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NPS FOIA OFFICER
12795 W. Alameda Parkway
P.O. Box 25287
Denver, CO 80225
Fax: 303-969-2557
FOIA.gov

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United States Department of the Interior
NATIONAL PARK SERVICE
Interior Regions 3,4,5
601 Riverfront Drive
Omaha, NE 68102

9.C. (MWR-FOIA)

July 21, 2023

Via Electronic Mail

Reference: DOI-NPS-2023-004468

Subject: Freedom of Information Act Request

This letter is our final response to your Freedom of Information Act (FOIA) request 05/10/2023 in which you requested:

A copy of the following pages only from the document: Gateway Arch Transportation Facilities: Management, Operations, Maintenance, and Physical Condition: Title page, pages i through iv (or v) (table of contents and summary), and pages 1-28 (introduction and review of management and operations), and pages 46-47 (conclusions and recommendations).

It has been assigned FOIA Number DOI-NPS-2023-004468. Any correspondence, with this office, regarding this request should cite this number.

Full Release—43 C.F.R. § 2.22

We are writing today to respond to your request on behalf of the National Park Service.

We have attached one PDF, consisting of 31 pages, being released to you in their entirety.

Pages 25-28 of the manual were found to be outside of the introduction and review of management and operations, and as such are non responsive to your request.

Colleen Burnidge, Attorney- Advisor with the Office of the Solicitor, was consulted in reaching this decision.

For your information, Congress excluded three discrete categories of law enforcement and national security records from the requirements of FOIA. See [5 U.S.C. 552\(c\)](#). This response is limited to those records that are subject to the requirements of FOIA. This is a standard notification that is given to all our requesters and should not be taken as an indication that excluded records do, or do not, exist.

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If you have any questions about our response to your request, you may contact me by email at mwr_foia@nps.gov.

Sincerely,

 Digitally signed by HELEN
SMITH
Date: 2023.07.21
08:40:53 -05'00'

Helen Smith
Regional FOIA Officer
National Park Service, Interior Regions 3,4,5

Gateway Arch
Transportation Facilities



**Management, Operation,
Maintenance, and Physical Condition**

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PART I

REVIEW OF MANAGEMENT AND OPERATIONS

I REVIEW OF MANAGEMENT AND OPERATIONS

A. SUMMARY

Part I discusses (1) the documents that control the management, operation, and maintenance of the transportation facilities, (2) the organization of the various agencies involved in the operation (3) the operation of the facilities, (4) the patronage, (5) the operating and non-operating revenues and expenses, and (6) the provision of insurance.

The discussions, comments, and conclusions are based upon observing the facilities in operation, interviewing Bi-State and NPS personnel, and studying current records.

The management and operation of the transportation facilities were found to be good and in substantial compliance with the Bond Resolution. The two year old reservation system has been a major improvement for the convenience and comfort of the visitors. Operating personnel are available at all stages of the visitors' trip to assure their safety and enjoyment of the Arch. Daily reports are prepared on patronage, train trips, ticket sales, operating conditions, and any unusual occurrences. These reports and frequent inspections provide Bi-State with necessary management information to maintain control of the operation.

Patronages has leveled-off in recent years. It appears that the facility is operating at its practical capacity during most of the peak season. Unless people substantially change their vacation habits and visit the Arch more frequently during off-season periods, no patronage growth is anticipated.

The fare structure has never been changed since the Arch opened. This fact, coupled with a no-growth patronage situation, has resulted in an almost constant annual revenue, while expenses have been increasing annually, primarily because of inflation. After 1984 it is expected that operating expenses will exceed revenues if the fare is not increased.

Bi-State maintains the accounts and manages the finances in accordance with the Bond Resolution. Insurance is also provided in compliance therewith except the loss of revenue insurance is less than that stipulated in the Resolution.

In summary, with the noted exception, it has been found that the operation and management of the Arch transportation facilities are being done by Bi-State substantially in accordance with the Bond Resolution.

B. BACKGROUND

In 1962 the Bi-State Development Agency (Bi-State) entered into a Cooperative Agreement with the National Park Services (NPS). The Agreement stipulates that Bi-State would provide \$3,300,000 for the design and construction of the transportation facilities in the Arch, the 630-foot high monument of the Jefferson National Expansion Memorial. These funds were to be provided (and were) through the sale of revenue bonds, which Bi-State authorized in a Bond Resolution adopted in July, 1962. The Cooperative Agreement was made a part of the Bond Resolution. These two documents prescribe the responsibilities and obligations of Bi-State and NPS, and the financial arrangements to be followed in operating the facilities and paying the debt service.

The Cooperative Agreement provides that Bi-State will finance the transportation facilities, which consist of two trains, two elevators, two sets of stairways, and the necessary control, power, and communication equipment. These items are more fully described in the inspection portion of this report. The Federal Government owns these facilities subject to the indebtedness provisions in the Bond Resolution.

In other provisions of the Cooperative Agreement, NPS agreed to maintain the facilities; however, Bi-State agreed to assist in funding maintenance as an operating cost should NPS have difficulty in obtaining adequate funds. In addition, NPS would cooperate with Bi-State in the operation of the facilities by providing space for operation personnel and storage. Bi-State agreed to operate the facilities, establish the user fees, collect the fees, and disburse this revenue in accordance with this agreement and the Bond Resolution. Bi-State also assumed responsibility for maintaining accounts and records, and providing adequate property and liability insurance. The terms of this agreement remain in effect until all bonds are retired or 30 years elapse, whichever ever occurs last. NPS can terminate the agreement upon payment of costs to Bi-State to call all bonds.

The Bond Resolution specifies that all costs incurred by Bi-State in the operation of the facility and the servicing and retirement of the bonds shall be paid solely from facility income. It also prescribes a detailed plan for the management of the revenues received from the facilities' operation. Figure 1 - "Financial Management System," on the next page, describes the basic provisions of this plan. The priority of payments are: (1) operating expenses, (2) interest payments, (3) bond redemption, (4) renewal and replacements, and (5) capital

improvements. It should be noted in this last category that improvements are allowed not only for the transportation facilities, but also for the Memorial, subject to the approval of both Bi-State and NPS.

C. ORGANIZATION

Bi-State is governed by a Board of Commissioners created and empowered by an interstate compact. Its powers include operating transportation facilities and issuing revenue bonds. Bi-State's organization in 1980 consists of three divisions, namely Corporate, Transit, and Development, each of which is headed by a general manager who reports to the executive director. The operation of the Arch transportation facilities comes under the Development Division.

The Development Division's General Manager is John D. Booth. There are four departments in this division, namely Parks Airport, Solid Waste Project, Port Development, and the Arch. Each department is headed by a manager. John D. Kuziel is the manager of the Arch facilities. This department also includes a clerk and an accountant.

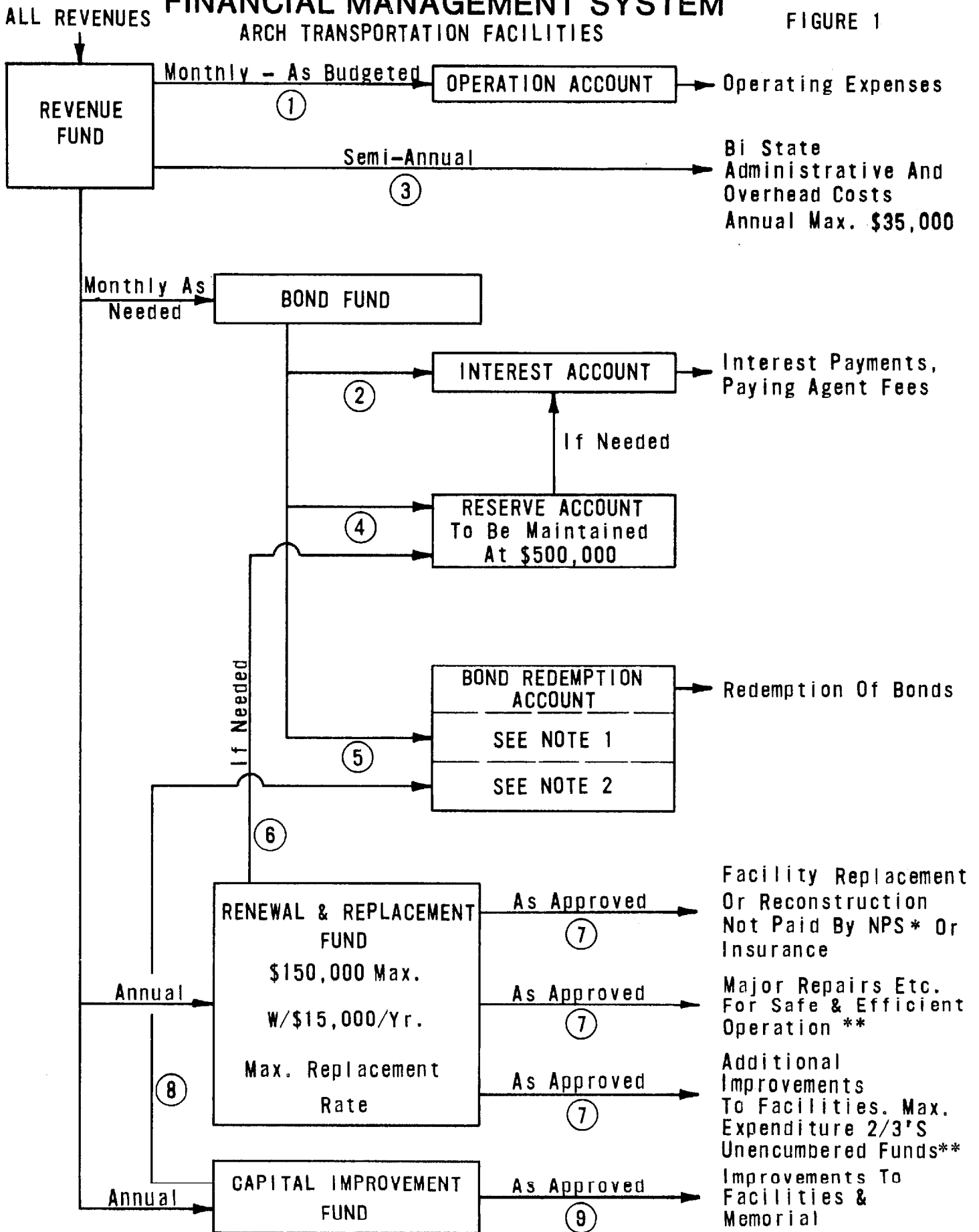
The NPS organization at the Jefferson National Expansion Memorial is headed by a superintendent. Under him and his assistant are divisions that include the Division of Maintenance headed by Mr. Robert Kelly. This division is divided into three sections, namely Grounds, Buildings, and the Arch Transportation facilities. Mr. Harry Brietenstein is the foreman in charge of the latter section. His functions are described in the inspection portion of this report.

The St. Louis Usher Service, Inc. (Usher Service) is responsible for the daily operation of the Arch trains under contract with Bi-State. This company, which also provides service for events at Busch

FINANCIAL MANAGEMENT SYSTEM

ARCH TRANSPORTATION FACILITIES

FIGURE 1



NOTES FOR FIGURE 1

Note 1: Annual deposit from Revenue Fund into Bond Redemption Account to be equal to \$250,000 less annual deposit into Interest Account.

Note 2: Annual transfer from Capital Improvement Fund (CIF) to Bond Redemption Account (BRA) based on following formulas:

WHEN: Reserve Account (RA) + BRA \lt \$825,000

THEN: Transfer \cong 0.50 CIF Annual Deposit

WHEN: RA + BRA \cong \$825,000

THEN: Transfer \cong 0.25 CIF Annual Deposit

② - Number Indicates Priority of Payment

* NPS - National Park Service

** Subject to Engineer's Approval

Stadium, provides the personnel necessary to collect tickets, make reservations, direct the public, and operate the trains. The current contract became effective on February 27, 1977 for a two-year period with an option to renew for an additional two years subject to a renegotiation of the pay schedule. This option was exercised; the contract will now expire in February, 1981.

Usher Service provides three categories of personnel, namely supervisor, ticket collector, and dispatcher. Job description sheets have been prepared for each job by Bi-State. Usher Service trains and qualifies the personnel and provides their uniforms, which are subject to Bi-State's approval. Bi-State has the right to refuse the services of any personnel, who in its discretion are not able, for any reason, to perform their duties. Usher Service provides workman's compensation, employees insurance, a fidelity bond on all of its employees, and liability insurance.

Finally, Security Amoured Car Services, Inc., under contract with Bi-State, provides the security necessary for the storage and delivery of tickets, and the collection and depositing of the daily ticket sale revenues.

In summary, the transportation facilities of the Arch are managed, maintained, and operated by Bi-State and NPS under the provisions of a Cooperative Agreement approved on May 14, 1962 and the Bi-State Bond Resolution adopted on July 6, 1962. Bi-State has contracted the operation of the facilities to St. Louis Usher Services, Inc.

Additional money and ticket handling services are provided under a Bi-State contract by Security Amoured Car Services, Inc.

D. OPERATIONS

A. Schedule & Staffing

During the year the Arch trains operate within two schedules, one for winter, the other for summer. The summer schedule applies from Memorial Day weekend in May until Labor Day in September. The schedules and the operating staff required is shown below.

WINTER SCHEDULE

9:30 a.m. to 5:30 p.m. (one shift)

WEEKDAYS - ONE TRAIN IN OPERATION

- 1 - Supervisor
- 1 - Ticket Seller
- 1 - Reservation Clerk
- 5 - Dispatchers
- 2 - Relief Dispatchers
- 1 - Information Guide

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WEEKENDS - TWO TRAINS IN OPERATION

- 1 - Supervisor
- 1 - Ticket Seller
- 2 - Reservation Clerks
- 10 - Dispatchers
- 3 - Relief Dispatchers
- 1 - Information Guide

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SUMMER SCHEDULE

8:30 a.m. to 9:30 p.m. (two shifts)*

DAILY - TWO TRAINS IN OPERATION

1 - Supervisor

1 - Ticket Seller

2 - Reservation Clerks

10 - Dispatchers

3 - Relief Dispatcher

1 - Information Guide

18

* The day shift is from 8:15 a.m. to 4:15 p.m. The evening shift is from 4:00 p.m. to 10:00 p.m.

The train facility functions in the following manner. The Arch visitors wishing to use the train first proceed to the ticket window to purchase tickets. They may be assisted by the information guide who is available on the main floor to keep the ticket line in order and provide needed assistance. Upon purchasing the ticket, or tickets, from the ticket seller, the reservation clerk, who sits next to the ticket seller, gives them a reservation for a specified number of seats on a designated train at a specific time. There is a reservation clerk for the north train and the south train respectively.

At each ramp entrance leading to the boarding area there is a sign showing the number and time of the next departing train. When the train, for which reservations have been given, is announced the visitors

proceed to the ramp entrance and present the reservations to an attendant (dispatcher) who verifies it and permits them to proceed to the boarding area where two dispatchers assist in distributing visitors to line up in the waiting area in groups of five, each behind a gate that leads directly to a capsule platform door. There are eight capsules and therefore eight gates.

When the train is ready, the visitors pass through the gates and board the train. A dispatcher activates the system which closes the doors and starts the train on its four minute trip to the top of the Arch. At the top there are also two dispatchers for the train in each leg.

Because of the steep angle of the train at the top station, there is a stepped platform area. Each capsule aligns with a separate level that is connected to the next level and ultimately to the observation room by a series of steps. Because of the close quarters at the top it is necessary to separate the movement of boarding and arriving visitors by dividing the steps in half by means of color-coding. The steps also serve as the waiting area for departing visitors.

At the top the visitors are free to spend as much time as they desire. In addition to the dispatchers, a NPS person is also on duty to provide information and visitor assistance. When the visitors are ready to leave, they may take a train in either leg of the Arch. Under the supervision of the dispatchers, they proceed to the waiting area previously described and wait for the train. After the trip to the bottom, they leave by means of the exit passageway to the main floor.

At all times during the visitor's trip, including the purchasing of tickets, but with the exception of the elapsed time between purchasing the ticket and entering the ramp to the boarding area, a staff person is present to supervise and be of assistance when needed.

Advance reservations may also be made. This service allows groups to purchase tickets in advance and receive reservations for a specific time and date. As a matter of policy, Bi-State will make advanced reservations for no more seats than the equivalent of two trains per hour, i.e. 80 seats per hour.

The handling of tickets and money is the responsibility of the Usher Service. The security and delivery of the tickets is contracted by Bi-State to Security Armoured Car Services (Security). Usher Service is assigned tickets as needed and is accountable for them. The money received from ticket sales is collected and deposited daily by Security. Usher Service submits a daily report on tickets sold. Separate reports are submitted for the number of adult and child tickets sold for each train. These reports are signed by both the ticket seller and the supervisor.

There is also a Daily Supervisor Report and a Daily Dispatcher Report (one for each leg). The latter report records hourly the number of trips made and the turnstile readings. The Supervisors Report includes this information plus general conditions and comments. On a two-shift day both supervisors sign the report.

The Bi-State Arch manager reportedly makes frequent (normally daily) inspections of the Arch train operation to make certain that Usher Service is in compliance with all contract provisions concerning staffing, staff behavior, and appearance.

The fare is \$1.00 for adults and \$.50 for children 12 years of age and under. There is also a fare of \$0.25 each for groups of children visiting the Arch as part of an educational tour. This fare structure was set in 1962 and went into effect in 1967. In terms of 1967 dollars the adult fare and child's fare in April, 1980, was \$0.40 and \$0.21, respectively. Conversely, if the real value of the fares had been maintained since 1967 the April fares would have been \$2.43 and \$1.22. Due to inflation there has been a substantial effective reduction in real fare over the past 13 years.

E. PATRONAGE

The patronage trend since the Arch train began operation in 1967 is shown in Figure 2, "Arch Train, Ridership Trend, 1968-1980". The most distinctive facet of the curve is its almost level configuration. Since FY 1969, the annual patronage has only varied from a low of 740,000 (FY 71) to a high of 922,000 (FY 80), a difference of 182,000 riders, or 25 percent of the FY 71 figure. Since FY 76 there has been practically no growth. The mild 1979-80 winter appears to have influenced an increase in winter ridership, but Bi-State anticipates a decrease for FY 81.

The lack of growth can be attributed primarily to the fact that, on the average, the trains are operating at almost 80 percent capacity during most of the busy season. July is the busiest month of the year. On a typical July weekday, the north leg train is operating above 90 percent capacity from 10:00 a.m. to 6:00 p.m. The same is true for the south leg train from 11:00 a.m. to 6:00 p.m. On weekends, they

are both over 90% capacity from 10:00 a.m. (north leg) and 11:00 a.m. (south leg) to 9:00 p.m. In July, the daily weekday patronage is almost 5,000, while the daily weekend patronage is between 5,600-5,700. The daily average for July, 1980 is 5,022. The same figure for July, 1979 is 5,360.

During peak periods, each train makes six trips per hour. Since the train capacity is 40 seats, each train can carry 240 persons per hour for a total system capacity of 480 persons per hour. For the 13 hour operating period the maximum capacity is 6,240 persons. This means that on a July weekend, the system is up to 90 percent total capacity, which very well may be considered a practical capacity.

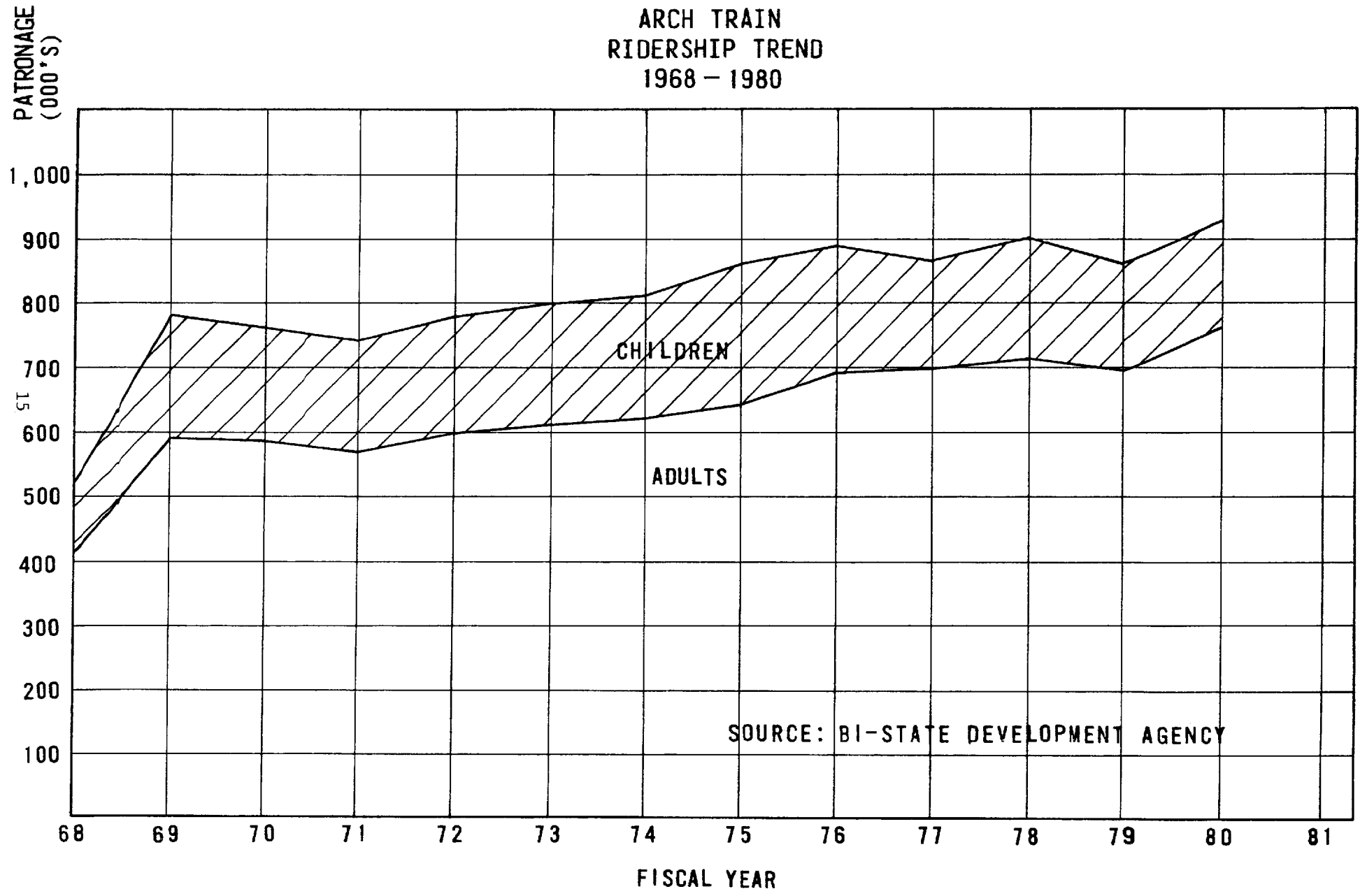
August is the second busiest month and is six percent lower than July. June is the third busiest month, although June 1980 was almost as busy as August 1979. The slowest month is January, which averaged 890 persons per day in 1980. February and December are the next slowest months in that order.

F. REVENUE (Operating and Non-Operating)

The pre-audited operating revenue from ticket sales for FY 1980 is \$842,000. Non-operating revenue from interest on investments is \$144.646 for the same period.

The trend in operating revenue on a yearly basis is shown on Figure 3, "Arch Train - Revenue and Expenses, 1975-1985." The projections have been made by Bi-State. As can be expected, with a fixed fare schedule and patronage showing no growth, there has been no increase in revenue over the past years. In fact, allowing for inflation, there has been a real decrease in the operating revenues.

FIGURE 2
ARCH TRAIN
RIDERSHIP TREND
1968 - 1980



FY 1980 was a good year for short term investments. Investments (non-operating income) provided \$142,396 or over \$90,000 more than expected in the budget. Recognizing that this was somewhat unique Bi-State anticipates approximately \$110,000 in the FY 81 budget.

G. EXPENSES

The organization of this section follows the outline of Figure 1, "Financial Management System". This includes those expenses necessary to operate the transportation facilities, service the bonds, and make improvements.

Operating Expenses: Operating expenses have been divided into an Operations and an Administrative and General category. Generally, the former category covers services and goods purchased from others, while the latter covers services and goods provided by Bi-State. These expenses are all shown on Table 1, "Operating Expenses, Fiscal Year 1980."

The largest expense is the cost of the supervisors, ticket sellers, and dispatchers (line items 1, 2 & 6) provided by Usher Service. The total of these items, \$193,638, is the total compensation to Usher Service and comprises 36 percent of the operating expenses.

The next largest expense involves repairs and maintenance provided by the National Park Service (NPS). This includes the salaries for four NPS mechanics and the cost of parts and repairs (line items 3 & 4). This amounts to \$123,559 or 23 percent of the operating expenses. Electrical power, comprising 12 percent of the operating expenses, is the third largest expense.

FIGURE 3
ARCH TRAIN
REVENUE AND EXPENSE
1975 - 1985

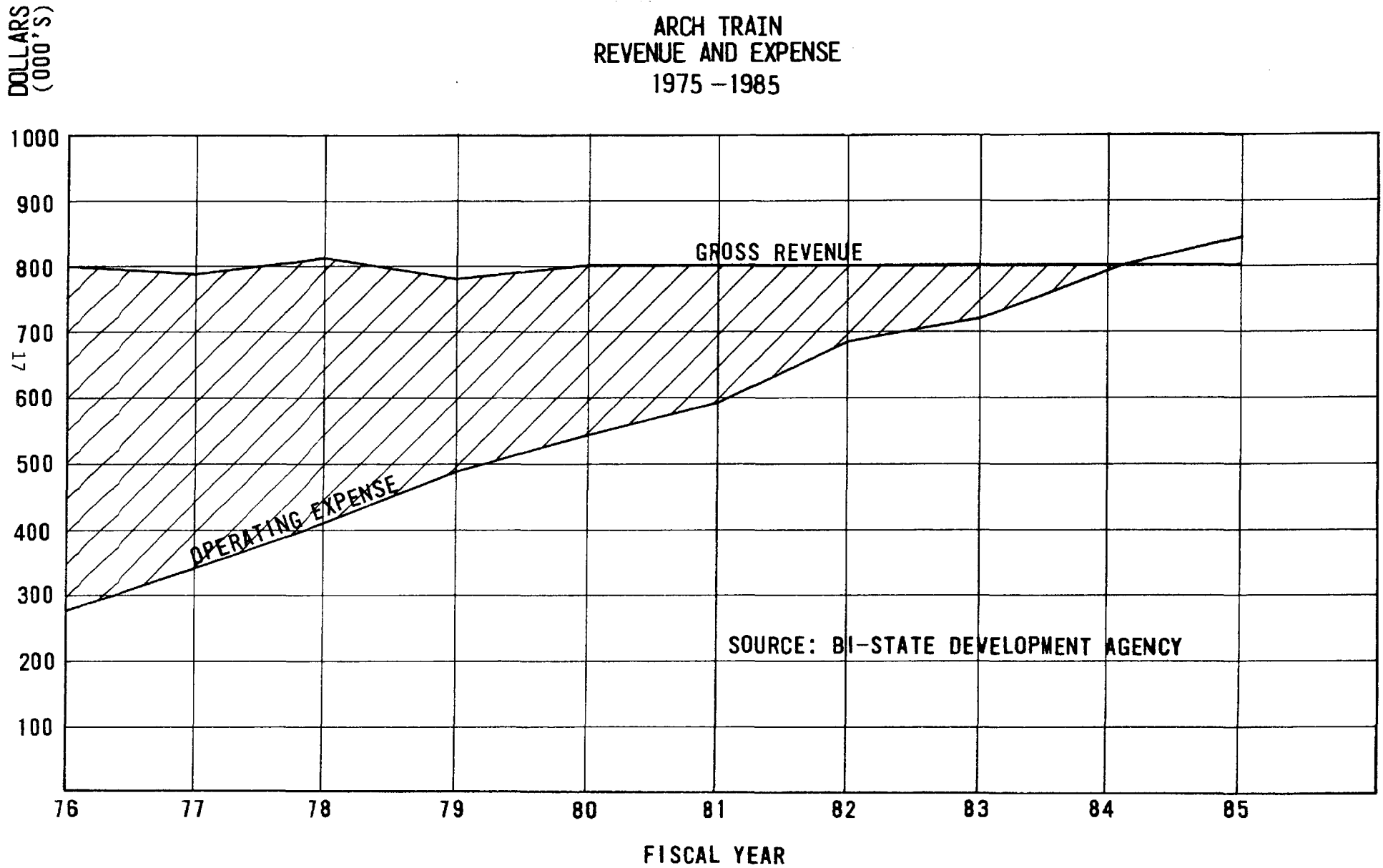


TABLE 1

OPERATING EXPENSES
FISCAL YEAR 1980
(Unaudited)

Operations	Actual		Budget	Variance Over (Under)
	Amt.	% of Total		
1. Supervisors	19,913	4	19,301	612
2. Dispatchers	156,318	29	165,917	(9,599)
3. Repairs & Maint. Transporters	20,573	4	40,000	(19,427)
4. Standby Mechanics	102,986	19	100,000	2,986
5. Power Cost	64,271	12	56,400	7,871
6. Ticket Sellers	17,407	3	17,429	(22)
7. Ticket Equipment	720	--	396	324
8. Advertising & Promotion	9,411	2	8,508	903
9. Consultants	6,377	1	3,985	2,392
10. Rental Equipment	--	--	840	(840)
11. Money Collection and Ticket Storage	1,806	--	3,864	(2,058)
12. Tickets	5,651	1	5,360	291
13. Others	276	--	1,260	(984)
Subtotal	405,709	75	423,260	(17,551)
<u>Administrative & General</u>				
14. Salaries	46,915	9	46,955	(40)
15. F.I.C.A. Taxes	2,742	1	2,794	(52)
16. Unemployment Taxes	--	1	53	(53)
17. Pension Costs	6,103	--	4,730	1,373
18. Group Insurance	1,982	7	1,431	551
19. Administrative Fee	35,000	1	35,000	--
20. Professional Servs.	7,824	--	2,000	5,824
21. Registrar and Paying Agent Fee	1,527	--	2,400	(873)
22. Rent and Electricity	485	--	505	(20)
23. Telephone	26,624	5	400	(16)
24. Insurance	1,704	--	25,485	1,139
25. Travel Expenses	306	--	3,200	306
26. Printing and Office Supplies	--	--	300	(300)
Subtotal	131,596	25	125,253	6,343
Total	\$537,305	100	\$548,513	(11,208)

Source: Bi-State Development Agency

The Administrative and General costs include the salaries and benefits for the Bi-State manager, a clerk, and an accountant. The Administrative Fee of \$35,000 is the maximum allowed under the Bond Resolution for overhead and services provided by Bi-State management.

The trend of operating expenses is upward, as shown on Figure 3. At the rate of increase since 1976 operating expenses will equal revenues by 1984, and exceed revenues after that year, given the current fare structure.

Bi-State operated within its budget during FY 1980. The major line item overruns were power costs (line item 5) and Professional Services (line item 20). The rise in electrical rates beyond that projected accounts for the first item, and a garage revenue study for the proposed Memorial parking garage caused the overrun in the latter case.

The major under expenditure is in Repairs and Maintenance - Transportors (line item 3). This item is budgeted based on an annual request from NPS. NPS estimates what it may need in replacement parts and repairs during the forthcoming year. As the needs arise during the year NPS submits purchase order requests to the Bi-State Arch Manager. With his approval, Bi-State then makes the purchase for NPS. The budgeted amount serves, in effect, as a line of credit upon which NPS can draw for needed repair work. In recent years, NPS has requested \$40,000 but has not utilized all of it.

Non-Operating Expense: Non-operating expense is primarily for the payment of interest and bond redemption. All funds not utilized for the operation of the system are earmarked for bond service. The following comments follow the outline on Figure 1.

Interest expenses were \$38,170 in FY 1980 and met all bond interest payments.

The Reserve account is at \$500,000 as required by the Bond Resolution.

Bond redemptions in FY 1980 amounted to \$182,000. The account balance as of June 10, 1980 is \$256,530.

The Renewal and Replacement Fund is at its maximum amount of \$150,000. This fund reached this amount with a \$15,000 payment in FY 1979. No expenditures have ever been made from this fund. The major recurring replacement expenditure at the Arch has been the bi-annual replacement of the hoist and guide cables. Although this is a legitimate expenditure from this fund, the NPS has been paying this cost out of its own budget. The last cable replacement was during FY 1979 and cost \$30,000.

The Capital Improvement Fund had a balance of \$378,246 as of June 30, 1978. Expenditures during FY 1980 were \$6,981 for office equipment and a vehicle for Bi-State Arch management use. Bi-State reports that transfers from this fund to the Bond Redemption account are made in accordance with the formula specified in the Bond Resolution. (See Figure 1, Note 2).

All of the funds and accounts required by the Bond Resolution have been formed and are being operated in compliance with the guidelines.

There is an annual published audit of the Arch transportation as part of the audit of all of Bi-State's funds. The firm of Coopers & Lybrand prepared the audit for FY 1979. Price, Waterhouse & Company are

responsible for the FY 1980 audit. The change in firms was due to Price, Waterhouse submitting a lower bid to do the job. Both are reputable Certified Public Accounting firms.

H. INSURANCE

Under the Bond Resolution, Bi-State is to provide physical property, liability, and loss of revenue insurance.

Physical property insurance is provided by a Boiler and Machinery policy that has a limitation of \$500,000 per each occurrence. This covers all of the electrical and mechanical equipment excluding the transporters, which are covered under another policy.

Liability insurance is provided by a \$1,000,000 primary insurance policy plus \$50,000,000 excess insurance provided under two \$25,000,000 umbrella/excess policies that protect all of Bi-State's operations, including the Arch transportation facilities. In addition, the St. Louis Usher Service, Inc. has a \$1,000,000 liability policy that also protects Bi-State.

Loss of revenue insurance is provided through a Business Interruption policy, which has a \$388,000 limit, with a \$1,000 deductible. The Bond Resolution specifies that the amount of insurance should be "...in an amount approved by the Engineer, but not less than \$500,000."

I. CONCLUSIONS

The management of the operation of the Arch transportation facilities is handled by a Bi-State staff of three persons. This staff, consisting of a manager, accountant, and clerk, supervises the facilities

operation, promotes the Arch, maintains the required accounts and records, and performs other administrative duties. It is also supported by other Bi-State administrative personnel. The staff size is considered reasonable for the work to be done. Based upon interviews and the review of records necessary to prepare this report, it is felt that the staff is doing a good job.

The St. Louis Usher Service (Usher Service) Company, under contract to Bi-State, provides the trained personnel to operate the facilities. The operation of the trains, including ticket selling and control of the visitors, is handled well. There is adequate staff at all times to make the visitors' trip as convenient and enjoyable as possible. Bi-State maintains a frequent check on the operating personnel. Their appearance and behavior, when observed during this report preparation period, was good. The reservation system, placed in operating two years ago, is a major improvement over the former system when everyone had to wait in line, not only to buy tickets, but also to board the trains.

The control of tickets and money is properly handled by qualified and bonded personnel. The Security Armoured Car Service Company is responsible for the storage and delivery of tickets, and the collection and deposit of the fare revenues each day.

Bi-State operated during FY 1980 within its budget. All operating costs were financed by operating revenues. There were also sufficient funds to make all necessary bond service payments.

In July, the busiest month, the Arch transportation facilities are operating at over 90 percent capacity during late mornings, afternoons, and early evenings. Any substantial increase in patronage would

have to come from a change in visitors behavior as to the time and season they would want to visit the facility. Since such change is unlikely, it may be assumed that the facilities are now carrying about as many people as they ever will carry.

The fares of \$1.00 adult and \$0.50 child, are quite reasonable. Since 1967, when the trains first operated, the fares in terms of 1967 dollars has declined from \$1.00 and \$0.50 to \$0.41 and \$0.21. Conversely, if the real value of the fare had been maintained since 1967, the April, 1980 fares would have been \$2.43 and \$1.22. This shows the impact of inflation.

Operating expenses have been increasing due to inflationary pressures, as shown in Figure 3.

To date, there has been adequate revenue to cover all operating and bond service expenses, besides having funds available for improvements to the Memorial. However, the no-growth patronage situation and the fixed fares have resulted in no revenue growth in recent years. By 1984 it is projected that operating revenues will just meet operating expenses, with deficits occurring in subsequent years. It will be necessary to raise the fares in order to maintain the good level of service presently being provided and to service the remaining bonds.

The auditor's reports and Bi-State statements indicate that all required accounts are being maintained in accordance with the Bond Resolution. Funds in reserve accounts, or those not immediately needed have been invested as permitted by law. The funds are audited annually by a Certified Public Accountant.

Bi-State maintains insurance as required by the Bond Resolution with one exception. The Bond Resolution specifies that loss of revenue insurance be a minimum of \$500,000. The current business interruption policy coverage is only \$388,000.

In summary, with the noted exception, it has been found that the operation and management of the Arch transportation facilities are being done by Bi-State substantially in accordance with the Bond Resolution.

work platform to the top of the Arch to observe any unusual conditions or sounds. At the upper station, the men again exercise each door and observe the mechanism while it is operating. When they are satisfied with the train operations, they again ride the work platform to the lower station to observe the equipment during the trip. When they have checked the function and safety of the capsules, doors, controls, intercom, drive and train travel, the train is put into service.

h. From our interviews with the staff and foreman we learned that during the annual inspection made on each train, it is taken out of service for several weeks and the complete system, including all mechanical, structural and electrical components, is thoroughly cleaned, inspected, and lubricated. Tightness of all bolts on all equipment, tracks, and attachments of equipment and tracks to supporting structure is checked. Most of the moving parts are disassembled and inspected for wear or misalignment. In short, the entire system is gone over with a "fine tooth comb" inspecting for wear, impending failures, imperfections, cracks or deficiencies of any kind. The instructions for the staff at this time are to clean and check everything.

i. Because of their many years experience in maintaining the Arch trains based on a Planet Corporation prepared Outline of Inspection and Servicing Procedure (as modified by NPS experience), it is obvious that no one knows more about this equipment than the NPS maintenance staff. There is ample evidence that the staff has done an excellent job maintaining, servicing and repairing the equipment, but the documentation of the inspection and maintenance program is not as thorough or well organized as it should be. In the absence of Mr. Breitenstein, NPS personnel would probably not be able to produce copies of appropriate records

showing what significant tasks were performed, by whom, and when. The staff would probably have to rely on memory. Some historical data and records are available but are not well organized or readily retrievable. At one time in the past, weekly, monthly, quarterly and annual check-off lists were prepared based on the Outline of Inspection and Servicing Procedure, but these lists are not currently being used because it is believed by the staff that the lists were more of a hindrance than a help in maintaining the equipment. We were shown a copy of a daily and annual check list that is now being used, but the staff believes that these new lists are not very useful because they do not cover everything that is done at those times. However, we believe that sufficient benefits would accrue to warrant institution of a formal program of regular maintenance, inspection and documentation of work performed. The resulting work history would be used for future maintenance and inspection decisions. The Outline of Inspection and Servicing Procedure should be updated based on NPS maintenance experience. New daily, weekly, monthly, quarterly and annual check lists should be developed based on the updated maintenance procedure. These check lists need not list everything done at a particular time. Items listed on the daily list need not be repeated on the weekly list and those listed on the weekly list need not be repeated on the monthly list, etc. The purpose of the lists would be twofold: to provide a standardized, ready means of documenting the significant tasks performed, and to help remind the staff of necessary tasks that are done infrequently, such as during the monthly and quarterly inspections which do not require the complete inspection and service performed during the annual inspection.

D. POSSIBLE NEAR-FUTURE REPLACEMENT COSTS

In this section we identify the major equipment items that may require replacement, and estimate the probable remaining useful life and the likely replacement costs in 1980 dollars. In the past, NPS practice has been to promptly replace or repair all parts displaying signs of damage or excessive wear during any inspection. Mr. Kelly reported that Bi-State has been making annual appropriations in recent years for such parts-replacement amounting to \$25,000 during some years and \$40,000 during others. As a result of Bi-State's practice of making funds available and the excellent maintenance by NPS, the equipment is presently in excellent condition and the facility has had an enviable performance record. However, as the equipment continues to age it is a certainty that the Renewal and Replacement Fund will be called upon to finance replacement of some major equipment items.

We have listed the major equipment items of the Arch trains in a table below and have estimated conservatively the remaining useful life for each item. These are order-of-magnitude estimates because of the one-of-a-kind equipment such as the Arch trains and the visual nature of our inspection. Most of these components can be expected to give indications during normal maintenance of an impending need for replacement. As long as the annual inspection continues to be as thorough as it has been in the past, damage and wear of those components should be evident in ample time to permit replacement during a scheduled shut-down in the off-peak season. We do not anticipate that many of these components would require replacement during any one year, or even

that the same component would necessarily require replacement on each of the trains at the same time.

We have not attempted to develop cost estimates for all of these major equipment items listed in the table because some of the items will not require replacement until many years from now, well beyond the 10-year period considered in this report. Instead, the table shows order-of-magnitude costs, appropriate to this type of inspection and report, only for those items that might possibly require replacement within the next 15 years.

The 15-year period is used because one or more of these components could require premature replacement during the 10-year period considered in this report, in which case having a cost estimate available would be useful, and because the table indicates that several high cost components may require replacement shortly after the 10-year period being considered. In the latter case the estimate for those replacements indicates a need to increase the Renewal and Replacement Fund.

After reviewing the probable life remaining and the probable installed replacement costs columns in the table, we think the present \$150,000 Renewal and Replacement Fund should be increased at the rate of \$30,000 per year to a total of \$300,000 and should be renewed at the same \$30,000 per year rate whenever it has been depleted to replace major components during the next 10 years. If inflation continues at its present rate, consideration should be given in about five years to further increasing this fund and its renewal rate.