
Total - Number	38	22
Total - Percent	63%	37%

5.11.3 Does the VTS service receive funds from sources other than NPS (grants, donations, etc.)?

Only seven percent of the VTSs receive funds from sources other than NPS. These sources have included donations, grants, and a contribution from a corporation. Table 37 lists the number of VTSs that have other funding sources than NPS.

Table 37: VTSs with Other Funding Sources

VTS Group	Yes	No
Surface	2	28
Waterborne	2	27
Seaplane	0	1
Total - Number	4	56
Total - Percent	7%	93%

5.12 What are the VTS Liability and Safety Programs?

5.12.1 What liability levels of insurance did the VTS operator carry on operations in 1996, and what is the premium cost for each item?

Liability levels of insurance that VTS operators carried on operations varied by VTS group and size of system. Surface VTSs have lower insurance coverages than waterborne systems. Waterborne VTSs have higher insurance coverage to cover the replacement of high cost vessels and the risk of collision disaster on water. Thus, insurance is a major concern with both surface and waterborne

VTS, and particularly with waterborne systems. Table 38 provides an indication of the maximum levels of coverage reported in the VTS survey. The seaplane VTS carries \$3 million for property damage coverage and \$1 million for personal injury coverage.

Table 38: VTS Insurance Level

VTS Group	Mean	Maximum	Minimum
Surface	\$1 million	\$20 million	\$100,000
Waterborne	\$2 million	\$50 million	\$200,000

The VTS annual insurance premium is commensurate with insurance levels. Thus, surface VTSs have lower premiums than waterborne VTSs. Table 39 lists the mean, maximum and minimum VTS insurance total premiums that surface and waterborne VTSs reported in the survey. The table below provides an indication of the total insurance premiums reported in the VTS survey. The seaplane VTS pays an annual insurance premium of \$1,979.

Table 39: VTS Annual Insurance Premium

VTS Group	Mean	Maximum	Minimum
Surface	\$11,851	\$246,931	\$2,600
Waterborne	\$15,000	\$568,850	\$4,250

5.12.2 Who pays for the insurance?

According to the survey response, the operators of the VTS pay for the insurance. For example, if the VTS is government operated, then the government pays for the insurance. If the VTS is operated by a concessioner or contractor, then they pay the VTS insurance premiums.

5.12.3 Are the individual VTS operators required to provide their own insurance?

Almost all VTS services insure VTS operators. Only 8% are required to provide their own insurance. Table 40 lists the number of VTSs that require operators to provide their own insurance.

Table 40: VTSs Requiring Individual Operators to Provide Insurance

VTS Group	Yes	No
Surface	0	30
Waterborne	4	25
Seaplane	1	0
Total - Number	5	55
Total - Percent	8%	92%

5.12.4 Are the individual VTS operators required to hold a special license?

By far, the majority (93%) of VTS operators are required to hold a special license. For surface VTSs, it is generally a commercial driver's license from the state. For waterborne VTSs, it is generally a pilot's license from the US Coast Guard. Table 41 lists the number of VTSs that require operators to hold a special license.

Table 41: VTs Requiring Special Operator Licenses

VTS Group	Yes	No
Surface	28	2
Waterborne	27	2
Seaplane	1	0
Total - Number	56	4
Total - Percent	93%	7%

5.12.5 Is the operating history of new employees screened before hiring?

Seventy-seven percent of the VTs screen the operating history of new employees before screening. Table 42 lists the number of VTs that screen operator history.

Table 42: VTs that Screen Operator History

VTS Group	Yes	No	NR
Surface	22	6	2
Waterborne	23	5	1
Seaplane	1	0	0
Total - Number	46	11	3
Total - Percent	77%	18%	5%

NR = no response from the VTS provider.

5.12.6 Is substance abuse screening required of new employees prior to hiring?

Seventy-eight percent of VTs require substance abuse screening of new employees prior to hiring. Table 43 lists the number of VTs that require screening of new employees for substance abuse prior to hiring.

Table 43: VTs that Screen for Substance Abuse

VTS Group	Yes	No	NR
Surface	21	6	3
Waterborne	25	3	1
Seaplane	1	0	0
Total - Number	47	9	4
Total - Percent	78%	15%	7%

NR = no response from the VTS provider.

5.12.7 Is there a special operator or safety training program for new employees?

Eighty-five percent of VTs require special operator or safety training programs for new employees. Table 44 lists the number of VTs with safety training program.

Table 44: VTSs with Safety Training Programs

VTS Group	Yes	No	NR
Surface	23	5	2
Waterborne	27	2	0
Seaplane	1	0	0
Total - Number	51	7	2
Total - Percent	85%	12%	3%

NR = no response from the VTS provider.

5.12.8 *Is there a program to identify and discipline operators who commit substance abuse offenses after hiring?*

Eighty percent of VTSs have a program to identify and discipline operators who commit substance abuse offenses after hiring. Table 45 lists the number of VTSs with substance abuse program.

Table 45: VTSs with Substance Abuse Programs

VTS Group	Yes	No	NR
Surface	22	5	2
Waterborne	23	2	2
Seaplane	1	0	0
Total - Number	48	7	4
Total - Percent	80%	12%	8%

NR = no response from the VTS provider.

5.12.9 *Have there been any claims for personal injury lodged against the VTS service over the past five fiscal years?*

Eighteen percent of VTSs have had claims for personal injury lodged against the VTS service over the past five years. Table 46 lists the number of VTSs with personal injury claims over the past five years.

Table 46: VTSs with Personal Injury Claims over Past 5 Years

VTS Group	Yes	No	NR
Surface	5	21	4
Waterborne	6	15	8
Seaplane	0	0	1
Total - Number	11	36	13
Total - Percent	18%	60%	22%

NR = no response from the VTS provider.

5.13 What are the VTS Maintenance Procedures?

5.13.1 *Is there a written maintenance program for the VTS vehicles/vessels?*

Seventy percent of VTSs have written maintenance programs for the VTS vehicles or vessels. A larger percentage of waterborne VTSs (76%) have written maintenance programs than surface VTSs (63%). Table 47 lists the number of VTSs with written maintenance programs. Table 47 lists the number of VTSs with written maintenance programs.

Table 47: VTSs with Written Maintenance Programs

VTS Group	Yes	No
Surface	19	11
Waterborne	22	7
Seaplane	1	0
Total - Number	42	18
Total - Percent	70%	30%

5.13.2 *Are there written procedures for management of hazardous wastes?*

Only 55 percent of VTSs have written procedures for management of hazardous wastes. A larger percentage of waterborne VTSs (62%) have written procedures for management of hazardous wastes than surface VTSs (47%). Table 48 lists the number of VTSs with written procedure for hazardous wastes.

Table 48: VTSs with Written Procedures for Hazardous Wastes

VTS Group	Yes	No
Surface	14	16
Waterborne	18	11
Seaplane	1	0
Total - Number	33	27
Total - Percent	55%	45%

5.13.3 *Is there a written training program for VTS vehicle/vessel maintainers?*

Only 35 percent of VTSs have a written training program for VTS vehicle or vessel maintainers. Table 49 lists the number of VTSs with written training programs for maintainers.

Table 49: VTSs with Written Training Programs

VTS Group	Yes	No
Surface	10	20
Waterborne	11	18
Seaplane	0	1
Total - Number	21	39
Total - Percent	35%	65%

5.13.4 *Is there a written safety program for VTS vehicle/vessel maintainers?*

Only 42% of VTSs have a written safety program for VTS vehicle or vessel maintainers. Forty-one of waterborne VTSs have written safety programs, whereas 43% of surface VTSs have written safety programs. Table 50 lists the number of VTSs with written safety programs for vehicle or vessel maintainers.

Table 50: VTSs with Written Safety Programs

VTS Group	Yes	No
Surface	13	17
Waterborne	12	17
Seaplane	0	1
Total - Number	25	35
Total - Percent	42%	58%

5.13.5 *Are the maintainers required to be certified before working on Air Conditioning or Brake Systems?*

Only 25 percent of VTSs require maintainers to be certified before working on air conditioning or brake systems. A larger percentage of surface VTSs (40%) ostensibly require certification than waterborne VTSs (10%). Table 51 lists then number of VTSs that require maintainers to be certified before working on air conditioning or brake systems.

Table 51: VTSs that Require Maintenance Certification

VTS Group	Yes	No
Surface	12	18
Waterborne	3	26
Seaplane	0	1
Total - Number	15	45
Total - Percent	25%	75%

5.13.6 Are records required by OSHA and other Federal Agencies concerning hazards in the work place regularly maintained or, in the case of contractor/concessioner, inspected by NPS personnel?

Approximately half (53%) of VTSs maintain records required by OSHA or other Federal Agencies concerning hazards in the work place. Table 52 lists the number of VTS that require records to be maintained on work place hazards.

Table 52: VTSs that Maintain Records on Work Place Hazards

VTS Group	Yes	No
Surface	16	14
Waterborne	16	13
Seaplane	1	0
Total - Number	33	27
Total - Percent	55%	45%

5.13.7 What is the number of vehicles held out of service on a typical day during the peak visitor season for maintenance (routine or otherwise)? {Reported below are the number of VTSs that reported shopped vehicles.}

Twenty-five percent of VTSs report vehicles held out of service on a typical day during the peak visitor season for maintenance. One-third of surface VTSs have shopped vehicles during the peak visitor season, whereas 17% of waterborne VTSs have shopped vessels during the peak visitor season. Table 53 lists the number of VTSs that have shopped vehicles during peak visitor season.

Table 53: VTSs with Shopped Vehicles During Operations

VTS Group	Yes	No
Surface	10	20
Waterborne	5	24
Seaplane	0	1
Total - Number	15	45
Total - Percent	25%	75%

5.13.8 What is the number of preventable maintenance calls made during FY 1996? {Reported below are the number of systems that reported preventable maintenance road calls.}

Thirty percent reported preventable maintenance calls made during FY 1996. VTSs with larger fleet size typically report a higher number of road calls than smaller systems. However, a better comparison is the number of road calls per peak operating requirement. In this respect, waterborne systems have a higher percentage of preventable maintenance calls than surface systems. Table 54 lists the number of VTSs that have preventable maintenance calls.

Table 54: VTSs with Preventable Maintenance Calls

VTS Group	Yes	No	NR
Surface	8	21	1
Waterborne	10	19	0
Seaplane	0	0	1
Total - Number	18	40	2
Total - Percent	30%	67%	3%

NR = no response from the VTS provider.

5.14 What Future Plans are There for the VTS Service?

5.14.1 Are there plans under consideration to modify the VTS Service?

More than two-thirds of VTSs have plans to modify their VTS service. A higher percentage of surface VTSs (77%) have plans to modify their system than waterborne VTSs (59%). Specific plans are discussed in the section on VTS Needs. It should be noted that

this data does not include plans by other park units that are considering implementing a VTS service. Table 55 lists the number of VTSs with plans to modify their VTS service.

Table 55: VTSs with Plans for Future Modifications

VTS Group	Yes	No
Surface	23	7
Waterborne	17	12
Seaplane	1	0
Total - Number	41	19
Total - Percent	68%	32%

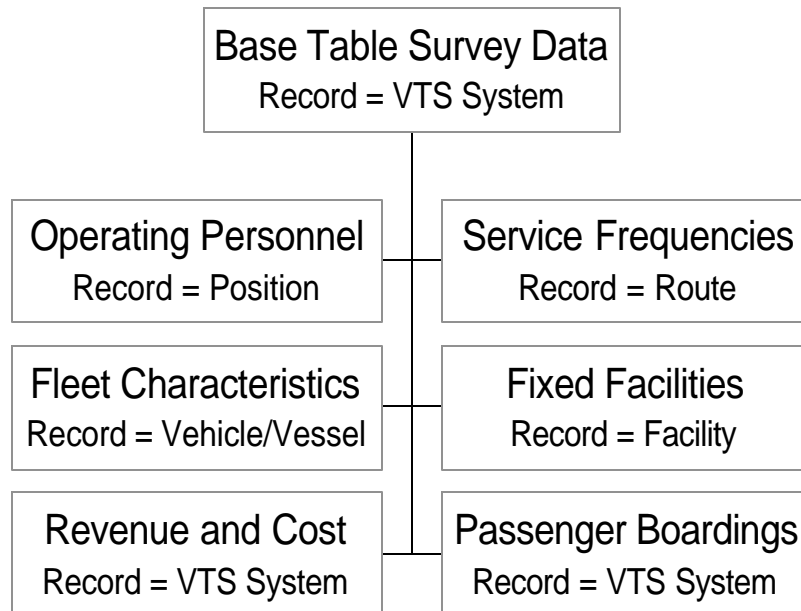
6. SUMMARY OF VTS DATA BASE SYSTEM AND PROCEDURES

6.1 VTS Database

A database system was developed for the VTS inventory, based on the information that was compiled during the survey. The database is designed to be user friendly and allow information to be easily updated and easily retrieved. The database system uses Microsoft Access for Windows 95 and contains tables, queries, forms and reports to easily access the information in the database.

The database consists of seven primary tables. The tables include: base survey data, operating personnel data, data on service frequency, fleet characteristics, data on fixed facilities, passenger boardings, and revenue/cost data. The Base Table contains most of the survey data that was requested on the questionnaire. The other tables contain data that was requested on the forms that were attached to the questionnaire.

The boxes below illustrate the structure that was used to develop the VTS database, including the relationship between the database tables and a brief explanation of the data contained in each record of each table. All of the tables are linked by a VTS ID number.



6.2 VTS Database Procedures

A uniform data collection system for all units that is updated on a continual basis will provide information needed to understand visitor transportation at National Park Service units. The data collection system should be established with a clear mission to enhance visitor transportation.

A clear benefit to a uniform database is the potential for additional funding. By providing a national perspective and needs assessment, funds may be sought to make needed improvements. However, equally important are the benefits to local units to have up-to-date information to better design, manage, operate, and maintain VTSS.

If park units recognize the benefits of a central database, then they will provide the requested data. Also, data reporting requirements should be limited to a minimum amount; otherwise the VTS database will collapse under the weight of onerous data reporting and processing requirements.

The development of the data collection procedure and the administration of a central VTS database should be considered in the light of the recent memorandum of understanding between the National Park Service and the U.S. DOT Federal Transit Administration (FTA). Currently, the FTA maintains records for public transportation systems that receive federal funds. Public transit systems that receive federal funds are responsible for providing quarterly reports to the FTA. The FTA summarizes the quarterly reports and publishes reports on an annual basis.

The NPS visitor transportation systems have unique operating characteristics with different objectives than most public transit systems. The need to provide quarterly reports is not necessary. The following procedures are recommended for the updating of the VTS database:

1. Provide a report on an annual basis, consisting of the following information:
 - Ridership Data
 - System Description
 - Operations Data
 - Performance Data
 - Cost and Revenue Data
 - Future Plans
2. Simplified data request forms should be developed that include:
 - A brief form (no more than one page) if no major changes to the system have been made over the course of the previous year.
 - Simple forms for major changes (e.g., no more than a third of a page for each major VTS asset).
3. A summary report or newsletter should be circulated to all park units that manage VTSSs for information exchange and networking.
4. The administration and maintenance of the VTS database could be located in Denver, Colorado. Currently, transportation planners at the Denver Service Center assist park units in the planning and design of VTSSs. Also, the Field Operations Technical Support Center (FOTSC), a branch of the Facilities Management Division provides guidance for operation and maintenance of VTSSs. Staff from both Centers are located in Denver and will use information contained in the database.

7. SURVEY OF NON-NPS SYSTEMS

7.1 Introduction

The primary focus of the study is NPS VTS services. However, data was collected for a representative number of relevant private or government systems to provide a more complete picture of system design and operation possibilities. This section of the report provides a summary of the results of the site visits to non-NPS Visitor Transportation Systems.

7.2 Site Visits

To meet one of the objectives of the study, several relevant non-NPS visitor transportation systems were selected. These systems are comparable in terms of ridership levels, type of service, and quantity of service. Two areas of the country were selected to gather information for relevant non-VTSs: Eagle County, Colorado, and Puget Sound, Washington.

7.2.1 Eagle County, Colorado

The Eagle County area was selected to gather information for surface VTSs. This area was chosen because it has a high volume of visitors, and it has definite seasonal characteristics. Peak season occurs during the ski season, and to some extent during the summer when tourists like to vacation in the Rocky Mountain area. The number of visitors drop off considerably during the "mud seasons", which include several weeks between ski season and summer, and several weeks between summer and ski season. Typically, during the off-peak season, the hours and frequency of visitor transportation service are reduced.

In 1995, Eagle County's permanent population was approximately 28,000 persons with a peak season population of 48,000 persons. Vail, which is the largest community has a permanent population of 5,200 persons with a peak season population of 11,000 persons. Last year, there were 1.7 million skier-days at Vail and 650,000 skier-days at Beaver Creek. Approximately 70% are destination skiers, 20% are local front-range skiers, and 10% are international skiers.

Within the Eagle County area is a variety of surface transportation systems, including a mix of fixed-route service, shuttle service, and dial-a-ride service. The systems are operated by public and private entities.

The site visits focused on the primary visitor areas of Avon, Vail, and Beaver Creek. Table 1 provides a summary of four major visitor transportation systems are provided in the Vail, Avon, and Beaver Creek area.

Table 56: Non-NPS Surface Visitor Transportation Systems

System	Number of Routes	Fleet	Annual Ridership
Eagle County RTA	5 fixed routes Paratransit service	23 buses	416,000
Town of Avon Transit System	4 fixed routes	5 cutaways 1 van 6 buses	238,000
Town of Vail Transit System	7 fixed routes Paratransit service	6 cutaways 1 suburban 15 buses	3,100,000
Beaver Creek Resort Company	4 fixed routes Dial-a-ride	Cutaways and Suburbans	824,000

7.2.1.1 Eagle County Regional Transportation Authority

The Eagle County Regional Transportation Authority (ECRTA) was established in 1996 and is supported by a ½ cent sales tax that was approved by voters in November 1995. The ECRTA provides point-to-point service between major communities to meet regional transportation demand. The ECRTA provides five regional bus routes in conjunction with paratransit service. These routes serve communities along the I-70 and US 24 corridors. The transit fleet consists of 23 buses. Twenty-one buses are owned by the ECRTA. Two buses are leased by the ECRTA. The transit service is operated under a contract with the ECRTA by the Town of Avon. Annual ridership is 416,000 passengers. The highest demand occurs during the winter, December through March, during which time over 70 percent of the ridership occurs. The base fare is \$2.00 one way for most routes. The fare for the Leadville route is \$3.25 one way. The transit service is funded by a countywide sales tax, and contributions from the Town of Vail, Avon, Eagle County, and the Beaver Creek Resort Company.

7.2.1.2 Town of Avon Transit System

The Town of Avon's local bus system provides transit service to the population centers of the community. It includes four fixed-routes that operate only during the winter months. The transit fleet consists of five cutaways (cutaways are buses that are manufactured on a single unit truck chassis), one van, and six buses. Annual ridership is 238,000 passengers. The highest demand occurs during the winter, December through March, during which time approximately 90 percent of the ridership occurs. No fare is charged. The transit service is funded through the Town's general fund and contributions from Beaver Creek Resort. The Town of Avon also provides charter service and special events, which carried an additional 34,000 riders in 1996.

7.2.1.3 Town of Vail Transit System

The Town of Vail's bus system provides in-town shuttle service. It includes seven fixed routes. Two of the routes operate during winters only. Paratransit service is also provided with 24-hour notice. The transit fleet consists of six cutaways, 15 buses, and one suburban. Annual ridership is 3,100,000. The highest demand occurs during the winter, December through March, during which time approximately 60 percent of the ridership occurs. No fare is charged. The transit service is funded primarily through a \$4.00 surcharge on lift tickets.

7.2.1.4 Beaver Creek Resort Company Transit System

Beaver Creek Resort Company provides a privately funded and operated fixed route service and dial-a-ride service within the resort community of Beaver Creek. The fixed route service consists of four routes that operate with cutaways. The dial-a-ride service consists of fleet of suburbans that access residential areas that are difficult to serve by the cutaways, especially in adverse weather conditions. The dial-a-ride also provides service to the community when the fixed route service is not operating. Annual ridership is 824,000. No fare is charged. The Beaver Creek Resort transit system is privately funded and chose not to disclose financial data.

7.2.2 Lessons Learned From Eagle County

The primary purpose for visiting the surface transportation systems in Eagle County was to learn how non-NPS providers design, operate, and maintain their systems. There is a wide range of services in Eagle County from which the National Park System can learn several lessons. These lessons fall into the following categories: system design, operations, and maintenance.

7.2.2.1 Systems Design

Non-NPS providers design their visitor transportation systems to meet the market demand, terrain, and the environmental conditions of the area. In Eagle County, the market demand generally falls into two categories: 1) residents and employees; and 2) tourists, shoppers, and visitors. The demand for transit services fluctuates, depending on the season. The terrain of Eagle County is mountainous with communities oriented in a linear fashion in valleys and along hillsides. The major environmental factors taken into account are weather, and the impact of the automobile on the community, particularly in terms of traffic congestion and parking.

The Eagle County area is a good example of a "layered" transportation system that is designed to accommodate the transit demand at both the regional level and at the local level. At the regional level, the Eagle County Regional Transportation Authority (ECRTA) provides transit service between local communities. One of the primary functions of ECRTA regional service is to transport employees to their place of work. Some ECRTA service is oriented towards visitors, such as the shuttle between Vail and Avon. Because of the terrain, the design of the regional route system is generally linear between communities.

At the local level, bus routes circulate within the communities of Avon and Vail to shuttle people to various activities, including work, shopping, and recreation. In areas with limited parking, high pedestrian traffic, and concern for the environment (i. e., Vail Village and Beaver Creek Resort), autos are restricted and the transit systems provide the primary access.

The Beaver Creek Resort Company (BCR) operates a mini-layered transit system within the resort. The BCR contracts with the Town of Avon to shuttle visitors and employees from two large remote parking lots at the edge of the resort area up to the central Village. Private automobiles are not allowed in the resort, except for residents. Currently, the BCR is studying the feasibility to replace the remote parking lot shuttle bus system with a funicular system. Also, within the resort area, the BCR also provides fixed route bus service along major streets and dial-a-ride service that provides door-to-door service for residents.

7.2.2.2 Operations

Transit operations in Eagle County respond to the seasonal demand. During peak seasons, transit operations are in full swing. During the off peak, operations are scaled back considerably. Some routes are not operated during the off-peak seasons. During the peak season (December through March), the transit systems carry 60 to 90 percent of the ridership.

Providing an adequate labor force to operate the transit systems during the peak seasons is a problem. Because the cost of housing is high, it is difficult to attract employees. Therefore, some systems provide affordable housing for their employees. For example, the Vail Transit system is currently building employee housing next to their bus maintenance facility. It is interesting to note that the Vail Transit has held job fairs in Yellowstone National Park to encourage workers to relocate to Vail during the winter ski season.

Operations data is collected by the transit providers to monitor and evaluate transit operations. Ridership data is usually collected on a daily basis by route. Periodically, boarding and alighting counts are collected by bus stop to determine usage and perform route segment analysis. Other operations data such bus miles, service hours, and schedule adherence are regularly collected. In addition, data is obtained from comprehensive surveys of bus passengers to determine customer satisfaction and to conduct detailed assessments of transit services.

The data regarding the cost to operate the system (e.g., labor, vehicles and equipment, fuel, tires, administration, marketing, etc.) are carefully maintained by the transit systems. If a transit system receives federal funds, then operations and cost data are reported to the Federal Transit Administration. These reports are submitted quarterly.

Table 3 and 4 provide an example of how operations and cost data can be used to compare systems. The operating characteristics of three transit systems in Eagle County are listed in Table 3. A review of the data indicates that the commuter-oriented ECRTA regional service has longer trips and fewer passengers than the local shuttle services provided by Avon and Vail. Consequently, the ECRTA riders per mile and riders per hour is less than Avon and Vail shuttle services.

Table 57: Operating Characteristics for Eagle County Transit Providers

System	Annual Ridership	Vehicle Miles	Vehicle Hours	Riders per Mile	Riders per Hour
ECRTA	416,000	668,544	32,144	0.6	13.4
Vail	3,100,000	578,504	54,404	5.36	57.0
Avon	238,000	117,695	10,866	2.02	21.9

Table 4 illustrates cost differentials between the regional and local transit services in Eagle County. The ECRTA cost per mile is less because the regional routes operate on highways and freeways where the operating speeds are higher than local shuttle services. The cost per hour is slightly higher, but relatively comparable to local service. This indicates that labor rates are probably comparable. The ECRTA cost per rider is high because the regional service carries less passengers over longer distances than the local shuttle services.

A comparison of the local shuttle services of Avon and Vail indicates that the Vail service is more cost effective than Avon. However, it should be noted that the cost for the transit system service in Vail may not be directly comparable with that of the other systems due to differences in the classification of overhead cost items.

Table 58: Cost Effectiveness for Eagle County Transit Providers

System	Total Cost	Cost per Mile	Cost per Hour	Cost per Rider
ECRTA	\$1,276,000	\$1.91	\$39.70	\$3.07
Vail	\$1,964,000	\$3.39	\$36.10	\$0.63
Avon	\$416,000	\$3.53	\$38.28	\$1.75

7.2.2.3 Maintenance

In Eagle County, during the off season when passenger demand is low, major vehicle maintenance is performed. This allows the transit systems to extend the life of the vehicles and to operate at lower spare ratios. For example, almost half of the transit coaches are 12 years or older.

According to local transit representatives, covered storage significantly reduces vehicle maintenance costs. Also, it is easier for mechanics to start vehicles on cold mornings when vehicle shelter is provided. The remoteness of location contributes to maintenance costs because the transit operator must transport vehicles longer distances for major repairs.

Typically, maintenance records are kept for all of major assets in a transit system. The Avon Transportation Division maintains an extensive computer system that tracks all operations and maintenance costs. This is accomplished by an off-the-shelf software package that is designed to track such costs. The Town of Avon also maintains the ECRTA vehicles and the Beaver Creek Resort transit vehicles. The Vail transit vehicles are maintained by Vail Transit.

7.2.3 Puget Sound, Washington State

The Puget Sound region in Western Washington State was selected to gather information regarding ferry systems. The Puget Sound region is rich with ferry providers. The largest ferry system in the United States, Washington State Ferries, is located in the Puget Sound area. In addition, numerous smaller operators provide ferry service and boat excursion trips on Puget Sound.

The ferry systems in Puget Sound are operated by public and private entities. Washington State operates the Washington State Ferries system, Pierce County operates a ferry between Steilacoom and Anderson Island, Skagit County operates the Guemes Island Ferry, and Whatcom County operates the Lummi Island Ferry. There are numerous privately-operated ferries and boat excursions throughout Puget Sound.

In the three-day field trip to Puget Sound, five ferry systems were visited. Table 5 provides a listing of four of the five the systems that were visited. The ferry systems in the Puget Sound region vary significantly, depending on the nature of the service. The following is a brief description of the services that were visited.

Table 59: Non-NPS Waterborne Visitor Transportation Systems

System	Number of Routes	Number of Vessels	Annual Passengers
Horluck Transportation	Two passenger only route	4	465,000
Washington State Ferries	Eight routes that carry vehicles and passengers and two passenger only routes	25	25 million
Puget Sound Express	One passenger only route	1	6,000
Tillicum Village / Argosy Tours	One passenger only route	16	90,000

7.2.3.1 Horluck Transportation System

The oldest continuously operated ferry system in Washington State is the Horluck Transportation System. Since 1924, Horluck has been providing ferry service between Port Orchard and Bremerton. Currently, Horluck provides two passenger-only ferry routes. One route runs from Port Orchard to Bremerton. The other route runs between Bremerton and Anapolis. Horluck has four vessels, varying in age from 1917 to 1981. The vessels carry between 80 and 150 passengers. The ferry service operates year round and carries 465,000 annual passengers.

7.2.3.2 Washington State Ferries

The Washington State Ferries (WSF) provides year-round ferry service. The WSF operates 10 routes and 25 vessels. It carries over 9 million vehicles and nearly 25 million passengers, more than any other system in the nation. The ferry system serves as an extension Western Washington's highway network by providing critical links between the urban areas on the east side of Puget Sound and the communities to the west on the Kitsap Peninsula as well as more rural destinations on the Olympic Peninsula.

The WSF is also a mass transit system that is used by many walk-on passengers. The majority of walk-ons are found on routes that serve downtown Seattle where many jobs are within walking distance to the ferry terminal. Every ferry terminal outside of the Anacortes-San Juan Islands has connecting transit service.

The WSF is the State's largest tourist attraction. Each year thousands of out-of-state visitors ride a ferry on a scenic trip through the San Juan Islands or to other destinations around Puget Sound.

Since the WSF operates in international waters, it will adopt the International Safety Management (ISM) Code, which is mandated by the International Maritime Organization. The purpose of the ISM Code is to provide an international standard for the safe management and operation of ships and for pollution prevention. The WSF plans to adopt appropriate sections for its domestic routes.

7.2.3.3 Puget Sound Express

The Puget Sound Express is a family-owned business that is primarily a tourist-oriented passenger only ferry system. The ferry is an 81-mile round trip service between Port Townsend and the San Juan Islands. The Puget Sound Express is also a regular service for families traveling between Port Townsend and the San Juan Islands. In addition, the Puget Sound Express provides excursions for whale watching.

7.2.3.4 Tillicum Enterprises and Argosy Tours, Inc.

Tillicum Enterprises has a Concession Lease Agreement with the Washington State Parks and Recreation Commission to operate Tillicum Village on Blake Island. Blake Island is a state park. Tillicum Enterprises operates a restaurant, sells souvenirs and gifts, and provides entertainment to restaurant visitors consistent with a Northwest Coast Native American theme. In compensation for these rights and privileges, the concessionaire pays a fee of 6% of gross revenues. Tillicum Enterprises charters their boat transportation from Argosy Tours, Inc. Argosy Tours transports visitors from the Seattle waterfront to Tillicum Village on Blake Island.

7.2.3.5 Victoria Clipper

The Victoria Clipper operates high-speed catamaran passenger ferry service between downtown Seattle and Victoria Island, British Columbia. In addition, Victoria Clipper also provides excursion trips between Seattle, San Juan Islands, Victoria BC, Vancouver Island, and Vancouver, BC. The Victoria Clipper is a private operation and chose not to disclose ridership and cost statistics.

7.2.4 Lessons Learned from Puget Sound Visits

The primary purpose for visiting the ferry systems in the Puget Sound region was to learn how other providers design, operate, and maintain their systems. As with Eagle County experience, there is a wide range of services designed for specific purposes. Commensurately, the operations and maintenance aspects are particular to the service that is provided.

7.2.4.1 Systems Design

Ferry systems design includes route planning, passenger capacity planning, land side facilities (docking facilities, terminals, and parking), intermodal connections, reservation systems and fare collection. Intermodal connections are a serious problem for ferries that carry vessels. In particular, queuing capacity at docks for vehicles waiting to drive on to the vessels can be a nightmare. Fortunately, the ferry systems in the National Park System are primarily passenger only and do not have this problem.

Of all the ferry systems visited, the Tillicum Village service appears to be the most similar to NPS visitor transportation systems. Argosy Tours, Inc. operates the ferry system in a state park under contract with a concessionaire. The design of the route is simple. A single fixed 20 mile route is provided between the Seattle waterfront and Blake Island. An added feature of the boat trip is an integrated interpretative tour of the Seattle waterfront as the ferry makes its way out to Blake Island, which is in the middle Puget Sound. Argosy Tours has sufficient boat of varying passenger capacity to handle all passenger loads.

On the land side, the docks at the Seattle waterfront are owned by Argosy Tours. Argosy Tours also leases pier space for passenger access and the ticket booth. Argosy Tours offices are located at the end of the pier. Customers can be dropped off at the pier, park at private lots and parking garages, or use public transportation. On Blake Island, the docks are owned by State Parks and used by Argosy Tours as part of the concessionaire agreement.

Tillicum Enterprises has an advance reservation system for customers to reserve space. Customers may also walk up to the and buy tickets at the ticket booth located next to the dock at the Seattle waterfront pier.

Ferry systems in Puget Sound are relying more on public transit systems to bring passengers to the ferry terminal to reduce the intermodal problems. For example, the Horluck Transportation System has integrated the local transit system into the ferry service. Under agreement with Kitsap Public Transit, Horluck honors Kitsap Transit's transit passes. Horluck records the number of passengers that have transit passes and Kitsap Transit pays Horluck for each passenger trip. This strategy benefits the passenger by reducing fares; it benefits the ferry system by increasing revenues and reducing parking demand; and it benefits the transit system by reducing operating cost and encouraging people to use public transportation.

7.2.4.2 Operations

All of the ferry systems in the State of Washington are regulated by the Washington State Utilities and Transportation Commission (UTC). The UTC regulates ferry operations, schedules, and fares.

Table 6 provides a listing of the annual riders, operating cost and average cost per rider. Horluck has the lowest cost per rider. Washington State Ferries has a higher cost. Some of WSF's higher cost is driven by state requirements to provide less cost effective services. The Puget Sound Express has a higher cost due to the nature of the trip, including the length and "excursion" nature of the trip. The average cost for the Tillicum Village boat service includes what Argosy Tours, Inc. charges Tillicum Enterprises.

Table 60: Operating Characteristics for Non-NPS Ferry Providers

System	Annual Riders	Annual Operating Cost	Average Cost per Rider
Horluck Transportation	465,000	\$478,000	\$1.03
Washington State Ferries	25 million	\$177 million	\$7.08
Puget Sound Express	6,000	\$350,000	\$58.00
Tillicum Village / Argosy Tours	90,000	NA	\$7.26

7.2.4.3 Maintenance and Inspection

The United States Coast Guard carries out the inspection of vessels required to be inspected under Title 46. The inspections of vessels is required by statute, however the specific procedures are set out in Coast Guard regulations.

Recently, the United States Coast Guard proposed a self-inspection program, in which operators inspect their vessels. The streamline program is outlined in Federal Register Vol. 62, Number 67, Tuesday, April 8, 1997, 46 CFR Part 8 CGD 96-055. The program offers an alternative method of complying with Coast Guard inspection requirements. Vessel owners or operators would have their own personnel periodically perform many of the tests and examinations conducted by Coast Guard marine inspectors. Vessel owners and operators opting to participate in the program would maintain a vessel in compliance with a Vessel Action Plan (VAP).

8. VTS ASSESSMENT

8.1 VTS Objectives

As parks become more crowded, the National Park Service is turning to transit to solve its dilemma of protecting the nation's top treasures while at the same time providing visitor access and enhancing visitor enjoyment. As a consequence, new VTSs are springing up and older systems are being replaced. By 2005, a light rail transit system is envisioned for Grand Canyon. At Yosemite, a new system is being proposed to lessen traffic congestion that will intercept visitors at gateway communities and transport them to park destinations.

Four principles guide the development of VTS:

Visitor Enhancement. The VTS enhances the visitor's experience by offering interpretive opportunities, simplifying travel within the park or making it easier to see park features.

Resource Protection. The VTS reduces traffic congestion, noise, air pollution and adverse effects on park resources and values.

Cost Effectiveness. The VTS is a cost-effective alternative to the construction of additional roads, parking and support facilities.

Sustainability. The VTS conserves energy and provides more sustainability for the park or park unit.

The design of VTSs should be based upon the guiding principles for Visitor Transportation Systems in National Park Service units. Based on survey results, visitor enhancement is the primary purpose for 67% of the VTSs. Resource protection is the primary purpose for 26% of the VTSs. Cost effectiveness is the primary purpose for 7% of the VTSs. No VTS listed sustainability as the primary purpose of the VTS.

8.2 VTS Performance

8.2.1 Operations Performance

For the purpose of this study, operations performance is measured in several ways, including the percent of trips during the peak season that are at capacity or over capacity, on-time performance, failure to operate due to equipment shortage, and failure to operate due to driver or, in the case of a waterborne VTS, a pilot and/or other personnel shortage.

Respondents reported that at least two-thirds of the VTS routes have trips where at times vehicles are filled to capacity trips during the peak season. In fact, at least 78% of VTS routes have some trips where riders are left behind. Several park units have indicated a need to increase the VTS fleet size to accommodate high passenger demand during the peak season. This information indicates that the VTSs in National Park Service units are well utilized.

On-time performance is a problem at several park units. Respondents did not provide on-time performance data for thirty-six percent of the routes. However, based on data that was collected, at least eighteen percent of routes have an on-time performance below 90 percent of the time during the peak season. This indicates that there are major scheduling problems in some park units, and a need for more comprehensive operations analyses.

Better data tracking methods should be established and incorporated into VTS contracts, concessionaire agreements, and permits. To date, many VTSs do not keep detailed operations records and do not perform comprehensive operations analyses. By establishing a comprehensive data reporting system, park units will be able to report operations data. Thus, effectiveness measures can be developed based on factual data to determine VTS performance, operating efficiency and cost effectiveness.

VTS operations performance is also affected by shortage of operable equipment and/or shortage of drivers and pilots. Twenty-five percent of VTSs indicated that service failed to operate due to a shortage of operable equipment. Five percent of VTSs reported a failure to operate a scheduled trip due to shortage of drivers.

8.2.2 Maintenance Performance

Maintenance performance is measured in several ways, such as the condition of vehicles and vessels, the condition of VTS facilities, the amount of shopped vehicles during peak season, preventable maintenance calls, and the use of established maintenance procedures.

Overall, a higher percentage of surface VTS vehicles and facilities are below average condition than waterborne VTSs. Likewise, a higher percent of surface VTS have shopped vehicles during peak operating season. This is probably due to US Coast Guard regulations and stringent inspection programs that require vessels to be in satisfactory operating condition.

Unfortunately, maintenance procedures are not established at many VTSs. Approximately half of all VTSs do not have written maintenance programs and procedures for hazardous wastes. Only one-third of VTSs have written training programs and safety programs for vehicle and vessel maintainers.

9. VTS NEEDS

The needs of National Park Service VTSs are described in this section. These needs are divided into VTS program needs, surface VTS needs, waterborne VTS needs, and seaplane VTS needs. It should be noted that the needs listed are based on input from existing VTSs and do not include the needs of park units that need a new VTS.

9.1 VTS Program Needs

The VTSs in the National Park Service have equipment and facility deficiencies and a program is needed to address these needs. The results of the VTS survey indicate the following:

- Approximately 16% of vehicles and vessels used in VTS service are below average condition.
- Many VTS vehicles are over 12 years old, which is the normal replacement age for standard transit coaches.
- Approximately 13% of the VTS facilities (garages, maintenance facilities, docks, etc.) are below average condition.
- More than two-thirds of VTSs have plans to modify their VTS service. A higher percentage of surface VTSs (77%) have plans to modify their system than waterborne VTSs (59%).
- There is no NPS system-wide program to adequately fund the replacement of old and worn out vehicles and/or the maintenance and/or replacement of needed VTS facilities.

9.2 Surface VTS Needs

Table 61: Surface VTS Needs

NPS Unit	VTS Name	VTS Group	Planned Modifications
Adams National Historic Site	Trolley Bus	Surface	Park would prefer changing service to 2 smaller trolleys instead of one large trolley. However, funds are limited.
Big South Fork NRRRA	Big South Fork Scenic Railway	Surface	Present operation is under 1 year permit. If successful, will bring under concession arrangement.
Canyon De Chelly National Monument	Truck Tours to Canyon Bottom	Surface	Concessioner requested variable number of vehicles allowed in canyon per day. A carrying capacity study is needed.
Cape Cod National Seashore	Coast Guard Beach Shuttle	Surface	In process to acquire new alternative fueled tram.
Cuyahoga Valley NRA	Cuyahoga Valley Scenic Railroad (CVSR)	Surface	NPS and CVSR are cooperatively planning extending service north and south of CVNRA to Cleveland and Canton.
Denali National Park and Preserve	Denali National Park Transportation System	Surface	Add a round trip bus to Savage River.
Eisenhower National Historic Site	Gettysburg Tours Inc.	Surface	The site is preparing a Development Concept Plan. Access to and around the site is an issue.
Glacier National Park	Sun Tours	Surface	Possibly adding half day trips.
Grand Canyon National Park	Free Park Shuttle	Surface	The GMP, approved in 1995, specifies major expansion, including light rail.
Harpers Ferry National Historic Park	The Valley Line	Surface	The Driver Training Program is currently being revised.
Lowell National Historic Park	Trolley	Surface	Looking at the feasibility of operating the trolley by all or partial volunteers.
Lyndon B. Johnson National Historic Park	LBJ Ranch Bus Tour	Surface	Plans under consideration to replace current interpretative tour with a shuttle system and to relocate maintenance operations off-site.
Mesa Verde National Park	Tram Operation - Wetherill Mesa	Surface	This year the VTS has experienced more breakdowns with the trams than in the past. However, the concessioner is in process of purchasing two new trams for next season.
Mount Rainier National Park	Rainer Overland, Inc.	Surface	Currently exploring expanded VTS as part of a new GMP, which is scheduled for completion in 1999.
Mount Rainier National Park	Rainer Shuttle, Inc.	Surface	Currently exploring expanded VTS as part of a new GMP, which is scheduled for completion in 1999.
National Capital Parks-Central	Landmark Services Tourmobile, Inc.	Surface	Draft study recommends increase in capacity, frequency and area serviced by VTS, with goal to move visitors from parking areas to numerous locations within park.
North Cascades National Park	NPS Stehekin Shuttle System	Surface	NPS would like a private operator to provide service, but no one is willing due to narrowness and roughness of road, and low number of passengers.
Point Reyes National Seashore	Whale Shuttle	Surface	Contract with charter bus company for full-size buses with nominal fare. Buses will be mandatory in lighthouse portion of park. Changes implemented in 1998 and will replace former van service.
Rocky Mountain National Park	Bear Lake Visitor Transportation System	Surface	Increase Moraine Park Route from 1 trip per hour to every 30 minutes. Encourage visitors to use VTS.
Valley Forge National Historic Park	Romano's School Bus Service Valley Forge Tours	Surface	If requested, Concessioner to provide at least one guided tour per day. Concessioner to pay NPS for guide service and may pass cost forward in form of a higher fare.
Yosemite National Park	Yosemite VTS	Surface	Future thrusts for the VTS could include expanded service in

NPS Unit	VTS Name	VTS Group	Planned Modifications
			other areas of the park such as the west end of Yosemite Valley, Badger Pass to Glacier Point, Wawona to Yosemite Valley, Yosemite Valley to Tuolumne Meadows, etc.
Zion National Park	Zion Lodge Transport System	Surface	Zion National Park plans to institute mandatory VTS for six mile scenic drive. VTS will operate under service contract, rather than concessioner.

9.3 Waterborne VTS Needs

Table 62: Waterborne VTS Needs

NPS Unit	VTS Name	VTS Group	Planned Modifications
Cape Lookout National Seashore	Alger G. Willis Fishing Camps, Inc.	Water	New contract being prepared. NPS wants greater passenger service "on demand" via smaller, faster boats. Less mixing of passengers and vehicles. No changes planned until new contract is bid in 1-2 years.
Cape Lookout National Seashore	Morris Marina, Kabin Kamps & Ferry Service Inc.	Water	New contract due in 1998. Improved ferry service will be required.
Channel Islands National Park	Island Packers Boat Transportation	Water	The park anticipates authorizing additional concessioners operating in different areas of the park.
Crater Lake National Park	Boat Tour Service	Water	Draft Visitor Services Plan calls for frequency of boat tours to be reduced from 9 boat tours daily to 7 boat tours daily.
Cumberland Island National Seashore	Cumberland Island National Seashore Ferry	Water	The Concessioner may be asked to take over the Park's visitor reservation system. Park has a 300 visitor per limit.
Fire Island National Seashore	Davis Park Ferry Service	Water	Upgrade vessels and facilities for comfort and demand
Fire Island National Seashore	Sayville Ferry Service Inc.	Water	New ferry dock at Sailors Haven - HC accessible. Hoped for more promotions with Howard T. Rose Terminal upgrades on mainland.
Golden Gate National Recreational Area	Alcatraz Island Ferry Service	Water	The NPS is undertaking a planning project to consider the full scope of services to be included in the next concessioner contract.
Isle Royale National Park	Copper Harbor	Water	Existing services have been in place for many years and serve the public and park very well. However, few funds have been available for either annual or cyclic dock maintenance for many years.
Isle Royale National Park	Grand Portage	Water	Existing services have been in place for many years and serve the public and park very well. However, few funds have been available for either annual or cyclic dock maintenance for many years.
Isle Royale National Park	Ranger III	Water	Existing services have been in place for many years and serve the public and park very well. However, few funds have been available for either annual or cyclic dock maintenance for many years.
Isle Royale National Park	Rock Harbor	Water	See above
Virgin Islands National Park	Buck Island / Mile Mark Charters	Water	Concessioner employees will be required to wear emblems on clothing to identify as concession operation. Alcoholic beverages will be prohibited.
Virgin Islands National Park	Buck Island / Southern Seas Inc.	Water	See above

9.4 Seaplane VTS Needs

Table 63: Seaplane VTS Needs

NPS Unit	VTS Name	VTS Group	Planned Modifications
Isle Royal National Park	Seaplane Service	Seaplane	Existing services have been in place for many years and serve the public and park very well. However, few funds have been available for either annual or cyclic dock maintenance for many years.

10. RECOMMENDATIONS

A Visitor Transportation System (VTS) is an important element in many park units and is needed to provide access to valuable resources and to protect those resources. A comprehensive program is needed to assist National Park Service units in the design, construction, operation, and maintenance of VTSs. Such a program, similar to the Federal Lands Highway Program (FLHP), should be instituted for the maintenance of existing VTSs, and the development of needed VTSs.

10.1 VTS Systems Design

The following issues should be addressed in the design of VTSs:

- Does the VTS reduce traffic congestion, noise, air pollution and adverse effects on park resources and values?
- Are there opportunities to enhance the visitor experience by offering interpretative opportunities, simplifying travel within the park, or making it easier to see park features?
- Is the VTS a cost-effective alternative to constructing additional roads, parking and support facilities?
- Does the VTS conserve energy and provide more sustainability for the park unit?
- Does the VTS route structure and service type (e.g., fixed-route, demand-response, etc.) respond to the passenger demand, terrain, and environmental factors of the park unit and surroundings?
- Do the characteristics of the vehicles or vessels specified for the visitor transportation system match the operating requirements and environmental features of the park unit?
- Are there adequate facilities for passenger services and maintenance requirements?

10.2 VTS Operations

The following issues should be addressed in the review of VTS operations:

- Are regular counts kept of the number of visitors that use the VTS service?
- Is there enough vehicle and/or vessel capacity during peak seasons to accommodate peak passenger demand?
- Does the system operate on time?
- Has the system failed to operate a scheduled trip due to shortage of an operable vehicle and/or vessel?
- Does the system have spares in case a vehicle or vessel breaks down?
- Has the system failed to operate a scheduled trip due to a shortage of drivers, pilots, or other personnel?
- Does the system accommodate the disabled community, as required by ADA?
- If fares are collected, is there a secure and audited fare collection system in place?
- Does the system maintain detailed revenue and operating cost records?
- Does the system have adequate safety and liability programs?
- Does the system operate in international waters and meet international requirements?
- Are there passenger complaints that should be addressed?

10.3 VTS Maintenance and Inspection

The following issues should be addressed in the review of the maintenance and inspection of VTS equipment and facilities:

- Are there written inspection and maintenance programs for both the fleet and the facilities of the visitor transportation system?
- Do the maintenance and inspection programs meet federal and local requirements?
- Are the maintenance and inspection programs approved by the federal and local regulating agencies?
- Does the appropriate records maintained and does the system routinely track breakdowns and failures?
- Are there written safety and training programs for maintenance staff?

- Does the system operate in international waters and meet international requirements?

10.4 VTS Database

The following are recommended in the data collection and administration of the VTS database:

- A uniform data collection system for all units updated on a continual basis should be established to provide information needed to understand visitor transportation at National Park Service units.
- The data collection system should be established with a clear mission to enhance visitor transportation.
- The database should be updated on an annual basis.
- Simplified data request forms should be developed for the annual updates.
- The location and administration of the VTS database should be established at the Denver Service Center.
- Reporting requirements should be established for new VTS contracts and concessions that include data requirements for the VTS database.

10.5 Specialized Transportation Expertise

Visitor transportation systems transportation systems have unique design, operating, maintenance, inspection, and safety requirements. Therefore, specialists should be designated by NPS to review surface transportation systems and waterborne transportation systems and to assist in the negotiation of new VTS contracts and concessions.

Appendix