

**U.S. Department of Transportation  
Federal Railroad Administration**

**FULLY ALLOCATED COST OF  
RAIL PASSENGER SERVICE  
BETWEEN NEW YORK AND  
WASHINGTON**

**Phase II**

**Metroliner and Conventional  
Passenger Trains During 1970**

**Peat, Marwick, Mitchell & Co.**





Commissioned By

Demonstration Division  
Office of High Speed Ground Transportation  
Federal Railroad Administration  
U. S. Department of Transportation



PEAT, MARWICK, MITCHELL & CO.

CERTIFIED PUBLIC ACCOUNTANTS

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July 30, 1971

Mr. M. Clifford Gannett, Assistant Chief  
Demonstration Division  
U. S. Department of Transportation  
Federal Railroad Administration  
Office of High Speed Ground Transportation  
Washington, D.C. 20591

Dear Mr. Gannett:

We have completed Phase II of our study for the U. S. Department of Transportation (DOT), Federal Railroad Administration (Contract No. DOT-FR-00025, dated January 9, 1970), to determine the fully allocated cost of Metroliner and specified conventional rail passenger service operated between New York, N.Y. and Washington, D.C. during 1970. This report was preceded by our report of December 16, 1970, in which we developed the fully allocated cost of specified conventional trains operating between New York, N.Y. and Washington, D.C. in 1968; it will be followed by a report projecting the fully allocated cost if only Metroliner equipment had been used to provide passenger service between New York, N.Y. and Washington, D. C., 1970.

OBJECTIVES OF  
OUR STUDY

The objective of Phase II of the study was to determine the fully allocated cost of operating 51 conventional and 14 Metroliner trains between New York, N.Y. and Washington, D.C. during 1970. While completing Phase I of the study, we realized that satisfactory techniques were not available to analyze certain types of operating expenses. Consequently, the current study

(Phase II) was expanded to include the development of techniques to analyze (1) the costs of passenger stations, (2) the costs incurred at the Wilmington Heavy Repair Shops where the Metroliner cars are repaired and maintained and (3) the capitalized Maintenance of Way and Structures Costs incurred to upgrade catenary, roadbed and track for the higher speed Metroliner operations.

As in the Phase I portion of the study, we reviewed the techniques we used with Penn Central Transportation Company (PC) officials and obtained their concurrence in these techniques prior to submitting this report.

#### HOW WE CONDUCTED THE STUDY

Techniques to equitably allocate passenger station costs, the cost incurred at the Wilmington Heavy Repair Shops, and the capitalized track improvement costs were first developed. These techniques were applied to the appropriate PC costs and combined with other costs routinely accumulated in PC's accounting systems.

As in Phase I of this study, PC's responsibility reports were the principal source of expense data. PC's Form-A Report to the Interstate Commerce Commission (I.C.C.) was the source of equipment maintenance costs for the conventional trains and system overhead costs. We also developed certain estimates through valid statistical samples, reviewed PC operating records, interviewed PC officials, and observed actual operations. Independent professional engineers, familiar with PC's Maintenance of Way and Structures costs, were also consulted.

The cost data developed, the data sources used, and the techniques employed to allocate the various costs were discussed with PC accounting officials and their comments were incorporated in the development of our allocations and in the preparation of this report.



Due to the more sophisticated allocation techniques developed and used in this study certain of the costs developed here are not comparable to those developed in Phase I of this study.

SUMMARY OF  
ALLOCATIONS

Our findings and the techniques we used are discussed in detail in the various sections of this report. A summary of the allocations by cost category is presented below. These costs include all appropriate overhead allocations.

	Studied Conventional <u>Service</u>	Metroliner <u>Service</u>
Stations	\$ 3,193,615	2,149,651
Joint Facilities	1,960,294	808,038
Transportation	10,962,779	2,752,735
Maintenance of Equipment	8,043,161	6,613,041
Maintenance of Way and Structures	3,578,324	3,452,093
Taxes	<u>359,980</u>	<u>72,078</u>
Fully allocated cost of operating studied service 1970	<u>\$ 28,098,153</u>	<u>15,847,636</u>

ASSISTANCE  
RECEIVED

Officials and employees at PC were extremely helpful to us. They provided invaluable assistance in obtaining cost data and operating statistics. Their comments were also helpful to us in analyzing specific PC operations and in equitably allocating the costs of these operations. As in the Phase I portion of the study, Mr. S. Hastings and his staff were of especial assistance to us.

\* \* \* \* \*



We appreciate the opportunity of working for the Department of Transportation on this study and are looking forward to its successful completion.

Yours truly,

*Peat, Marwick, Mitchell & Co.*



FULLY ALLOCATED COST OF RAIL PASSENGER SERVICE  
BETWEEN NEW YORK AND WASHINGTON

Phase II: Conventional Trains and Metroliners - 1970

U. S. Department of Transportation

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I - INTRODUCTION

This report presents the results of Peat, Marwick, Mitchell & Co.'s (PMM&Co.) Phase II study and three special studies performed under contract No. DOT-FR-00025 with the United States Department of Transportation to determine the fully allocated costs of specified passenger train services offered by the Penn Central Transportation Company between New York, N. Y. and Washington, D. C.

SCOPE

The study was conducted in three phases:

Phase I - Determine the fully allocated cost during 1968 of the operation of 46 Penn Central (PC) trains which were selected by DOT.

Phase II - Determine the fully allocated cost of the coach and parlor car service on 51 conventional passenger trains and 14 Metroliners operating between New York and Washington in 1970. The studied conventional trains are listed in Exhibit I-1.1 and the Metroliners are listed in Exhibit I-1.2.

Phase III - Project the fully allocated cost that would have resulted if Metroliner equipment were used in place of conventional equipment on all of the studied trains in 1970.

During the Phase I portion of this study it became apparent that no suitable allocation techniques were available to analyze certain types of operating costs. Consequently our contract was modified to allow us to develop suitable allocation techniques which would be used for passenger station costs, the costs of Metroliner repairs, and the capital costs incurred in upgrading track and roadbed for Metroliner operations. These special studies would be performed prior to conducting the Phase II portion of this study, and the



allocation techniques developed would be used in the Phase II and Phase III studies.

The Phase I study was completed and our report was submitted in December 1970. This report presents the results of the Phase II study and the three special studies: the 30th Street Station Study, the Wilmington Heavy Repair Shop Study, and the Capitalized Track and Roadbed Improvement Study. The Phase III study will be completed and submitted at a later date.

Throughout this study the fully allocated cost of the studied services was interpreted to include: (1) the direct costs of operating the studied services, (2) a portion of the indirect costs applicable to these services, and (3) an equitable allocation of overhead and administrative expenses.

The services studied were the parlor car and coach service offered on the trains listed in Exhibit I-1.1. Food service costs, Pullman costs and the costs of mail and baggage service were to be excluded. Certain cars on the studied trains were transferred to other railroads and had a final destination south of Washington. The costs attributable to the operation of these cars were also to be excluded from this study.

#### DATA SOURCES UTILIZED

As in Phase I of our study, the primary source of expense data was the third level reports of PC's Responsibility Reporting System. This system, designed primarily for management budgetary control, has the objective of assigning controllable expenses to specific responsibility centers. The term "management center" was used by PC in place of "responsibility center" after December 1970.

The direct costs of the studied services were contained among the total costs of three of PC's operating divisions: New Jersey, Philadelphia and Chesapeake. The Philadelphia and Chesapeake Divisions' costs were summarized in the monthly Eastern Region financial statements as were the New Jersey Division's costs for the last nine months of 1970. The monthly Eastern Region financial statements for 1970 were used as data sources for this study. Since the New Jersey Division was part of the New York Region for the first three months of 1970, it was also necessary to reference the New York Region monthly financial statements.

On May 1, 1970, the Philadelphia Commuter Authority (PCA) was formed to take over all commuter operations in the Philadelphia area. At that time PCA assumed responsibility for some of the operations performed by each of the three divisions which were applicable to the services analyzed in this study. Consequently it was also necessary to utilize PCA financial reports.

Penn Central's system accounting records were reviewed to obtain ticket sales and service expense, maintenance of equipment expense, and system overhead expense.

The study was not restricted to PC's accounting data but also included an examination of operations, a review of available statistics and development of quantitative techniques that would provide a meaningful analysis of the available accounting data. Time studies, statistical samples, and ratio analyses were used to accurately quantify our observations and to reduce the amount of data requiring detailed analysis.

#### OPERATING STATISTICS

There were 65 trains involved in the studied service in 1970, of which 51 were conventional passenger trains and 14 were Metroliners. The cars

involved in the conventional studied service traveled 19,615,693 car-miles in 1970 while the Metroliner cars traveled 5,775,568 car-miles. These and other pertinent statistics pertaining to the studied trains are summarized in Exhibit I-2.

The number of car-miles attributed to the 51 conventional trains in the Phase II study is less than the number of car-miles attributed to the 46 trains in the Phase I study. This is due to the fact that certain services included in the Phase I study were not to be included in the present study and, consequently, the statistics generated by the cars performing these services (e.g., head-end cars, dining cars, sleepers, and through southern cars) were not included in the total Phase II statistics. The amount of locomotive ton-miles attributed to the studied conventional trains in 1970 was less than the amount of locomotive ton-miles attributed to the 46 trains in 1968 due to a decrease in the average number of locomotive units used per train.

In certain other areas of our Phase II report, operating statistics and the allocations resulting from use of these statistics differ from our Phase I report. This is due to the more sophisticated allocation techniques that we developed in our three special studies and used in our Phase II report.

II - ALLOCATION OF REGION AND SYSTEM OVERHEAD

In order to fully allocate all of the regional and system administrative costs to the studied trains, Region and System overhead factors were developed. By multiplying the amount in each expense category charged to the studied trains by, first, the Region overhead factor, and then by the System overhead factor, the amounts of regional overhead expense and system overhead expense to be charged to both the studied conventional service and the Metroliner service were determined.

REGIONAL  
OVERHEAD

An Eastern Region administrative expense of \$18,860,000 for 1970 was obtained from the Eastern Region Financial Statement, December 1970, as was a total Eastern Region expense of \$247,313,000 for the year. The costs of Joint Facilities, \$11,351,000, Northeast Corridor Demonstration Coordination, \$127,000, and certain station cleaning and utilities expenses, \$845,853, were subtracted from the Eastern Region administrative expense to obtain the Eastern Region administrative cost to be allocated, \$6,536,147. Since the Joint Facilities are independently administered and bill PC not only for direct charges but also for a portion of their administrative expenses, their expense was not included in the Eastern Region administration cost to be allocated but was directly allocated to the studied services where applicable. The expense for coordination of the Northeast Corridor Demonstration Project was excluded from the Eastern Region administration cost but was allocated to the Metroliner service as a maintenance of equipment expense. Station expenses for electricity and cleaning at Penn Station, New York, cleaning at Newark and cleaning at 30th Street Station, Philadelphia, were not included in the Eastern Region



administrative cost. These expenses were charged to the appropriate station and allocated with the other station expenses.

The Philadelphia Commuter Area (PCA) administrative expense, \$848,000, and its total expense for 1970, \$14,811,000, were obtained from the Philadelphia Commuter Area monthly financial statements. Although the PCA was organized and separated from the Eastern Region in May, 1970, PCA expenses were included in the development of a regional overhead factor because certain Corridor station, maintenance and transportation expenses remained under PCA responsibility.

The net Eastern Region administrative cost and PCA administration cost were added to obtain the total region overhead cost to be allocated, \$7,384,147. Subtracting the administrative expenses from the total expenses for both yields a regional allocation base of \$242,416,000. The region overhead expense was then divided by the allocation base to obtain a Region overhead factor of .0305. Exhibit II-1 reflects these calculations.

The New Jersey Division was in the New York Region for the first three months of 1970. The regional overhead factor developed for the New York Region for this three-month period was only slightly higher than the overhead factor developed for the Eastern Region. Because of the negligible difference in final results, we elected to use the Eastern Region overhead factor throughout the analysis.

SYSTEM  
OVERHEAD

In order to develop the System overhead expense, we reviewed all of the responsibility centers reporting on the Penn Central System level. The 1970 net expenses for these centers were summarized by functional group and are shown on Exhibit II-2.1. The following expenses were excluded from the System overhead calculation:

1. Ticket sales and service expenses at major Corridor passenger stations and at ticket sales offices were subtracted from the total system passenger service expense since these expenses were allocated as direct Station expenses.

2. The cost for the Wilmington Shops medical department was subtracted from the Labor Relations expense, and all of the system maintenance of equipment costs were deducted from the total system operations expense. These costs were allocated as direct Maintenance of Equipment expenses.

3. Total System operations expense was also reduced by dining, sleeping and parlor car service expense, which was allocated as a Transportation expense, and building and structure depreciation, which was allocated as a Maintenance of Way and Structure expense.

The amounts remaining in the System level responsibility centers were summed to obtain a total 1970 System overhead expense of \$154,498,720. Total railroad operating expense, \$1,635,468,602, was obtained from I.C.C. Form A, Schedule 320 for 1970. The System overhead expense was subtracted from the total Railroad operating expense to yield a System allocation base of \$1,480,969,882. The ratio of System overhead expense to System allocation base resulted in a System overhead factor of .1043. These calculations are shown in Exhibit II-2.2.

By applying, first, the Region overhead factor, and then the System overhead factor to each type expense directly chargeable to the studied trains, the fully allocated costs of the studied services were developed.

III - PASSENGER STATION EXPENSE

This section of the report discusses the allocation of those expenses associated with the operation of passenger stations. The objective of the study was to identify all expenses applicable to passenger stations in the Northeast Corridor, and then to determine what portion of those expenses should be charged to the studied passenger services.

BACKGROUND

From an analysis of the responsibility center reports, study of station operations, and other investigations we determined that there are seven general expense categories or accounts applicable to station expenses. Passenger station expenses associated with the studied trains are summarized according to these expense categories on the facing page.

Prior to allocating station expenses to the studied trains, a detailed study of 30th Street Station, Philadelphia was conducted to determine the nature of these expenses, and to develop techniques that would provide the most equitable allocation of each category of Station expense. This study is included in this report as Appendix A. The allocation techniques developed at 30th Street Station were applied to the other major Corridor stations and used in allocating passenger station expenses to the studied trains.

During 1970, the studied trains stopped at eight major stations and six smaller stations. In addition, five ticket sales offices which supported the operation of the studied trains were considered in this report. These stations and ticket offices are summarized in Exhibit III-1. The smaller stations are classified as passenger agencies in this report to distinguish them from the

major stations and the ticket sales offices whose expenses were allocated using different techniques. Washington Terminal expenses, except for the Metroliner ticket reservation system expense, are included in the Joint Facilities section of the report. The five ticket sales offices are included because they are the only non-Corridor ticket selling locations that have the Metroliner ticket reservation system.

On the basis of our analysis of mail and baggage expense during the 30th Street Station Study, we decided to exclude baggage handling expense from this study. Our reasons, which are discussed more fully in Appendix A, are:

- Only a very small percent of the 65 studied trains carried baggage.
- Only 9.6% of the baggage handling expense at 30th Street Station was allocable to the studied trains.
- Over half of the baggage checked on the studied trains at 30th Street was checked to destinations beyond New York or Washington.
- Relatively few of the Metroliner passengers check baggage on other trains having baggage cars (less than 3 passengers per month).

Depreciation for station buildings was not considered as a station expense in this report because of the difficulty in identifying the depreciation expense applicable to a particular station from the accounting records. Rather, depreciation is included in the Maintenance of Way and Structure section of this report and allocated there as an M of W overhead expense to the studied trains.

#### TICKET SALES AND SERVICE

All major Northeast Corridor stations, with the exception of the North Philadelphia Station, have separate responsibility centers for ticket sales and service expenses. North Philadelphia's responsibility center includes both mail



and baggage expense and ticket sales and service expense. Three of the eight major stations have reservations and information bureaus as well as ticket sales bureaus. These reservations and information bureaus, which are located at Penn Central Station, New York; 30th Street Station, Philadelphia; and Baltimore, provide reservation and information service for the other Corridor stations, with the exception of Wilmington, and also provide reservation and information service for other stations outside the Corridor. Wilmington handles reservations and information for its own area but does not have a separate information and reservation bureau, and does not separate the expenses of this function.

All of the expenses for the Capital Beltway Station are included in Baltimore's responsibility center.

Based on our studies at 30th Street Station, we decided to separate ticket sales costs and reservations and information costs and to allocate these expenses to the studied passenger services separately. Ticket selling expenses were allocated on the basis of the total ticket selling time devoted to the studied passenger services. Reservation and information expense allocations were based on the amount of time spent handling telephone inquiries related to the studied passenger services.

We first broke both the ticket selling and reservation and information functions into three categories: (1) operations relating to studied conventional service, (2) operations relating to Metroliner service and (3) operations related to all other services. We then closely observed each type of operation and through the use of work measurement techniques calculated the average amount of time required to perform each type of operation for both the ticket selling function and for the reservation and information function.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Passenger Station Expense  
Allocated to Studied Passenger Service - 1970

	Conventional	
	<u>Studied</u>	Metroliner
	<u>Service</u>	<u>Service</u>
Ticket Sales and Service	\$ 1,301,155	1,181,019
Ticket Sales Offices	14,840	251,430
Passenger Agencies	35,554	-
Stationmaster	425,239	149,105
Station Cleaning	285,979	85,969
Station Utilities	434,603	130,493
Station Maintenance	<u>309,016</u>	<u>90,988</u>
Station Expense Allocated to Studied Service	2,806,386	1,889,004
Region Overhead	<u>85,595</u>	<u>57,615</u>
Sub Total	2,891,981	1,946,619
System Overhead	<u>301,634</u>	<u>203,032</u>
Total Station Expense Applicable to Studied Service	<u>\$ 3,193,615</u>	<u>2,149,651</u>

We then determined the volume of activity in both the ticket selling function and the reservation and information function for each of the three types of operations at each of the stations having these functions. This was done in the following manner:

1. The index of activity selected for the ticket selling function was "number of tickets sold." To develop ticket sales statistics by type of service, we analyzed the Burroughs Ticketeer machine sales tapes and Metroliner sales reports using the statistical sampling technique developed for the 30th Street Station Study. This type of analysis was necessary because of a lack of historical data pertaining to the number of conventional studied train tickets sold in relation to all other types of tickets sold through the Ticketeer machines.

2. The "number of telephone calls" received was selected as the best index of activity for the reservation and information operations. Due to a lack of adequate historical data from which telephone call statistics could be developed, actual surveys were conducted at the three locations with reservation and information bureaus. Telephone operators were asked to make a stroke count of the number of reservation and information telephone calls received in reference to the Metroliners and to the conventional studied trains. The total reservation and information calls were metered. This survey was conducted for a 7-day period at 30th Street Station and Baltimore. At Penn Central, New York, we were only able to perform a one day survey due to problems within the reservation and information bureau. Consequently, the results obtained at Penn Central must be qualified due to the short duration of the study.

The volume of activity for each type operation was multiplied by the average amount of time required to perform each type of operation to develop a time factor for each operation. The ratio of the time factor for each operation to the total of the time factors was used to determine the total amount of time devoted to perform each operation or the amount of time devoted to each service. The amount of ticket selling time or workload devoted to each service at the major passenger stations is developed and shown in Exhibit III-2.1, while the amount of reservation and information time or workload devoted to each service at the different locations performing the function is developed and shown in Exhibit III-2.2.

The total ticket sales and service expense for the eight major stations amounted to \$5,386,681 in 1970, as shown in Exhibit III-2.4. The total expense

for the Metroliner ticket reservation system (TRS) at these stations, \$227,954, was charged directly to the Metroliner operations. Subtracting the Metroliner TRS expense from the total ticket sales and service expense results in \$5,211,400 to be allocated to ticket sales and reservation and information. By using the ratio of direct labor expense for ticket clerks and for the reservation and information clerks to total direct labor expense, which was developed in Exhibit III-2.3, \$1,860,697 was allocated to ticket sales and \$3,267,619 to reservation and information.

Ticket sales expense of \$454,844 and \$730,295 was then allocated to the Metroliners and to the conventional studied trains, respectively, on the basis of the allocation factors developed for each station as shown in Exhibit III-2.1. These calculations are shown on Exhibit III-2.5. Reservation and information expense of \$498,221 was allocated to Metroliners and \$570,860 to conventional studied trains on the basis of the allocation factors developed in Exhibit III-2.2. These calculations are shown in Exhibit III-2.6.

Ticket sales and service expenses allocated to the studied trains are summarized in Exhibit III-2.7, which shows \$1,181,019 allocated to Metroliners and \$1,301,155 allocated to conventional studied trains.

#### TICKET SALES OFFICES

The ticket sales offices included in this study are those locations that have the Metroliner ticket reservation system. These locations are shown on Exhibit III-1. The expenses for the Du Pont Building, Wilmington are not shown separately in this section, but are included with the Wilmington station expenses.

We believe that the best method for allocating ticket sales office expenses is on the basis of the percent of total ticket selling workload devoted to the studied passenger services. The approach we used to develop the allocation



factors is identical to the approach used for the ticket selling function at the major stations. Ticket sales were analyzed using the same statistical technique. The number of tickets sold by Metroliner, conventional studied train and other train category were multiplied by the average ticket sales transaction time for each ticket category to determine the percent of total workload applicable to each of three types of services. These calculations are shown on Exhibit III-3.1.

To determine the ticket sales office expense to be allocated to the studied trains, we first subtracted the Metroliner ticket reservation system expense of \$72,084 from the total ticket sales office expense of \$1,033,133 as shown on Exhibit III-3.2. This results in a net expense of \$961,049. The Metroliner TRS expense was charged directly to the Metroliners. By applying the allocation factors, developed for each location in Exhibit III-3.1, to the net expense, \$961,049, results in an allocated expense of \$179,346 to the Metroliners and \$14,840 to conventional studied trains. When the Metroliner TRS expense is added, a total ticket sales office expense of \$251,430 was allocable to the Metroliners while \$14,840 was allocated to the studied conventional trains.

#### PASSENGER AGENCIES

The smaller stations at which the studied trains stop are classified as passenger agencies in this report and are shown in Exhibit III-1. No Metroliners stop at any of these stations so none of these expenses were allocated to Metroliner operations. Although 14 smaller passenger stations were used by the studied trains, eight were excluded from this study because the total number of stops at each of these stations by the studied conventional trains was less than 5 per week or represented less than 3% of the total station utilization. The expenses allocated at these stations would have been minimal.

All of the expenses for the Princeton and Princeton Junction Stations were charged to one responsibility center and consequently are allocated as one expense in this report. Since each of the five remaining passenger stations are "common" facilities, providing both freight and passenger service, it was necessary to first determine what proportion of the expenses of each was related to passenger service. This was done by determining the 1970 direct labor expense for passenger service at each station from the Passenger Station Operations Report (Form PD-1) and developing the ratio of passenger service direct labor expense to the total direct labor expense as shown in that station's responsibility report. This ratio was applied to the balance of the expense in the responsibility center, and the result was added to the direct labor expense applicable to passenger service to determine total expense at each of the agencies resulting from passenger operations.

In order to allocate the portion of each station's expense related to passenger operations to the studied conventional service, we developed the ratio of the number of stops made per week at each station by the studied conventional trains to the total number of stops made by all passenger trains at that station. This ratio was applied to the total passenger related expenses at each station to determine the passenger agency expense allocable to the studied conventional service. These calculations, which are shown in Exhibits III-4.1 and III-4.2, resulted in an allocation of \$35,554 to the studied conventional trains.

#### STATIONMASTER

The Stationmaster function is a separate responsibility center at the seven major passenger stations included in this study. Essentially, the Stationmaster is responsible for station operations and for the operation of all the trains within the station. Based on our studies at 30th Street Station, we determined that the workload of the Stationmaster's department relates to the number of

trains stopping at the station. Therefore, we developed the ratio of the number of stops per week for the studied trains to the number of stops per week for all trains at each of the seven stations. The frequency of utilization of each station by the studied trains is shown in Exhibit III-5.1 and was used to allocate Stationmaster expense.

In 1970, \$1,432,421 was charged to the Stationmaster responsibility centers at the seven major Corridor stations. A net expense of \$1,249,807 results when Redcap revenues, which amounted to \$182,614 at these stations, is subtracted from the total expense. By applying the frequency of station utilization factors to the net expense for each station, \$144,105 was allocated to the Metroliners and \$410,978 was allocated to the conventional studied trains. Transportation administrative expense was added resulting in \$149,105 of total Stationmaster expense being allocated to the Metroliners and \$425,239 to the conventional studied trains. These calculations are shown in Exhibit III-5.2.

#### STATION CLEANING

The New Jersey Division Manager of Buildings furnishes contract cleaning services to the Penn Central, New York and the Newark stations. Although a portion of the cleaning expense was charged directly to the ticket sales and service and mail and baggage responsibility centers at these stations, most of this expense is allocated to the studied trains in this section of the report. The Philadelphia Division Supervisor of Buildings provided cleaning services to 30th Street Station for part of the year and the Supervisor of Suburban Cleaners (Philadelphia Commuter Area) furnished these services for the remainder of the year. The direct labor expense for cleaning 30th Street Station was determined from the charges to the station's product cost centers. The ratio

of this expense to total direct labor expense contained in the Supervisor of Buildings and Supervisor of Suburban Cleaners responsibility centers for the appropriate period was used to allocate supervision, supplemental wage and the balance of the expenses contained in these responsibility centers to 30th Street Station. Direct labor expense was added to the allocated expense to arrive at the total cleaning expense for the station.

Cleaning services at the North Philadelphia, Wilmington and Baltimore stations are provided by mail and baggage personnel. The 1970 direct labor expense for cleaning at these stations was determined from the Passenger Station Operations Report (Form PD-1) and the ratio of this expense to total direct labor expense was used to allocate supervision, supplemental wage and other controllable costs which were added to the direct labor costs to obtain the total cleaning costs for each station.

We determined from our study of 30th Street Station that passenger utilization of each station would be the most equitable method of allocating the cleaning expenses at the seven major stations to the studied trains. Passenger count statistics were developed to arrive at the average number of passengers per week getting on and off trains at each of the stations. These statistics are summarized in Exhibit III-6. The ratio of studied train passengers to total passengers using the station was used to allocate cleaning expenses to the studied trains.

As shown in Exhibit III-7, a total 1970 cleaning expense of \$870,125 was determined to be applicable to the major stations. Applying the passenger utilization factors to the applicable expense at each station resulted in \$85,969 being allocated to the Metroliners and \$285,979 to the conventional studied trains.

STATION UTILITIES

Station utilities expenses considered in this report are the costs of heating, electricity, water and sewage. Telephone expense was charged directly to the responsibility center incurring the expense through PC's accounting system.

The utilities expenses for Penn Central Station, New York, Newark, 30th Street and Baltimore are contained in various Maintenance of Equipment, Maintenance of Way and Structure, and divisional responsibility centers. Eastern Region accounts payable records, analysis of purpose accounts within responsibility centers, special studies of utilities usage, and allocations based on relative area (square feet), were used to determine the expense applicable to these four major stations. A more detailed account of how this procedure was employed at 30th Street Station is contained in Appendix A. The utilities expenses for Trenton, North Philadelphia, and Wilmington had been previously allocated to the appropriate station responsibility centers through PC's accounting system and consequently are not included in this section of the report.

We believe that the most equitable way to allocate station utilities expenses to the studied trains is on the basis of passenger utilization of each station. The utilities expense determined to be applicable to these four major stations amounted to \$1,417,966 for 1970, as shown in Exhibit III-8. When the regional maintenance overhead factors are applied, a total utilities expense for these stations of \$1,521,248 results. Allocating the total utilities expense at each station on the basis of passenger utilization of the station, as shown in Exhibit III-6, results in \$130,493 being charged to the Metroliners and \$434,603 being charged to the conventional studied trains. These allocations are shown in Exhibit III-8.

STATION MAINTENANCE

Maintenance of station equipment expenses are contained in various Maintenance of Equipment responsibility centers. Similarly, expenses for station structure maintenance are contained in various Maintenance of Way and Structures responsibility centers. In order to determine the expense applicable to each major station, we analyzed charges to station product cost centers and work orders; calculated direct expenses where necessary; and used direct labor expense ratios to allocate supervision, supplemental wage costs, and the remaining expenses in the appropriate responsibility centers.

Since station maintenance expenses are similar to station cleaning and utilities expenses, in that they affect the whole station, we believe that the most equitable way to allocate maintenance expenses to the studied trains is on the basis of passenger utilization of the station. As shown in Exhibit III-9, the maintenance expense determined to be applicable to the seven major stations was \$906,575 for 1970. Applying the regional maintenance overhead factors resulted in a total maintenance expense applicable to these stations of \$1,092,046. Allocation of the total maintenance expense at each station on the basis of passenger utilization of the station developed in Exhibit III-6, resulted in \$90,988 being charged to Metroliner service and \$309,016 being charged to the conventional studied service. These allocations are shown in Exhibit III-9.

SUMMARY

Utilizing the previously described allocation techniques resulted in a total direct station expense of \$2,806,386 being allocated to the studied conventional service while \$1,889,004 was allocated to studied Metroliner service. A region overhead expense of \$85,595 was then charged to the conventional service

and \$57,615 to the Metroliners. Finally a system overhead expense of \$301,634 was allocated to the studied conventional service and \$203,032 to the Metroliner. Summing the total direct passenger station expense, region overhead and system overhead resulted in a total passenger station expense allocated to the studied conventional service of \$3,193,615 and a total passenger station expense allocated to the Metroliner service of \$2,149,651. All of the expenses allocated to passenger stations are summarized on the facing page at the beginning of this chapter.



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Washington Terminal Expenses  
Allocated to Studied Services - 1970

Expense Allocated To Studied Conventional Passenger Service	\$ <u>1,960,294</u>
Expense Billed To Metroliner Service	\$ <u>808,038</u>

IV - JOINT FACILITIES

The organizations with which Penn Central is involved in joint facility operations are PATH, RF&P, Long Island Railroad, New York Connecting, Central Railroad of New Jersey and Washington Terminal Company (WTC). Due to the accounting techniques which are used to collect the costs of those facilities, it was necessary to analyze only those costs billed to Penn Central by the Washington Terminal Company (WTC) to calculate the fully allocated costs of the studied services.

The net cost of operating Washington Terminal during 1970, after deducting concession revenues, was \$9,464,370. This does not include those Maintenance of Equipment (MofE) charges which were billed directly to the railroads utilizing the Washington Terminal. Those M of E costs billed directly to Penn Central by WTC are analyzed in Chapter VI of this report.

The net cost of operating Washington Terminal was allocated and billed to each of the using railroads on the basis the number of the railroad's cars and engines entering and leaving Washington Terminal. During 1970 there were 155,868 movements by PC cars and locomotives into and out of Washington Terminal. This resulted in an allocation of and billing to PC of \$5,069,222 of the WTC net cost of operations. The labor agreement with railway employees which was settled in February 1971 resulted in an additional \$273,385 expense being charged to PC's portion of the 1970 WTC expense, resulting in a total WTC charge for 1970 to Penn Central of \$5,342,607. Included in this figure is the portion of WTC expenses, applicable to Metroliner operations, \$808,038, which was collected and billed separately. There were 56,599 cars in the studied conventional service which entered and left Washington Terminal in 1970. This represented 43.23%

of the total locomotives and cars (other than Metroliners) entering and leaving Washington Terminal in 1970. Using this as the allocation basis resulted in a charge of \$1,960,294 to the studied conventional service for 1970.

Exhibits IV-1 and IV-2 summarize these calculations.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Transportation Expenses  
Allocated to Studied Services

	Studied Conventional Service	Metroliner Service
Train Crew	\$ 5,953,463	1,212,438
Electric Power	1,114,788	746,760
Block Stations	493,748	177,522
Division Operator	214,424	84,679
Assistant Superintendent of Transportation - Passenger Services	150,211	61,473
Yard and Switching	1,374,358	69,825
Crew Dispatcher - Philadelphia Division	28,489	-
Transportation Administration	<u>313,112</u>	<u>73,343</u>
Total Direct Transportation Expense	9,642,593	2,426,040
Region Overhead (.0305 of Total Direct Transportation Expense. 1.)	<u>284,763</u>	<u>66,702</u>
	9,927,356	2,492,742
System Overhead (.1043 of Total Regional Transportation Expense)	<u>1,035,423</u>	<u>259,993</u>
Total Transportation Expense Allocated to Studied Services	<u>\$ 10,962,779</u>	<u>2,752,735</u>

1. Less Dining Car Department Expense.

V - TRANSPORTATION

This section of the report discusses those expenses which are incurred in the control and operation of those trains providing the studied conventional and Metroliner services. As in Phase I of this study, stationmaster and trainmaster expenses, which are normally considered transportation expenses, are analyzed and included in the Station portion of this study. This was done to better identify all of the costs involved in the operation of passenger terminals.

BACKGROUND

All of the transportation responsibility centers related to the Eastern Region and Philadelphia Commuter Area were analyzed to determine if they contained any cost applicable to the studied services. Those centers related solely to freight or float operations were immediately excluded from the analysis. Each of the remaining responsibility centers was analyzed to determine its relationship to the studied services.

The Transportation costs associated with the operation of the studied conventional service and the studied Metroliner service are summarized on the facing page. These costs are grouped into expense categories which correspond generally to the responsibility centers analyzed.

Three different methods of costing were used in this section of the report. Where possible, actual costs were accumulated from operating reports. This was done for train crew wage expense. The road electric power expense allocated to the studied services was based on engineering estimates prepared by PC of the power consumed per mile for each type of equipment and accounting estimates of the cost to PC of power each month. The other transportation expenses were allocated to the studied services using what was considered to be the most appropriate statistic for allocating each expense.

TRAIN CREW WAGE  
EXPENSE

The train crew wage expense consists of the wages and benefits of trainmen and enginemen and that portion of the wages and benefits of parlor car attendants and coach attendants not related to food service operations.

The train and engine crew wage expenses were divided into four categories for analysis:

1. Direct Crew Wage Expenses (DCWE) - those wage costs directly attributable to specific runs.
2. Other Supplemental Wage Expenses (OSWE) - including irregular service, terminal delay, deadhead, backout, qualifying and arbitraries' compensation.
3. Retroactive Wage Adjustments (RWA) - retroactive wage increases for work performed prior to the signing of the labor contract.
4. Fringe Benefit Expenses (FBE) - including health and welfare, pension, railroad unemployment tax, supplementary annuity tax, railroad retirement tax, vacations, and holidays.

(a) Train and Engine Crew Wage Expenses

DCWE and OSWE for the train and engine crew on those trains in the studied service were taken directly from the Monthly Crew Wage Expense Report.

FBE, for 1970 as computed by PC officials and used in their standard costing procedures, was 25.46% of the total of DCWE and OSWE.

RWA for train and engine crews was 5% of DCWE and OSWE for the first ten months of 1970 and 13.5% for the last two months of the year. This resulted in an overall RWA of 6% of DCWE and OSWE for 1970.

DCWE, OSWE, FBE, and RWA were added together to get the total train and engine crew expense applicable to the studied services. This resulted in a train and engine crew wage expense for the studied conventional service in 1970 of \$5,647,374 and a train and engine crew wage expense for Metroliner

service of \$973,358 of which \$52,452 was the cost of crew wages on Metroliner shop trains in 1970. Metroliner shop trains were special trains used to deliver disabled Metroliner cars to the Wilmington Car Shops for repairs. Train and engine crew wage expenses are summarized in Exhibit V-1.1.

(b) Parlor and Coach Attendant  
Wage Expense

Parlor car and coach attendants are members of the Dining Car Department which is a system level management center at PC. Labor costs are not collected by type train but by type of service (e.g., coach attendants, parlor car attendants, and parlor lounge attendants). The direct labor expense for each type service was collected, and to this was added FBE, RWA, and Dining Car Department overhead to obtain the total wage expense and overhead for each type of service offered by the Dining Car Department.

To determine the expense applicable to the studied trains the ratio of scheduled labor hours on the studied trains to the total scheduled labor hours was developed for each type of service and applied to total wage expense and overhead for that service.

Since the cost of food service operations was to be excluded from our study it was necessary to further allocate the wage expenses of parlor lounge attendants who were involved in food service operations. Dining Car Department officials concluded that 53% of the time of parlor lounge attendants was spent in non-food service operations. This percentage was used to further allocate the parlor lounge service expense. Of the parlor lounge service expense allocated to the studied service, 55.81% was applicable to Metroliner service. None of the coach attendant or parlor car attendant expense was applicable to Metroliner operations.



These calculations resulted in \$306,089 of coach attendant, parlor car attendant, and parlor lounge attendant service expense being allocated to the studied conventional service while \$239,080 of parlor lounge attendant expense was allocated to Metroliner service. These computations are shown in Exhibit V-1.2.

Exhibit V-1.3 summarizes the train crew expense and shows a total train crew wage expense of \$5,953,463 being allocated to the studied conventional service while \$1,212,438 was allocated to the Metroliner service.

ELECTRIC POWER  
EXPENSE

The direct electric power expense for the studied trains was computed through the use of standard cost techniques. The total electric power cost for each month is the product of three quantities:

1. The number of car-miles traveled that month (as obtained from wheel reports for each train).
2. The "monthly factor", which represents the number of kilowatt-hours consumed per car mile for each type of equipment (as computed by PC industrial engineers).
3. The "rate" which represents the cost of electricity to the railroad expressed in dollars per kilowatt-hours.

Using this technique resulted in a direct electric power expense allocation to the studied conventional trains of \$950,286 and an allocation of \$746,760 to the Metroliners. Exhibit V-2.1 shows the development of this expense for the studied conventional trains while Exhibit V-2.2 shows the development of direct power expense for the Metroliners.

The indirect propulsion expense consists of three items:

- Fuel used in generating steam heat on electric locomotives
- Train communications equipment rental
- Diesel fuel used by yard switching engines

It was determined that these expenses apply solely to the conventional passenger service. To allocate a portion of these expenses to the studied conventional trains, a ratio of the road power purchased for the studied conventional service to the road passenger power purchased for all conventional service was developed. Using this percentage resulted in an allocation of \$164,502 of indirect propulsion expense to the studied conventional service. These calculations are shown in Exhibit V-2.3.

The total electric power expense applicable to the studied conventional service in 1970 was \$1,114,788 and \$746,760 was applicable to the Metroliner service. This summary is shown in Exhibit V-2.4.

#### BLOCK STATIONS

The block stations studied are those which control train movement on the mainline tracks between New York and Washington. Workloads at block stations are related to the number of train movements controlled. For this reason it was decided to allocate the cost of each block station in proportion to the number of trains passing that station.

As was done in Phase I of this study, a valid statistical sample was selected to estimate the total numbers of train movements past each block station. The number of movements past each block station by the studied trains was determined through an analysis of timetables. The number of movements of the studied conventional trains and of the Metroliners as a percent of the total number of movements past each block station was then computed. These percentages

were used to apportion the expense attributed to each block station in 1970 to the studied conventional trains and to the Metroliners. This resulted in a block station expense of \$493,748 being allocated to the studied conventional trains and \$177,522 being allocated to Metroliner operations. These calculations are summarized in Exhibits V-3.1 through Exhibit V-3.4.

#### DIVISION OPERATOR

The primary function of the Division Operator is to supervise the operations of the block stations in his division. Consequently, the allocation of the Division Operator's expense to the studied trains was done in the same manner as the allocation of block station expenses.

The ratios of the block station expense directly applicable to the studied conventional service and Metroliner service to the total division block station expense were developed and used to allocate each of the three Division Operator's expense for 1970. This resulted in an allocation of \$214,424 to the studied conventional service and \$84,679 to the Metroliner service. These calculations are shown in Exhibit V-4.1 through Exhibit V-4.4.

#### ASSISTANT SUPERINTENDENT OF TRANSPORTATION - PASSENGER SERVICES

Each of the Divisional Assistant Superintendents of Transportation - Passenger Services is responsible for all passenger train movements in his division and for supervising all passenger train crewmen operating in his division. We believe that the most equitable method of allocating this expense to the studied services is on the basis of passenger train miles. Since statistics for passenger-train-miles are not available by division, it was necessary

to use statistics developed for the Eastern Region. The expenses for the Assistant Superintendent of Transportation for each division were obtained from the various responsibility reports and summed to obtain the total Assistant Superintendent of Transportation - Passenger Services expense for the Eastern Region. The ratios of the passenger train miles traveled by the studied conventional trains and by the Metroliners to the total passenger train miles traveled in the Eastern Region was used to allocate the Assistant Superintendent of Transportation - Passenger Services expense to the studied services. Exhibit V-5 shows these calculations which resulted in \$150,211 being charged to the studied conventional trains and \$61,473 being allocated to the Metroliners.

#### YARD AND SWITCHING

Yard and switching operations involving cars in the studied service took place in four locations: (1) Washington Terminal; (2) Penn Central Station, New York; (3) Sunnyside Yard, New York; and (4) Penn Coach Yard, Philadelphia. The yard and switching expenses incurred at Washington Terminal were allocated and billed to Penn Central by the Washington Terminal Company and are treated in Chapter IV of this report which deals with Joint Facilities expenses. The yard switching expenses incurred at Penn Station, Sunnyside, and Penn Coach Yard will be discussed here.

We believe that the most equitable method, given the information available, for allocating yard and switching expenses is on the basis of the number of movements into and out of a location. It was possible to do this at Pennsylvania Station and Sunnyside by analyzing the movements past block stations F, Jo, and A and Q and R, respectively. This resulted in an allocation of \$251,882 of Penn Station's yard and switching expense to the studied conventional trains and

\$46,474 to Metroliner operations. At Sunnyside \$239,048 was allocated to the studied conventional service and \$23,351 to the Metroliners.

It was not possible to use this allocation technique for Penn Coach Yard because there are no block stations solely involved in controlling movement into and out of the yard. After a discussion with PC officials we decided to allocate the Penn Coach Yard expenses using the ratio of the number of men involved in switching cars used in the studied services to the total number of men dispatched for switching in Penn Coach Yard. Since none of the Metroliners normally utilize Penn Coach Yard, expenses were allocated only to the studied conventional trains.

While performing a detailed study of the allocation of the expenses of 30th St. Station (Appendix A) we discovered that \$56,175 of cleaning expenses which had been charged to the Superintendent of Buildings, Philadelphia Division, responsibility center were for work done at Penn Coach Yard. We also discovered that \$15,540 of Penn Coach Yard's expense had been miscoded and charged to the 30th Street Station Stationmaster responsibility center. Adding these expenses to the trainmaster and train and engine expense at Penn Coach Yard resulted in a total yearly expense of \$1,075,253 of which \$883,428 was allocated to the studied conventional passenger service. Exhibit V-6.1 shows the expenses allocated at Penn Station, Sunnyside, and Penn Coach Yard.

A total of \$1,374,358 of yard and switching expense was allocated to the studied conventional trains while \$69,825 was allocated to Metroliner. The yard and switching expense summary is shown in Exhibit V-6.2.

CREW DISPATCHER -  
PHILADELPHIA DIVISION

The Crew Dispatcher is responsible for assigning all train crew members for passenger, freight, and yard movements. Since only the Philadelphia Division has a separate responsibility center for this operation, it is the only one analyzed here. Elsewhere in the Eastern Region the Crew Dispatcher's expenses are in the Division Superintendent of Transportation's responsibility center.

In May of 1970 the Philadelphia Commuter Area (PCA) was formed and a responsibility center for the PCA Crew Dispatcher was established. There were no changes in the functions or responsibility of the Philadelphia Division Crew Dispatcher, the only change being that now a portion of his expenses were charged to the PCA Crew Dispatcher Responsibility Center. Consequently, to properly analyze this expense, the amounts charged to both responsibility centers in 1970 were summed to get a total Crew Dispatcher expense.

As in Phase I of our study, the crew dispatching operations were observed. We found that 11 of the 27 crew dispatchers devoted all of their time to dispatching crewmen for passenger operations. The remaining 16 dispatchers handled the dispatching of crews for yard and freight movements. Based on this analysis 40.7% of the expenses incurred by the Crew Dispatcher were assigned to passenger operations.

During 1970, out of a total of 371 men dispatched daily for passenger operations, 43 were dispatched for service on the studied conventional trains. None were dispatched for service on Metroliners since all of the dispatching for this service is being done in New York or Washington. The ratio of the number

of men dispatched for the studied conventional passenger trains to the total number of men dispatched for all passenger trains was used to further allocate that portion of the Crew Dispatcher's expense apportioned to passenger operations.

Since crew members in Penn Coach Yard do some switching in connection with the operation of the studied conventional trains, it was necessary to determine what proportion of non-passenger related crew dispatching expense should be assigned to the studied conventional trains. Of the 580 men dispatched daily by the freight and yard dispatchers, 31 are dispatched to Penn Coach Yard to switch cars involved in the studied conventional service. The ratio of men dispatched for switching cars in the studied conventional service to total number of men dispatched by the freight and yard dispatchers was used to further allocate that portion of the Crew Dispatcher's expense apportioned to freight and yard operations.

The above calculations, which are shown in Exhibit V-7, resulted in an allocation of \$28,489 of the Crew Dispatcher's expense to the studied conventional service.

#### TRANSPORTATION ADMINISTRATION

The transportation administration expense consists of the expenses incurred by those PC officials, on both the division and the region level, who provide either supervision or administrative support to those PC employees engaged in transportation activities. Transportation administration expense includes the senior transportation officials on both the regional and divisional level and the Assistant Superintendent - Motive Power, Superintendent Train Movement, Division Road Foreman, and Supervisor Train Operations on the divisional level.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Maintenance of Equipment  
Costs Allocated to Studied Services - 1970

	<u>Studied</u> <u>Conventional</u> <u>Service</u>	<u>Metroliner</u> <u>Service</u>
Maintenance Cost		
Electric Locomotives	\$ 2,286,032	
Locomotive Propelled Cars	5,158,502	
Metroliner Cars		4,928,803
Equipment Capital Cost		
Electric Locomotives	277,875	
Locomotive Propelled Cars	320,752	
Metroliner Cars	<u>                    </u>	<u>1,684,238</u>
Total Maintenance of Equipment Costs Applicable to Studied Services	<u>\$ 8,043,161</u>	<u>6,613,041</u>



VI - MAINTENANCE OF EQUIPMENT

This section presents the maintenance of equipment costs associated with Metroliners and the studied conventional trains for 1970. These costs include expenses related to repair and inspection, locomotive and train supplies, engine-house, and equipment capital costs.

BACKGROUND

Electric locomotives (GG1) and locomotive propelled cars were utilized on all of the studied conventional trains throughout 1970, and special Metroliner cars were used on all of the Metroliners. This equipment is included in this study.

The cost data for Metroliner maintenance was taken from reports which originated in the responsibility centers and joint facilities performing this maintenance. The Metroliner maintenance cost from Wilmington Heavy Repair Shops, the major Metroliner repair facility, is the result of an allocated cost study of that facility's 1970 operations, which is included in this report as Appendix B.

I.C.C. Form-A Maintenance of Equipment (MofE) data was used to develop locomotive-mile maintenance factors for the electric locomotives and car-mile maintenance factors for locomotive propelled cars. It was necessary to develop a combined maintenance factor for both GG1 electric locomotives, which were used on the studied trains, and E44 electric locomotives because maintenance cost data are collected for all electric locomotive together. These factors were then applied to the locomotive-miles and the passenger-car-miles traveled by the studied trains in 1970 to develop the MofE costs for the conventional trains. Car-miles for head-end cars, diners, sleepers and through southern cars on the studied trains were excluded when computing the MofE costs of the studied trains.

The 1970 MofE cost allocated to the Metroliners and to the studied conventional trains is shown on the facing page VI-1.

#### METHODOLOGY

Different techniques were used to accumulate the MofE cost for the studied conventional trains and the Metroliners. The methods used and the rationale for using these techniques are discussed in this subsection.

##### (a) Studied Conventional Trains

As in the Phase I study, we believe that the best approach to obtaining defensible costs for the studied conventional trains was to develop mileage cost factors for each equipment category, and to apply these factors to the equipment employed in the studied conventional service. This necessitated computing a cost per locomotive-mile factor for electric locomotives and a cost per car-mile factor for the locomotive propelled cars.

Several conditions dictated this approach. First, the railroad's scheduling policy does not consider specific units as being unique to any one service area; i.e., a locomotive that pulled one of the studied trains one day could be assigned to an East-West passenger run or a freight run the next day. Thus, it was not possible to identify specific units that were used only on the studied trains and then to compute the costs of these units.

In addition, the railroad does not assign MofE costs on a regional basis. Rather, some maintenance costs become a System responsibility and others become a region responsibility. Thus, all MofE costs for Northeast Corridor trains are not directly distributed to the Eastern Region.

For these reasons, we constructed cost-per-mile factors for each type of equipment. These factors were then applied to the number of miles traveled

by each type of equipment in the studied conventional service in 1970 to arrive at a total MofE cost for the studied service.

The first step in this method was to compute mileage cost factors for all direct costs. As seen in Exhibit VI-1.1, this was accomplished by (1) summing the costs which can be directly related to the operations of electric locomotives and locomotive propelled cars and (2) dividing into this the total number of miles traveled in 1970 by each type of unit. (Note that these mileage figures are totals for the System.) The resulting factors are \$.7726 per locomotive miles for the electric locomotives and \$.2464 per car-mile for the locomotive propelled cars.

The second step involved distribution of indirect MofE costs by relating them to direct costs. Here, also, System cost totals were used (see Exhibit VI-1.2). In Column (1) are listed those expenses which cannot be directly assigned to operations but which must be allocated as part of overhead. The amounts in Column (2) represent those expenses which are directly attributable to the direct maintenance of equipment. Column (3) shows those expenses which are usually included in the MofE expense category but which are not directly or indirectly related to the cost of actually maintaining equipment.

The total indirect expenses (Column (1)) were divided by the total direct expenses (Column (2)) to produce a cost relationship ratio. Our findings indicate that, for the System, MofE indirect costs are 10.32% of direct costs.

A capital cost factor for electric locomotives and for locomotive propelled cars was obtained by dividing the 1970 depreciation expense for the

electric locomotives and the locomotive propelled cars by 1970 System electric locomotive-miles and System passenger-car-miles, respectively. The capital cost factors, the development of which is shown in Exhibit VI-1.3, are \$.1036 per locomotive-mile and \$.0169 per locomotive propelled car-mile.

The MofE cost, less capital cost, for the studied conventional trains was then calculated by adding the direct maintenance factor for electric locomotives and locomotive propelled cars and the indirect cost factor for each: 10.32% of the direct cost factor. The electric locomotive cost factor was then multiplied by the locomotive-miles traveled by the studied trains and the locomotive propelled car factor was multiplied by the passenger car-miles applicable to the studied service. The resulting costs were then increased by 10.43% to reflect System overhead. This resulted in a maintenance cost of \$2,286,032 being allocated to the GGLs used on the studied trains and \$5,158,502 being allocated to the locomotive propelled cars used in the studied conventional service.

A capital cost for locomotives and locomotive propelled cars was then computed by multiplying the capital cost factor developed for electric locomotives by the locomotive-miles attributable to the studied trains and the capital cost factors developed for locomotive propelled cars by the passenger-car-miles traveled in the studied service. The resulting costs were then increased by 10.43% to reflect System overhead. This resulted in a capital cost of \$277,875 being allocated to the electric locomotives used in the studied service and \$320,752 being allocated to the locomotive propelled cars used in the studied conventional service. This calculation and as well as the calculations used to develop direct maintenance costs are shown in Exhibit VI-1.4.

(b) Metroliners

Several factors influenced the decision to accumulate Metroliner MofE costs by operating facility, rather than as a System equipment category cost, as had been done with the studied conventional trains.

1. Metroliner costs are routinely isolated and accumulated by PC for reporting purposes in connection with the Demonstration Project.

2. Metroliners operate only in the New York to Washington Corridor, which is entirely within the Eastern Region.

3. A fully allocated cost study was made at the Wilmington Heavy Repair Shop, the major repair facility for the Metroliners. This study, which provides detailed information on the largest portion of Metroliner repair costs, is included as Appendix B of this report.

For these reasons, the best approach to developing Metroliner MofE costs appears to be by operating facility, relying primarily on PC's Responsibility Reporting System as the source of data.

The repair costs for Metroliners at Washington Terminal were isolated and billed separately to PC as direct charges. This amounted to \$839,441 in 1970.

The costs incurred at the Wilmington Heavy Repair Shops for Metroliner repairs in 1970, \$2,283,300, were developed through the fully allocated cost study of this facility, which is included in this report as Appendix B.

Maintenance and repair costs for Metroliners were incurred at other PC facilities. These other PC equipment maintenance center costs amounted to \$435,763 in 1970.

The Northeast Corridor Coordinator is responsible for administering PC's contract with the Department of Transportation to operate the Metroliner Service. Since most of his time is spent handling Metroliner equipment problems, and since his expenses were formerly summarized under System MofE expenses, his expenses are included here along with the Metroliner equipment

expenses. The Northeast Corridor Coordinator and his task force incurred \$302,561 in expenses in 1970.

After the Metroliner warranty period expired, it was necessary to have representatives of the equipment manufacturers on the operating Metroliners to repair any breakdowns that occurred. These technical support fees amounted to \$473,923 in 1970.

The insurance premiums for the Metroliner equipment in 1970 were \$128,295.

Totaling these expenditures results in a direct maintenance cost of \$4,463,283 being charged to Metroliner operations in 1970. Adding to this a proportionate share of System overhead results in a total maintenance expense of \$4,928,803 being allocated to Metroliner operations.

The Metroliner capital equipment cost is based on the schedule of payments to be made under the 20 year lease PC has on the Metroliner cars. This lease calls for \$28,241,532 to be paid over a 20-year period, or \$1,412,077 a year. To this should be added \$113,086, the cost of the Metroliner equipment modification discussed in Appendix B. With the addition of System overhead, the total capital equipment cost applicable to Metroliner operations in 1970 is \$1,684,238.

#### SUMMARY

In 1970 the total MofE costs allocated to the studied conventional trains were \$8,043,161. During the same period \$6,613,041 of MofE costs were charged to Metroliner operations. These expenses are summarized on the facing page at the beginning of this chapter.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Maintenance of Way and Structures Expense  
Related to Studied Services

<u>Type Expense</u>	Studied Conventional <u>Service</u>	Metroliner <u>Service</u>
Track	\$ 1,417,257	394,052
Communications and Signals	897,469	329,913
Electric traction	457,017	359,154
Structures	<u>372,706</u>	<u>103,626</u>
Expenses Directly Allocated	3,144,449	1,186,745
Region Overhead	95,906	36,196
System Overhead	<u>337,969</u>	<u>127,553</u>
Total Maintenance of Way and Structure Expense Allocated to Service	3,578,324	1,350,494
Expenses Charged Directly	<u>-</u>	<u>2,101,599</u>
Total Maintenance of Way and Structure Expense Related to Service	<u>\$ 3,578,324</u>	<u>3,452,093</u>

VII - MAINTENANCE OF WAY AND STRUCTURES

This section of the report includes an analysis of those costs which are incurred in maintaining the fixed assets of the railroad, other than equipment. The major expense categories are track, communications and signals, electric traction and structures.

BACKGROUND

A literature search was conducted to identify the approaches that have been used to distribute Maintenance of Way and Structures (MofW&S) Expense. Discussions were held with maintenance engineers of the Penn Central Transportation Company as well as representatives of a professional engineering firm and the American Railway Engineering Association. There appears to be consensus that a generally accepted method of allocating MofW&S expense has not been developed by the railroad industry.

After a review of PC's cost accounting system and operating statistics, it was determined that the most equitable allocation to the studied passenger services would result from distributing each of the major expense categories separately.

DETERMINATION OF MAINTENANCE OF WAY AND STRUCTURES EXPENSE TO BE ALLOCATED

Penn Central's third level responsibility reports were used to collect the MofW&S expense by major expense category for each of the divisions in the Eastern region and for the regional headquarters.

(a) Expenses Deducted

As noted in Appendix C, a review by a professional engineering firm indicated that \$259,296 of the total region's MofW&S expense was applicable



only to Metroliner operations. These expenses were deducted from the MofW&S expense prior to allocation and charged directly to Metroliner operations.

During the review of Station expenses, \$784,823 of MofW&S expense was determined to be directly related to station operations. This expense was also deducted from MofW&S expense prior to allocation and transferred to station expenses and allocated with those expenses.

Although it would have been preferable to allocate all of the MofW&S expenses on the divisional level it was not possible to do this for the majority of the MofW&S expense categories because the necessary expense information or operating statistics were not available by division. It was possible to allocate the Communications and Signals expense on a divisional level and, consequently, it was necessary to deduct the Communications and Signals expense of the Harrisburg Division, which was not involved in Northeast Corridor operations, before allocating the remainder of the expense.

(b) Expenses Added

MofW&S depreciation, which had formerly been charged to the regional chief engineer's responsibility center, was treated as a system expense in 1970 and the records were no longer kept to determine what portion was related to the Eastern Region. To determine Eastern Region-related MofW&S depreciation expense in 1970, the percent of total System MofW&S depreciation represented by the Eastern Region MofW&S depreciation expense in 1968 was determined. Applying this percent to the total System depreciation expense in 1970 resulted in an Eastern Region MofW&S depreciation expense of \$10,350,000, which was added to the regional MofW&S expenses to be allocated.

These additions and deletions, which resulted in an Eastern Region MofW&S expense to be allocated of \$41,773,817, are shown in Exhibit VII-1.1.

Since the New Jersey Division was part of the New York Region for the first three months of 1970 it was necessary to analyze its expenses for this period separately. The non-divisional expenses were first allocated to each of the expense categories in the New Jersey Division on the basis of operating expenses. The resulting New Jersey MofW&S expense to be allocated for the first three months of 1970 was \$3,603,721. These calculations are shown in Exhibit VII-1.2.

(c) Maintenance of Way and  
Structures Overhead

The Eastern Region MofW&S overhead was computed by summing the expenses for each of the divisional chief engineers, the regional engineer, and the MofW&S depreciation attributable to the Eastern Region. This amounted to \$11,386,941. The ratio of MofW&S overhead to MofW&S direct expense was computed and found to be .3461. All of the Eastern Region direct MofW&S expenses were increased by 34.61% prior to being allocated. The computation of Eastern Region MofW&S overhead is shown in Exhibit VII-1.3.

(d) Summary

The direct expenses to be allocated for track, communications and signals, electric traction, and structures for the Eastern Region, New Jersey Division, Philadelphia Division, Chesapeake Division and Harrisburg Division were totaled. To this was added Eastern Region MofW&S overhead and the expenses of the New Jersey Division for the first three months of 1970. This

resulted in the following expenses to be allocated:

• Track	\$ 25,554,548
• Communications and Signals	7,651,055
• Electric Traction	4,581,630
• Structures	<u>6,720,261</u>

Exhibit VII-1.4 shows the development of these totals.

ALLOCATION OF MAINTENANCE OF WAY AND  
STRUCTURES EXPENSE TO STUDIED SERVICE

Each of the four major expense categories were analyzed and the most equitable method of allocation for each was first determined, and then used in allocating the expenses attributed to that category.

(a) Track

Track expenses were allocated to the studied services on the basis of gross ton-miles traveled in 1970. Of all the operating information available, gross ton-miles provided the best estimate of track and roadbed usage. First, the gross ton-miles traveled by the studied conventional trains and by the Metroliners was computed using the monthly wheel reports for each train, the train consists, and the average weight of each type of equipment. The gross ton-miles traveled by all trains in the Eastern Region was obtained from the data collected by the Eastern Region for the I.C.C. Report Form OS-A and from Penn Central Report P-11. The calculation of gross ton-miles for the Eastern Region is shown in Exhibit VII-2.1.

The ratios of the gross ton-miles traveled by the studied conventional trains to total Eastern Region gross ton-miles and of the gross ton-miles traveled by the Metroliners to total Eastern Region gross ton-miles were developed. These computations are shown in Exhibit VII-2.2. These ratios were

then used to allocate track expense to the studied conventional trains to the Metroliners. As a result of this distribution, \$1,417,257 of track expense was charged to the studied conventional trains and \$394,052 of track expense to the Metroliners. Exhibit VII-3.2 shows the allocation to the studied conventional trains and Exhibit VII-3.3 shows the allocation to the Metroliners.

(b) Communications and  
Signals

The Communications and Signals expense pertains to the costs of operating signals along the right-of-way and communications between block stations. The most equitable allocation of this expense was determined to be on the basis of the block station expense allocated to the studied services.

The ratios of direct block station expense allocated to the studied conventional trains and to the Metroliners to the total block station expense of the New Jersey, Philadelphia, and Chesapeake Divisions was calculated and used to allocate Communications and Signals expense to the studied conventional trains and to the Metroliners. The calculation of these ratios is shown in Exhibit VII-2.2 and the allocations to the studied conventional trains and to the Metroliners are shown in Exhibits VII-3.2 and VII-3.3, respectively. The Communications and Signals Expense charged to the studied conventional service was \$897,469 and the amount charged to the Metroliner was \$329,913.

(c) Electric Traction

The Electric Traction expense pertains to the operations and maintenance of the power transmission facilities along those sections of track which are electrified. We determined that the most equitable method for allocating this expense would be on the basis of direct electric power expense. Exhibit VII-2.2 shows the development of the ratios of the direct power expense charged to the

studied conventional trains and to the Metroliners to the total direct power expense for the Eastern Region for 1970 and the New Jersey Division for the first three months of the year.

Applying the electric power factor ratios to the electric traction expense for the Eastern Region resulted in an allocation of \$457,017 to the studied conventional trains and \$359,154 to the Metroliners. Exhibits VII-3.2 and VII-3.3 show these allocations.

(d) Structures

The structures expenses were incurred in the maintenance of buildings, tunnels, bridges, and other similar facilities along the railroad right-of-way. The most equitable method of allocating this expense appears to be on a service basis. Consequently the gross ton-mile factors that were developed to allocate track expense were used to allocate these expenses. Exhibit VII-2.2 shows the development of this ratio and Exhibit VII-3.2 and VII-3.3 show the allocations which resulted in charges of \$372,706 to the studied conventional service and \$103,626 to the Metroliners.

(e) Region and System  
Overhead

The amount of Region and System overhead to be charged to the Maintenance of Way and Structures expense allocated to the studied conventional trains and to the Metroliners was developed using the technique developed in Chapter II of the report. This resulted in region overhead charges of \$95,906 to the studied conventional trains and \$36,196 to the Metroliners. The System overhead charges to the MofW&S allocation were \$337,969 to the studied conventional trains and \$127,553 to the Metroliners. These charges are shown in Exhibits VII-3.2 and VII-3.3.

(f) Maintenance of Way and Structures  
Allocation Summary

The total of MofW&S expense and related region and system overhead to be allocated to the studied conventional trains for 1970 operations is \$3,578,324 and the amount to be allocated to Metroliner operations is \$1,350,494. A summary of these expenses is shown in Exhibits VII-3.2 and VII-3.3 and on the facing page at the beginning of this chapter.

DIRECT MAINTENANCE OF WAY AND STRUCTURES  
CHARGES TO METROLINER SERVICE

As part of Penn Central's contract with the U. S. Department of Transportation, it was agreed that Penn Central would identify and collect all MofW&S expenses in the Northeast Corridor which were incurred solely for Metroliner operations. An engineering consulting firm was retained by the Department of Transportation to review these incremental costs. As of the date of this report it had been determined that \$259,296 of the Eastern Region's 1970 MofW&S expenses were attributable solely to Metroliner operations. Appendix C discusses these costs in more detail.

From 1965 through August 1970 PC made substantial expenditures to upgrade track and roadbed in the Northeast Corridor for the higher speed Metroliner operations. These costs were collected in I.C.C. accounts 80 and 1 through 47. Appendix C discusses the technique used to relate these costs to 1970 Metroliner operations. All of the costs directly attributable to Metroliner operations are shown in Exhibit VII-3.1. They resulted in an increase of the MofW&S costs attributable to Metroliner operations of \$2,101,599. The total MofW&S cost attributable to the Metroliner service, which is shown in Exhibit VII-3.3 and on the facing page at the beginning of this chapter, in 1970 was \$3,452,093.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Taxes Allocated to Studied Services

	Studied Conventional <u>Service</u>	Metroliner <u>Service</u>
Gross Receipts	\$ 25,982	11,256
Capital Stock/Net Worth	108,315	23,311
Property	<u>225,683</u>	<u>37,511</u>
Total Taxes Allocated to Studied Services	<u>\$ 359,980</u>	<u>72,078</u>

VIII - TAXES

This section of the report presents the results of a study made on the allocation of accrued taxes for 1970 to 65 selected passenger trains in the New York-Washington Corridor. The techniques which were developed for making each of the allocations are also explained in this section. The 65 selected trains consist of 14 Metroliners and 51 conventional passenger trains. The states for which tax liabilities were accrued are those located along the Corridor: New York, Pennsylvania, New Jersey, Delaware, Maryland and District of Columbia.

OBJECTIVE

The objective of the study was to identify all state and Federal taxes accrued during 1970 that were applicable to interstate passenger operations in the Corridor and then to determine what portion of those taxes should be allocated to the Metroliner service and what part should be charged to the studied conventional passenger service.

METHODOLOGY

We studied the following list of taxes, which are paid by Penn Central, to determine which were applicable to Corridor passenger operations.

- Gross Receipts
- Capital Stock/Net Worth
- Property
- Sales and Use
- Net Income



We found that all five taxes were applicable to Corridor passenger operations. The allocation of three of the taxes are discussed in this section and the reasons for not discussing the other two of the taxes are stated below.

Penn Central considers the sales and use tax as part of the cost of material; the allocation of material cost is covered in those sections of this report which have material as one of their expense factors. Consequently the sales and use tax is not allocated in this section.

Taxes were not levied in 1970 against Penn Central's net income by any of the Corridor states or by the Federal government because the Company sustained a loss for the year on its passenger operations. Consequently no Federal or state taxes on net income are included in the study.

(a) Gross Receipts Tax

We studied the method for calculating the gross receipts tax for each of the Corridor states and found that New York and Pennsylvania applied the gross receipts tax to intra-state traffic only and that New Jersey, Delaware and the District of Columbia did not levy a tax on gross receipts. Maryland was the only state in which the gross receipts tax was applicable to Corridor passenger operations.

The total Maryland gross receipts tax for 1970 was \$699,970. We determined that \$46,898 of this tax was applicable to passenger operations based on the proportion of Penn Central's Maryland passenger revenue to Penn Central's total operating revenue in Maryland. The further distribution of Maryland gross receipts tax to the Metroliners and to the studied conventional trains was made on the basis of their respective revenues as a portion of total passenger revenue in Maryland and resulted in an allocation of \$25,982 of the gross receipts tax to the studied conventional trains and \$11,256 to the Metroliners.

(b) Capital Stock/Net Worth Tax

A tax is levied by the states of New York and Pennsylvania against the capital stock and net worth of the Penn Central Transportation Company. The formula used in both states for calculating this tax uses the percentage of PC's assets in that state to total Penn Central assets to determine how much of the Company's capital stock/net worth should be used as a tax base. Since this tax is not directly related to any operational parameter, various allocation bases were evaluated before concluding that the fairest method for allocating this would be on the basis of gross receipts. Therefore, out of a 1970 total capital stock/net worth tax of \$2,354,673 (the amount of both the New York and Pennsylvania taxes), \$108,315 was allocated to the studied conventional trains and \$23,311 to the Metroliners.

(c) Property Taxes

There were no property taxes levied by the states of New York or New Jersey which were applicable to Corridor passenger operations. In Pennsylvania, those property taxes applicable to Corridor passenger operations were levied on 30th Street Station, Penn Coach Yard, and North Philadelphia Station. The taxes on these properties for 1970, \$463,112, were allocated to the studied conventional trains and to the Metroliners on the basis of their frequency of utilization of each facility to the total utilization of the facility. This resulted in an allocation of \$168,028 of Pennsylvania property taxes to the studied conventional trains and \$8,449 to the Metroliners.

The property taxes levied by Delaware on the Wilmington Station and Wilmington Heavy Repair Shop (WHRS) were applicable to Corridor passenger operations. The same basis used to allocate the Pennsylvania property taxes, frequency of use, was used to allocate the Wilmington Station property taxes

of \$15,027. This resulted in an allocation of \$4,238 to the studied conventional trains and \$2,179 to the Metroliners. The property taxes of \$42,983 levied on the WHRS were allocated to the studied services on the basis of the Metroliner and GGI repair costs incurred at Wilmington as a percent of the total WHRS expenses. Consequently an allocation of \$3,185 of the WHRS property taxes was made to studied conventional trains and \$5,814 to the Metroliners.

Maryland property taxes applicable to Corridor passenger operations were levied on right-of-way, track, electrified property, rolling stock, and substations. The total tax levied on these properties for 1970 was \$692,575. Using as an allocation base the number of car-miles traveled by each of the two types of trains to total car-miles traveled in the State (including freight) resulted in an allocation of \$42,738 to the studied conventional trains and \$18,103 to the Metroliners.

Property taxes levied by the District of Columbia in 1970 which were applicable to Corridor operations totaled \$14,699. Using the same allocation basis that was used to allocate Maryland property taxes, \$7,494 was charged to the studied conventional trains and \$2,966 to the Metroliners.

A summary of the property taxes allocated to the studied conventional trains, \$225,683 and to the Metroliners, \$37,511, is shown in Exhibit VIII-1.

#### SUMMARY

A listing of the taxes applicable to Corridor service by state is shown in Exhibit VIII-2. In 1970 the total tax accruals applicable to Corridor operations was \$4,283,039. Of this, \$359,980 was allocated to studied conventional passenger service and \$72,078 was allocated to Metroliner operations. Since I.C.C. accounting does not recognize taxes as a "Railway Operating Expense", they were not included in the overhead allocation base.

Consequently, neither Region nor System overhead was added to the tax allocation.

The allocations by type of tax allocated to the studied conventional service and to the Metroliner service are shown on the facing page at the beginning of this section of the report.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Conventional Passenger Trains Providing Studied Service

<u>Train Number</u>	<u>Frequency</u>	<u>Origin</u>	<u>Destination</u>
126	D	Washington	New York
130	D	Washington	New York
131	De Sun	New York	Washington
132	D	Washington	New York
133	D	New York	Washington
135	D	New York	Washington
137	D	New York	Washington
139	De Sun	New York	Washington
147	D	New York	Washington
152	D	Washington	New York
154	De Sat	Washington	New York
155	D	New York	Washington
158	D	Washington	New York
159	Sun	New York	Washington
161	Sun	New York	Washington
166	Sat & Sun	Washington	New York
170	D	Washington	New York
171	D	New York	Washington
172	D	Washington	New York
173	D	New York	Washington
174	D	Washington	New York
175	D	New York	Washington
176	D	Washington	New York
177	De Sun	New York	Washington
200	De Sun	Philadelphia	New York
201	De Sat & Sun	New York	Philadelphia
202	De Sat & Sun	Philadelphia	New York
204	D	Philadelphia	New York
206	De Sun	Philadelphia	New York
207	De Sun	New York	Philadelphia
211	D	New York	Philadelphia
212	D	Philadelphia	New York
213	D	New York	Philadelphia
215	De Sat	New York	Philadelphia
218	D	Philadelphia	New York
219	D	New York	Philadelphia
220	De Sat & Sun	Philadelphia	New York
221	De Sat	New York	Philadelphia
223	De Sat & Sun	New York	Philadelphia
225	D	New York	Philadelphia
227	D	New York	Philadelphia
231	D	New York	Philadelphia

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Conventional Passenger Trains Providing Studied Service

<u>Train Number</u>	<u>Frequency</u>	<u>Origin</u>	<u>Destination</u>
234	Sat	Philadelphia	New York
235	D	New York	Philadelphia
254	De Sat & Sun	Philadelphia	New York
256	De Sun	Philadelphia	New York
272	Sat	Philadelphia	New York
280	Sun	Philadelphia	New York
282	Sun	Philadelphia	New York
298	Sun	Philadelphia	New York
401	De Sat & Sun	Philadelphia	Washington

D - Daily

De Sun - Daily except Sunday

De Sat - Daily except Saturday

De Sat & Sun - Daily except Saturday, Sunday & Holidays

Sun - Sunday only

Sat - Saturday only

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Metroliner Passenger Trains  
Providing Studied Service

<u>Train Number</u>	<u>Frequency</u>	<u>Origin</u>	<u>Destination</u>
100	De Sat & Sun	Washington	New York
101	De Sat & Sun	New York	Washington
102	D	Washington	New York
103	D	New York	Washington
104	D	Washington	New York
105	D	New York	Washington
106	D	Washington	New York
107	D	New York	Washington
108	D	Washington	New York
109	D	New York	Washington
110	Sun - Fri	Washington	New York
111	Sun - Fri	New York	Washington
112	Sun - Fri	Washington	New York
113	Sun - Fri	New York	Washington

D - Daily

De Sat & Sun - Daily except Saturday and Sunday

Sun - Fri - Sunday through Friday

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Studied Service - Operating Statistics - 1970

	<u>Studied Conventional Service</u>	<u>Metroliner Service</u>	<u>Total Studied Service</u>
Number of trains	51	14	65
Number of trips	14,760	4,689	19,449
Number of cars and locomotives used	122,410	24,932	147,342
Number of car-miles traveled	19,615,693	5,775,568	25,391,261
Gross-ton-miles traveled	1,713,944,633.5	476,484,360	2,190,428,993.5



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Development of Region Overhead Factor - 1970

Eastern Region Administration*	\$ 18,860,000	
Less: Joint Facilities	11,351,000	
Northeast Corridor Demonstration		
Coordination	127,000	
Station Cleaning and Utilities	<u>845,853</u>	6,536,147
Philadelphia Commuter Area Administration**		<u>848,000</u>
Region Overhead		\$ <u>7,384,147</u>
Total Eastern Region Expense*	\$ 247,313,000	
Less: Eastern Region Administration	<u>18,860,000</u>	228,453,000
Total Philadelphia Commuter Area Expense	14,811,000	
Less: Philadelphia Commuter Area		
Administration**	<u>848,000</u>	<u>13,963,000</u>
Region Allocation Base		\$ <u>242,416,000</u>
Region Overhead Factor	\$ <u>7,384,147</u>	= .0305
	\$242,416,000	

\*Source: Eastern Region Financial Statement, December, 1970.

\*\*Source: Philadelphia Commuter Area Financial Statements, May-December, 1970.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of 1970 System Overhead Expense

		<u>System Overhead Expense</u>
Executive Department	\$	1,811,158
Treasury and Investments		4,851,630
Accounting and Budgets		26,791,463
Personnel		846,453
Public Relations and Advertising		2,092,242
Research		979,797
Services		1,216,075
Passenger Service	\$	8,552,881
Less: Ticket Sales and Service (1)		<u>4,827,556</u>
Tax Department		1,116,992
Traffic and Marketing		20,932,577
Legal Department		7,794,797
Systems Development		26,335,857
Labor Relations	\$	2,850,607
Less: Wilmington Shops Medical Dept. (2)		<u>26,435</u>
Secretary		1,194,491
Industrial Development and Real Estate		3,348,945
Other System Activities		17,736
Operations	\$	225,729,497
Less: Dining, Sleeping and Parlor Car Service (3)		10,810,602
Maintenance of Equipment and Heavy Repair Shops (2)		135,608,926
Building and Structure Depreciation (4)		31,106,802
Equipment Use Assessment (5)		<u>15,484,866</u>
Purchases and Material		15,097,734
Corporate Adjustments		<u>802,975</u>
	\$	<u>154,498,720</u>

## Notes:

- (1) Treated as part of Passenger Station Expense.
- (2) Treated as part of Maintenance of Equipment Expense.
- (3) Treated as part of Transportation Expense.
- (4) Treated as part of Maintenance of Way and Structure Expense.
- (5) Applicable equipment rental expense included in Maintenance of Equipment.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Development of System Overhead Factor - 1970

Total Railroad Operating Expenses (1)	\$ 1,635,468,602
Less: System Overhead Expense (2)	<u>154,498,720</u>
System Allocation Base	<u>\$ 1,480,969,882</u>

System Overhead Factor       $\frac{\$ 154,498,720}{\$1,480,969,882} = .1043$

(1) Source: I.C.C. Form A, Schedule 320, 1970.

(2) Source: Exhibit II-2.1

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Stations and Ticket Sales Offices

<u>Major Stations</u>	<u>Number of Studied Trains Using Station</u>
1. Penn Central, New York	64
2. Newark	63
3. Trenton	58
4. North Philadelphia	50
5. 30th Street, Philadelphia	65
6. Wilmington	37
7. Baltimore	39

<u>Passenger Agencies</u>	
1. Elizabeth	4
2. New Brunswick	24
3. Princeton Junction	26
4. Chester	2
5. Aberdeen	6
6. Capital Beltway	13

<u>Ticket Sales Offices</u>
1. Hudson Terminal, New York
2. Grand Central Terminal, New York
3. Suburban Station, Philadelphia
4. Du Pont Building, Wilmington
5. City Ticket Office, Washington

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Major Station Ticket Sales Allocation Method  
Percent of Total Ticket Selling Workload Devoted to Studied Passenger Service

<u>Major Station</u>	(1) Number of Tickets Sold*	(2) Average Sales Transac- tion Time** (Minutes/Ticket)	(1)x(2) = (3) Relative Workload (Minutes)	(4) Percent of Total Workload
Penn Central, New York				
Metroliners	9,013	.97	8,743	27.7%
Conventional Studied Trains	19,727	.52	10,258	32.5
Other Trains	<u>29,186</u>	.43	<u>12,550</u>	<u>39.8</u>
Total	57,926		31,551	100.0%
Newark				
Metroliners	1,076	.97	1,044	8.9%
Conventional Studied Trains	6,484	.52	3,372	28.7
Other Trains	<u>17,026</u>	.43	<u>7,321</u>	<u>62.4</u>
Total	24,586		11,737	100.0%
Trenton				
Metroliners	637	.97	618	9.0%
Conventional Studied Trains	10,019	.52	5,210	75.8
Other Trains	<u>2,435</u>	.43	<u>1,047</u>	<u>15.2</u>
Total	13,091		6,875	100.0%
North Philadelphia				
Metroliners	-	-	-	-
Conventional Studied Trains	6,159	.52	3,203	69.3%
Other Trains	<u>3,300</u>	.43	<u>1,419</u>	<u>30.7</u>
Total	9,459		4,622	100.0%
30th Street, Philadelphia				
Metroliners	6,178	.97	5,993	28.8%
Conventional Studied Trains	13,887	.52	7,221	34.7
Other Trains	<u>17,647</u>	.43	<u>7,588</u>	<u>36.5</u>
Total	37,712		20,802	100.0%
Wilmington***				
Metroliners	2,236	.97	2,169	38.7%
Conventional Studied Trains	5,693	.52	2,960	52.7
Other Trains	<u>1,115</u>	.43	<u>480</u>	<u>8.6</u>
Total	9,044		5,609	100.0%
Baltimore****				
Metroliners	4,311	.97	4,182	55.6%
Conventional Studied Trains	5,296	.52	2,754	36.7
Other Trains	<u>1,347</u>	.43	<u>579</u>	<u>7.7</u>
Total	10,954		7,515	100.0%

\*Source: Statistical sample of Metroliner and conventional train ticket sales.

\*\*Source: PMM&Co. time studies conducted at 30th Street Station.

\*\*\*Includes Du Pont Building ticket sales office.

\*\*\*\*Includes Capital Beltway Station.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Reservation and Information Allocation Method  
Percent of Total Reservations and Information Workload  
Devoted to Studied Passenger Service

<u>Major Station</u>	(1) Number of Phone Calls*	(2) Transaction Time Value** (Minutes/Call)	(1)x(2) = (3) Relative Workload (Minutes)	(4) Percent of Total Workload
Penn Central, New York				
Metroliners	1,818	1.20	2,182	12.1%
Conventional Studied Trains	1,656	1.43	2,368	13.1
Other Trains	<u>6,918</u>	1.95	<u>13,490</u>	<u>74.8</u>
Total	10,392		18,040	100.0%
30th Street, Philadelphia				
Metroliners	6,334	1.20	7,601	20.0%
Conventional Studied Trains	8,832	1.43	12,630	33.2
Other Trains	<u>9,116</u>	1.95	<u>17,776</u>	<u>46.8</u>
Total	24,282		38,007	100.0%
Baltimore				
Metroliners	1,706	1.20	2,047	41.4%
Conventional Studied Trains	704	1.43	1,007	20.4
Other Trains	<u>968</u>	1.95	<u>1,888</u>	<u>38.2</u>
Total	3,378		4,942	100.0%

\*Source for statistical data of the number of reservations and information phone calls received:

30th Street, 7-day operator stroke count (February 19-25, 1971)

Baltimore, 7-day operator stroke count (March 25-31, 1971)

New York, 1-day operator stroke count (April 15, 1971)

\*\*Source: PMM&Co. time studies conducted at 30th Street Station.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Ticket Sales and Service Direct Labor  
Expense Ratio

<u>Major Station</u>	1970 Direct Labor Expense*	Direct Labor Expense Ratio
Penn Central, New York		
Ticket Clerks	\$ 423,204	.225
Reservations and Information Clerks	<u>1,460,541</u>	<u>.775</u>
Total	1,883,745	1.000
30th Street, Philadelphia		
Ticket Clerks	158,246	.297
Reservations and Information Clerks	<u>374,107</u>	<u>.703</u>
Total	532,353	1.000
Baltimore		
Ticket Clerks	84,585	.442
Reservations and Information Clerks	<u>106,766</u>	<u>.558</u>
Total	191,351	1.000
North Philadelphia		
Ticket Clerks	85,272	.616
Mail and Baggage	28,214	.204
Station Cleaning	<u>24,977</u>	<u>.180</u>
Total	\$ 138,463	1.000

\*Source: Passenger Station Operations Reports (Form PD-1), 1970.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Ticket Sales and Service Expense to  
Ticket Sales and Reservation and Information

<u>Major Station</u>	<u>Total</u> <u>1970</u> <u>Expense</u>	<u>Less:</u> <u>Direct</u> <u>Metroliner</u> <u>Expense*</u>	<u>Net</u> <u>1970</u> <u>Expense</u>	<u>Ticket Sales</u> <u>Direct Labor</u> <u>Ratio</u>	<u>Allocation</u> <u>to</u> <u>Ticket</u> <u>Sales</u>	<u>Reservation</u> <u>and</u> <u>Information</u> <u>Direct Labor</u> <u>Ratio</u>	<u>Allocation to</u> <u>Reservation</u> <u>and</u> <u>Information</u>
Penn Central, New York	\$ 3,224,297	69,959	3,154,338	.225	\$ 709,726	.775	\$ 2,444,612
Newark	347,828	7,942	339,886	1.000	339,886	-	-
Trenton	108,398	4,223	104,175	1.000	104,175	-	-
North Philadelphia	216,365	-	216,365	.616	133,281	-	-
30th Street, Philadelphia	964,639	45,334	919,305	.297	273,034	.703	646,271
Wilmington	174,740	14,141	160,599	1.000	160,599	-	-
Baltimore	350,414	33,682	316,732	.442	139,996	.558	176,736
Washington Terminal	-	52,673	-	-	-	-	-
Total	<u>\$ 5,386,681</u>	<u>227,954</u>	<u>5,211,400</u>		<u>\$ 1,860,697</u>		<u>\$ 3,267,619</u>

\*Expense for Metroliner Ticket Reservation System allocated directly to Metroliner. Obtained from TRS invoices, 1970.



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Ticket Sales Expense to Studied Passenger Service

<u>Major Station</u>	<u>Ticket Sales Expense*</u>	<u>Conventional Studied Train Allocation Factor**</u>	<u>Expense Allocated to Conventional Studied Trains</u>	<u>Expense Allocated to Metroliner Allocation Factor**</u>	<u>Expense Allocated to Metroliners</u>
Penn Central, New York	\$ 709,726	.325	\$ 230,661	.277	\$ 196,594
Newark	339,886	.287	97,547	.089	30,250
Trenton	104,175	.758	78,965	.090	9,376
North Philadelphia	133,281	.693	92,364	-	-
30th Street, Philadelphia	273,034	.347	94,743	.288	78,634
Wilmington	160,599	.527	84,636	.387	62,152
Baltimore	<u>139,996</u>	.367	<u>51,379</u>	.556	<u>77,838</u>
	<u>\$ 1,860,697</u>		<u>\$ 730,295</u>		<u>\$ 454,844</u>

\*Exhibit III-2.4

\*\*Exhibit III-2.1, Column (4).

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Reservation and Information  
Expense to Studied Passenger Service

<u>Major Station</u>	<u>Reservations and Information Expense*</u>	<u>Conventional Studied Train Allocation Factor**</u>	<u>Expense Allocated to Conventional Studied Trains</u>	<u>Metroliner Allocation Factor**</u>	<u>Expense Allocated to Metroliners</u>
Penn Central, New York	\$ 2,444,612	.131	\$ 320,244	.121	\$ 295,798
30th Street, Philadelphia	646,271	.332	214,562	.200	129,254
Baltimore	<u>176,736</u>	.204	<u>36,054</u>	.414	<u>73,169</u>
Total	\$ <u>3,267,619</u>		\$ <u>570,860</u>		\$ <u>498,221</u>

\*Exhibit III-2.4.

\*\*Exhibit III-2.2, Column (4).

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Ticket Sales and Service Expense  
Allocated to Studied Passenger Service, 1970

	Conventional Studied <u>Trains</u>	<u>Metroliners</u>
Ticket Sales	\$ 730,295	454,844
Reservations and Information	570,860	498,221
Metroliner Ticket Reservation System	<u>-</u>	<u>227,954</u>
Ticket Sales and Service Expense Allocated to Studied Trains	<u>\$ 1,301,155</u>	<u>1,181,019</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Ticket Sales Office Allocation Method  
Percent of Total Ticket Selling Workload  
Devoted to Studied Passenger Service

<u>Ticket Sales Office</u>	(1) Number of Tickets Sold*	(2) Average Sales Transaction Time** (Minutes/Ticket)	(1)x(2) = (3) Relative Workload (Minutes)	(4) Percent of Total Workload
<b>Hudson Terminal, New York</b>				
Metroliners	742	.97	719	64.8%
Conventional Studied Trains	213	.52	111	10.0
Other Trains	<u>648</u>	.43	<u>279</u>	<u>25.2</u>
Total	1,603		1,109	100.0%
<b>Grand Central Terminal, N. Y.</b>				
Metroliners	91,693	.97	88,942	7.8%
Other Trains	<u>2,452,805</u>	.43	<u>1,054,706</u>	<u>92.2</u>
Total	2,544,498		1,143,648	100.0%
<b>Suburban Station, Philadelphia</b>				
Metroliners	1,392	.97	1,350	6.1%
Conventional Studied Trains	1,337	.52	695	3.1
Other Trains	<u>47,045</u>	.43	<u>20,229</u>	<u>90.8</u>
Total	49,744		22,274	100.0%
<b>City Ticket Office, Washington***</b>				
Metroliners	2,448	.97	2,375	93.5%
Conventional Studied Trains	201	.52	105	4.1
Other Trains	<u>141</u>	.43	<u>61</u>	<u>2.4</u>
Total	2,790		2,541	100.0%

\*Source: Statistical sample of Metroliner and conventional train ticket sales.  
Grand Central Terminal, total tickets sold during 1970.

\*\*Source: PMM&Co. time studies conducted at 30th Street Station.

\*\*\*Includes Penn Central Travel Bureau (Nassif Building)

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Ticket Sales Office Expense  
to Studied Passenger Service

<u>Ticket Sales Office</u>	<u>Total 1970 Expense</u>	<u>Less: Direct Metroliner Expense*</u>	<u>Net 1970 Expense</u>	<u>Conventional Studied Train Allocation Factor**</u>	<u>Expense Allocated to Conventional Studied Trains</u>	<u>Metroliner Allocation Factor**</u>	<u>Expense Allocated to Metroliners</u>
Hudson Terminal, New York	\$ 63,592	8,394	55,198	.100	\$ 5,520	.648	\$ 35,768
Grand Central Terminal, N. Y.	659,287	25,450	633,837	-	-	.078	49,439
Suburban Station, Philadelphia	197,651	14,362	183,289	.031	5,682	.061	11,181
Du Pont Building, Wilmington***	-	-	-	-	-	-	-
City Ticket Office, Washington	<u>112,603</u>	<u>23,878</u>	<u>88,725</u>	.041	<u>3,638</u>	.935	<u>82,958</u>
Total	\$ <u>1,033,133</u>	<u>72,084</u>	<u>961,049</u>		14,840		179,346
Metroliner Ticket Reservation System Expense					<u>-</u>		<u>72,084</u>
Ticket Sales Office Expense Allocated to Studied Trains					<u>\$ 14,840</u>		<u>\$ 251,430</u>

\*Expense for Metroliner Ticket Reservation System obtained from TRS invoices, 1970.

\*\*Exhibit III-3.1, Column (4).

\*\*\*Du Pont Building expense included in Wilmington Station expenses.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Passenger Agency Allocation Method  
Frequency of Station Utilization by Studied Trains

<u>Passenger Agency</u>	<u>Number of Stops Per Week*</u>		<u>Utilization of</u>
	<u>All Trains</u>	<u>Conventional Studied Trains</u>	<u>Station By Conventional Studied Trains</u>
Elizabeth	674	15	2.2%
New Brunswick	547	123	22.5
Princeton Junction	879	138	15.7
Chester	307	12	3.9
Aberdeen	32	21	65.6

\*Source: Eastern Region Timetable No. 5, in effect 4:01 A.M. E.S.T.,  
 Sunday, May 17, 1970.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Passenger Agency Expense  
to Studied Passenger Service

<u>Passenger Agency</u>	1970 Expense Applicable to <u>Passenger Service</u>	Percent Applicable to <u>Studied Trains*</u>	Expense Allocated to Conventional <u>Studied Trains</u>
Elizabeth	\$ 48,668	2.2%	\$ 1,071
New Brunswick	84,696	22.5	19,057
Princeton Junction	33,144	15.7	5,204
Chester	39,044	3.9	1,523
Aberdeen	12,454	65.6	8,170
Capital Beltway**	<u>-</u>	-	<u>-</u>
Total	\$ 218,006		35,025
			<u>529</u>
Stations Administrative Expense*** @ 1.51%			\$ 35,554

\*Exhibit III-4.1. Frequency of station utilization by conventional studied trains.

\*\*Capital Beltway expense included in Baltimore station expenses.

\*\*\*Source: Eastern Region Financial Statement, December, 1970.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Stationmaster Allocation Method  
Frequency of Station Utilization by Studied Trains

<u>Major Station</u>	<u>Number of Stops Per Week*</u>			<u>Utilization of Station</u>	
	<u>Conventional</u>			<u>By Studied Trains</u>	
	<u>All Trains</u>	<u>Studied Trains</u>	<u>Metroliners</u>	<u>Conventional</u>	<u>Conventional</u>
Penn Central, New York	1,251	281	90	22.5%	7.2%
Newark	1,637	281	84	17.2	5.1
Trenton	905	276	61	30.5	6.7
North Philadelphia 30th Street,	1,205	281	-	23.3	-
Philadelphia**	442	286	90	64.7	20.4
Wilmington	537	152	78	28.3	14.5
Baltimore	299	152	90	50.8	30.1

\*Source: Eastern Region Timetable No. 5, in effect 4:01 A.M. E.S.T.,  
 Sunday, May 17, 1970.

\*\*Includes trains stopping at the lower level of the station only.



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Stationmaster Expense to Studied Trains

<u>Major Station</u>	<u>Total 1970 Expense</u>	<u>Less: Redcap Revenues*</u>	<u>Net 1970 Expense</u>	<u>Percent Applicable to Conventional Studied Trains***</u>	<u>Expense Allocated to Conventional Studied Trains</u>	<u>Percent Applicable to Metroliners**</u>	<u>Expense Allocated to Metroliners</u>
Penn Central, New York	\$ 691,310	127,892	563,418	22.5%	\$ 126,769	7.2%	\$ 40,566
Newark	161,136	16,630	144,506	17.2	24,855	5.1	7,370
Trenton	107,374	-	107,374	30.5	32,749	6.7	7,194
North Philadelphia	39,838	3,722	36,116	23.3	8,415	-	-
30th Street, Philadelphia	234,299	17,614	216,685	64.7	140,195	20.4	44,204
Wilmington	67,378	3,767	63,611	28.3	18,002	14.5	9,224
Baltimore	<u>131,086</u>	<u>12,989</u>	<u>118,097</u>	50.8	<u>59,993</u>	30.1	<u>35,547</u>
Total	<u>\$ 1,432,421</u>	<u>182,614</u>	<u>1,249,807</u>		410,978		144,105
Transportation Administrative Expense @ 3.47%***					<u>14,261</u>		<u>5,000</u>
					<u>\$ 425,239</u>		<u>\$ 149,105</u>

\*Source: Passenger Station Operations Report (Form PD-1), 1970.

\*\*Exhibit III-5.1. Frequency of station utilization by studied trains.

\*\*\*Source: Exhibit V-8: Transportation Administrative Expense.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Station Cleaning, Utilities and Maintenance Allocation Method  
Studied Trains Passenger Utilization of Station

<u>Major Station</u>	<u>Metroliners</u>	<u>Conventional Studied Trains</u>	<u>Other Intercity and Through Trains</u>	<u>Commuter Trains</u>	<u>Total</u>
Penn Central, New York					
Number of Passengers Per Week	17,897	81,562	11,123	171,665	282,247
Passenger Utilization of Station	6.4%	28.9%	3.9%	60.8%	100.0%
Newark					
Number of Passengers Per Week	1,394	18,603	6,296	363,013	389,306
Passenger Utilization of Station	.4%	4.8%	1.6%	93.2%	100.0%
Trenton					
Number of Passengers Per Week	1,034	34,617	4,007	12,442	52,100
Passenger Utilization of Station	2.0%	66.4%	7.7%	23.9%	100.0%
North Philadelphia					
Number of Passengers Per Week	-	17,961	1,800	8,158	27,919
Passenger Utilization of Station	-	64.3%	6.5%	29.2%	100.0%
30th Street, Philadelphia					
Number of Passengers Per Week	11,832	40,524	1,581	93,765	147,702
Passenger Utilization of Station	8.0%	27.4%	1.1%	63.5%	100.0%
Wilmington					
Number of Passengers Per Week	3,136	8,037	242	6,379	17,794
Passenger Utilization of Station	17.6%	45.2%	1.4%	35.8%	100.0%
Baltimore					
Number of Passengers Per Week	5,280	9,061	365	845	15,551
Passenger Utilization of Station	34.0%	58.3%	2.3%	5.4%	100.0%

Sources for Passenger Count Statistics (number of passengers getting on and off trains at station):

1. Penn Central System Passenger Service Study (November 15-21, 1970).
2. Central Railroad of New Jersey Study (November 15-21, 1970). Obtained from N. J. DOT for CNJ passengers at Newark.
3. Penn Central estimates of PATH, bus and subway passengers at Newark.
4. SEPTA Area Commuter Study (May 18-24, 1970).

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Station Cleaning Expense to Studied Passenger Service

<u>Major Station</u>	1970 Expense Applicable to <u>Station</u>	Percent Applicable to <u>Conventional Studied Trains*</u>	Expense Allocated to <u>Conventional Studied Trains</u>	Percent Applicable to <u>Metroliners*</u>	Expense Allocated to <u>Metroliners</u>
Penn Central, New York	\$ 391,887	28.9%	\$ 113,255	6.4%	\$ 25,081
Newark	57,299	4.8	2,750	.4	229
Trenton**	-	-	-	-	-
North Philadelphia	38,946	64.3	25,042	-	-
30th Street, Philadelphia	221,871	27.4	60,793	8.0	17,750
Wilmington	70,322	45.2	31,786	17.6	12,377
Baltimore	<u>89,800</u>	58.3	<u>52,353</u>	34.0	<u>30,532</u>
Total	<u>\$ 870,125</u>		<u>\$ 285,979</u>		<u>\$ 85,969</u>

\*Exhibit III-6. Studied train passenger utilization of station.  
\*\*Station cleaning expense reimbursed by State of New Jersey.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Station Utilities Expense to Studied Passenger Service

<u>Major Station</u>	1970 Expense Applicable to Station	Regional Maintenance Overhead Factor**	Total 1970 Expense Applicable to Station	Percent Applicable to Conventional Studied Trains*	Expense Allocated to Conventional Studied Trains	Percent Applicable to Metroliners*	Expense Allocated to Metroliners
Penn Central, New York							
Heating	\$ 509,725	1.0240 (M of E)	\$ 521,958				
Electricity	355,388	- -	355,388				
Water and Sewage	72,741	1.3461 (M of W)	<u>97,917</u>				
Total			\$ 975,263	28.9%	\$ 281,851	6.4%	\$ 62,417
Newark							
Heating	\$ 129,589	1.0240 (M of E)	\$ 132,699				
Electricity	30,721	1.3461 (M of W)	41,354				
Water and Sewage	12,208	1.3461 (M of W)	<u>16,433</u>				
Total			\$ 190,486	4.8	9,143	.4	762
30th Street, Philadelphia							
Heating	\$ 94,218	1.0240 (M of E)	\$ 96,479				
Electricity	87,567	1.0240 (M of E)	89,669				
Water and Sewage	14,733	1.3461 (M of W)	<u>19,832</u>				
Total			\$ 205,980	27.4	56,439	8.0	16,478
Baltimore							
Heating	\$ 60,907	1.3461 (M of W)	\$ 81,987				
Electricity	50,169	1.3461 (M of W)	<u>67,532</u>				
Total			\$ 149,519	58.3	<u>87,170</u>	34.0	<u>50,836</u>
Total All Stations	<u>\$ 1,417,966</u>		<u>\$ 1,521,248</u>		<u>\$ 434,603</u>		<u>\$ 130,493</u>

Note: Trenton (all utilities), North Philadelphia (all utilities), Wilmington (all utilities), and Baltimore (water and sewage) allocated to appropriate station responsibility centers through PC's accounting system.

\*Exhibit III-6. Studied train passenger utilization of station.

\*\*Source: Eastern Region Financial Statement, December, 1970 (Maint. of Eqpt. Admin.); Exhibit VII-1.3 (Maint. of Way and Structure Overhead).

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Exhibit III-9

Allocation of Station Maintenance Expense to Studied Passenger Service

<u>Major Station</u>	<u>1970 Expense</u> <u>Applicable</u> <u>to Station</u>	<u>Regional</u> <u>Maintenance</u> <u>Overhead</u> <u>Factor**</u>	<u>Total</u> <u>1970 Expense</u> <u>Applicable</u> <u>to Station</u>	<u>Percent</u> <u>Applicable to</u> <u>Conventional</u> <u>Studied Trains*</u>	<u>Expense</u> <u>Allocated to</u> <u>Conventional</u> <u>Studied Trains</u>	<u>Percent</u> <u>Applicable to</u> <u>Metroliners*</u>	<u>Expense</u> <u>Allocated to</u> <u>Metroliners</u>
<b>Penn Central, New York</b>							
Station Equipment Maintenance	\$ 113,386	1.0240 (M of E)	\$ 116,107				
Station Structure Maintenance	372,794	1.3461 (M of W)	<u>501,818</u>				
Total			\$ 617,925	28.9%	\$ 178,580	6.4%	\$ 39,547
<b>Newark</b>							
Station Equipment Maintenance	\$ 107,537	1.0240 (M of E)	\$ 110,118				
Station Structure Maintenance	69,326	1.3461 (M of W)	<u>93,320</u>				
Total			\$ 203,438	4.8	9,765	.4	814
<b>Trenton</b>							
Station Equipment Maintenance	\$ 625	1.0240 (M of E)	\$ 640				
Station Structure Maintenance	4,186	1.3461 (M of W)	<u>5,635</u>				
Total			\$ 6,275	66.4	4,167	2.0	126
<b>North Philadelphia</b>							
Station Equipment Maintenance	\$ 10,962	1.0240 (M of E)	\$ 11,225				
Station Structure Maintenance	1,290	1.3461 (M of W)	<u>1,736</u>				
Total			\$ 12,961	64.3	8,334	-	-
<b>30th Street, Philadelphia</b>							
Station Equipment Maintenance	\$ 89,902	1.0240 (M of E)	\$ 92,060				
Station Structure Maintenance	8,401	1.3461 (M of W)	<u>11,309</u>				
Total			\$ 103,369	27.4	28,323	8.0	8,270
<b>Wilmington</b>							
Station Equipment Maintenance	\$ 22,829	1.0240 (M of E)	\$ 23,377				
Station Structure Maintenance	19,397	1.3461 (M of W)	<u>26,110</u>				
Total			\$ 49,487	45.2	22,368	17.6	8,710
<b>Baltimore</b>							
Station Equipment Maintenance	\$ 53,069	1.0240 (M of E)	\$ 54,343				
Station Structure Maintenance	32,871	1.3461 (M of W)	<u>44,248</u>				
Total			\$ 98,591	58.3	57,479	34.0	33,521
Total All Stations	<u>\$ 906,575</u>		<u>\$ 1,092,046</u>		<u>\$ 309,016</u>		<u>\$ 90,988</u>

\*Exhibit III-6. Studied train passenger utilization of Station.

\*\*Eastern Region Financial Statement, December 1970 (Maintenance of Eqpt. Admin.); Exhibit VII-1.3 (Maint. of Way and Structures Overhead).

FULLY ALLOCATED COST OF NEW YORK - WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Conventional Cars Utilizing Washington Terminal - 1970

Engines		11,490	
Total Cars Using Station	137,029		
Less: Metroliners	<u>24,932</u>		
Total Conventional Cars		112,097	
Cars Diverted Within WTC		<u>7,349</u>	
Total Conventional Cars and Locomotives Using WTC in 1970		<u>130,936</u>	
Cars and Locomotives in Studied Conventional Service Utilizing WTC		<u>56,599</u>	
Total Conventional Cars and Locomotives Utilizing WTC	=	<u>130,936</u>	= 43.23%

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Washington Terminal Company Expenses  
Allocated to Studied Services - 1970

WTC Expense Applicable to Northeast Corridor Project (Metroliners). 1		\$ 808,038
Conventional Service WTC Charges to Penn Central. 2	\$ 4,534,569	
Percent Applicable to Studied Conventional Service	<u>.4323</u>	
WTC Expense Applicable to Studied Conventional Service		<u>1,960,294</u>
Total WTC Joint Facility Charge Applicable to Total Studied Service		<u>\$ 2,768,332</u>

1. Source: Northeast Corridor Project WT-19 bills for 1970.
2. Source: WT-19 bills for 1970.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Train and Engine Crew Expense - 1970

<u>Type Service</u>	<u>DCWE</u> <u>&amp; OSWE</u>	<u>FBE</u> <u>(.2546 x DCWE</u> <u>+ OSWE)</u>	<u>RWA</u> <u>(.06 x DCWE+OSWE)</u>	<u>Total</u>
New York - Washington Conventional	\$ 3,048,827	776,231	182,929	4,007,987
New York - Philadel- phia Conventional	1,183,973	301,440	71,038	1,556,451
Philadelphia - Washing- ton Conventional	<u>63,089</u>	<u>16,062</u>	<u>3,785</u>	<u>82,936</u>
Total Studied Conventional Service				<u>5,647,374</u>
New York - Washington Metroliner	700,522	178,353	42,031	920,906
Shop Train - Metroliner	<u>39,901</u>	<u>10,158</u>	<u>2,393</u>	<u>52,452</u>
Total Metroliner				<u>973,358</u>
Total Train and Engine Crew Expense for Studied Service				<u>\$ 6,620,732</u>



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Parlor Car and Coach Attendant  
Wage Expense - 1970

	<u>Coach</u> <u>Attendants</u>	<u>Parlor Car</u> <u>Attendants</u>	<u>Parlor Lounge</u> <u>Attendants</u>
Direct Labor Expense	\$ 141,258	77,746	489,613
Fringe Benefit Expense (.2546 of Direct Labor Expense)	<u>35,964</u>	<u>19,794</u>	<u>124,655</u>
Direct Wage Expense	177,222	97,540	614,268
RWA (.06 of Direct Labor Expense)	<u>8,475</u>	<u>4,665</u>	<u>29,377</u>
Sub Total	185,697	102,205	643,645
Dining Car Department Overhead (.3016 of Direct Wage Expense)	<u>53,450</u>	<u>29,418</u>	<u>185,263</u>
Total Wage Expense and Overhead	239,147	131,623	828,908
Percent Applicable to All Studied Trains	<u>.3125</u>	<u>.3195</u>	<u>.9751</u>
Expense Applicable to Studied Trains	74,733	42,054	808,268
Percent Applicable to Non-Food Service	<u>1.00</u>	<u>1.00</u>	<u>.53</u>
Expense Applicable to Studied Trains Non-Food Service	74,733	42,054	428,382
Percent Applicable to Metroliner Service	<u>0</u>	<u>0</u>	<u>.5581</u>
Parlor & Coach Attendant Expense Applicable to Metroliner Non- Food Service	<u>-</u>	<u>-</u>	\$ <u>239,080</u>
Parlor & Coach Attendant Expense Applicable to Studied Conventional Train Non-Food Service	<u>\$ 74,733</u>	<u>42,054</u>	<u>189,302</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Train Crew Wage Expense - 1970

	Studied Conventional <u>Service</u>	<u>Metroliner</u>
Train and Engine Crew	\$ 5,647,374	920,906
Metroliner Shop Train	-	52,452
Coach and Parlor Car Attendants (Non-Food Service)	<u>306,089</u>	<u>239,080</u>
Total Train Crew Wage Expense	<u>\$ 5,953,463</u>	<u>1,212,438</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Equated Cost of Electric Power - Studied  
Conventional Service - 1970

<u>Month - 1970</u>	<u>Car<sup>1</sup> Miles</u>	<u>Monthly<sup>1</sup> Factor</u>	<u>Rate<sup>3</sup></u>	<u>Total Cost</u>
January	1,443,969	3.50	.0156	\$ 78,841
February	1,312,884	3.50	.0166	76,279
March	1,523,219	3.33	.0155	78,621
April	1,512,794	3.33	.0160	80,602
May	1,538,486	3.20	.0155	76,309
June	1,468,171	3.20	.0168	78,929
July	1,565,669	3.20	.0170	85,172
August	1,489,350	3.20	.0160	76,255
September	1,411,522	3.20	.0172	77,690
October	1,394,939	3.20	.0175	78,117
November	1,366,538	3.33	.0172	78,270
December	1,415,301	3.50	.0172	<u>85,201</u>
Total				\$ <u>950,286</u>

1. Does not include South through-car service, head-end cars, or Pullman cars.
2. Kilowatt hours consumed for an average train per car-mile.
3. Cost of electricity in cents per kilowatt-hour.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Equated Cost of Electric Power -  
Metroliners 1970

<u>Month - 1970</u>	<u>Car Miles</u>	<u>Monthly Factor</u> <sup>1</sup>	<u>Rate</u> <sup>2</sup>	<u>Total Cost</u>
January	395,270	8.09	.0156	\$ 49,885
February	432,579	8.09	.0166	58,093
March	466,838	7.96	.0155	57,598
April	452,021	7.59	.0160	54,893
May	464,747	7.67	.0155	55,251
June	448,040	7.67	.0168	57,733
July	495,999	7.71	.0170	65,011
August	501,276	7.71	.0160	61,837
September	524,256	7.67	.0172	69,162
October	537,486	7.59	.0175	71,392
November	527,836	7.96	.0172	72,267
December	529,203	8.09	.0172	<u>73,638</u>
Total				\$ <u><u>746,760</u></u>

1. Kilowatt hours consumed per average train per car-mile.
2. Cost of electricity in cents per kilowatt-hour.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Indirect Propulsion Expense  
Allocable to Studied Conventional Service

<u>Road Power Purchased For Studied Conventional Service</u>	=	<u>950,286</u>	=	.4069
Total Conventional Road Passenger Power - Eastern Region <sup>1</sup>		2,335,308		

Passenger Indirect Power Expense		
Fuel-steam heating for electric locomotives	\$ 287,470	
Train communications equipment rental	68,546	
Passenger Yard Power Expense		
Diesel fuel for switching engines	<u>48,266</u>	
Total Indirect Propulsion Expense	404,282	
Percent Applicable to Studied Conventional Service	<u>.4069</u>	
Indirect Propulsion Expense Applicable to Studied Conventional Service	\$ <u>164,502</u>	

1. Includes New Jersey Division 1/1/71 - 3/31/71

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Electric Power Expense Summary

	<u>Direct</u> <u>Power</u> <u>Expense</u>	<u>Indirect</u> <u>Power</u> <u>Expense</u>	<u>Total</u> <u>Power</u> <u>Expense</u>
Studied Conventional Trains	950,286	164,502	\$ 1,114,788
Metroliners	746,760	-	<u>746,760</u>
Total Studied Trains			\$ <u><u>1,861,548</u></u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Block Station Expense  
New Jersey Division - 1970

<u>Block Station</u>	(1) Frequency of Total <u>Traffic</u>	(2) Frequency of Studied Conventional <u>Trains</u>	(3) Frequency of <u>Metroliners</u>	(4) Percent of Traffic of Studied Conventional <u>Trains</u>	(5) Percent of Traffic of <u>Metroliners</u>	(6) Total Expense <u>1970</u>	(7) Allocated to Studied Conventional <u>Trains</u>	(8) Allocated to <u>Metroliners</u>
Q & R	53,860	11,651	1,122	21.6%	2.1%	\$ 88,427	19,100	1,857
F	63,738	11,651	1,122	18.3	1.8	45,700	8,363	823
JO	53,864	2,853	-	5.3	-	67,344	-	-
A	55,478	14,760	4,274	26.6	7.7	192,954	51,326	14,857
Portal	62,480	14,760	4,274	23.6	6.8	43,421	10,247	2,953
Hudson	72,005	14,760	4,274	20.5	5.9	49,014	10,048	2,892
Dock	90,379	14,760	4,274	16.3	4.7	125,346	20,431	5,891
Hunter	95,199	14,760	4,274	15.5	4.5	68,370	10,597	3,077
Lane	58,452	14,760	4,274	25.3	7.3	47,128	11,923	3,440
Elmora	78,852	14,760	4,274	18.7	5.4	47,827	8,944	2,583
Union	90,863	14,760	4,274	16.2	4.7	71,534	11,589	3,362
Lincoln	63,820	14,760	4,274	23.1	6.7	47,611	10,998	3,190
County	64,977	14,760	4,274	22.7	6.6	47,785	10,847	3,154
Midway	51,253	14,760	4,274	28.8	8.3	45,152	13,004	3,748
Nassau	68,871	14,760	4,274	21.4	6.2	44,817	<u>9,591</u>	<u>2,779</u>
Total New Jersey Division							<u>\$ 207,008</u>	<u>54,606</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Block Station Expense  
Philadelphia Division / PCA - 1970

<u>Block Station</u>	(1) Frequency of Total Traffic	(2) Frequency of Studied Conventional Trains	(3) Frequency of Metroliners	(4) Percent of Traffic of Studied Conventional Trains	(5) Percent of Traffic of Metroliners	(6) Total Expense 1970	(7) Allocated to Studied Conventional Trains	(8) Allocated to Metroliners
Millham	53,787	14,760	4,274	27.4%	8.0%	\$ 50,410	13,812	4,033
Fair	74,483	14,760	4,274	19.8	5.7	66,761	13,218	3,805
Morris	74,003	14,760	4,274	19.9	5.8	62,507	12,439	3,625
Grundy	51,054	14,760	4,274	28.9	8.4	45,126	13,041	3,791
Holmes	52,289	14,760	4,274	28.2	8.2	44,747	12,619	3,669
Shore	75,031	14,760	4,274	19.7	5.7	48,545	9,563	2,767
North Philadelphia	88,168	14,760	4,274	16.7	4.9	71,122	11,877	3,485
Zoo	194,015	14,760	4,274	7.6	2.2	173,285	13,170	3,812
Penn	31,529	14,760	4,443	46.8	14.1	92,446	43,265	13,035
Arsenal	87,457	7,881	4,361	9.0	5.0	70,813	6,373	3,541
Brill	46,266	7,881	4,361	17.0	9.4	45,818	7,789	4,307
Baldwin	45,577	7,881	4,361	17.3	9.6	45,641	7,896	4,382
Lamakin	47,475	7,881	4,361	16.6	9.2	46,191	7,668	4,250
Hook	59,801	7,881	4,361	13.2	7.3	44,299	5,847	3,234
Bell	44,362	7,881	4,361	17.8	9.8	46,755	8,322	4,582
Wilmington	59,809	7,881	4,467	13.2	7.5	52,362	<u>6,912</u>	<u>3,927</u>
Total Philadelphia Division / PCA Expense							\$ <u>193,811</u>	<u>70,245</u>



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Block Station Expense  
Chesapeake Division - 1970

<u>Block Station</u>	(1) Frequency of Total Traffic	(2) Frequency of Studied Conventional Trains	(3) Frequency of Metroliners	(4) Percent of Traffic of Studied Conventional Trains	(5) Percent of Traffic of Metroliners	(6) Total Expense 1970	(7) Allocated to Studied Conventional Trains	(8) Allocated to Metroliners
Davis	42,181	7,881	4,467	18.7%	10.6%	\$ 48,425	9,055	5,133
Perryville	36,484	7,881	4,467	21.6	12.2	51,873	11,205	6,329
Edgewood	31,553	7,881	4,467	25.0	14.2	49,753	12,438	7,065
Bay	68,718	7,881	4,467	11.5	6.5	52,832	6,076	3,434
Union Junction	59,978	7,881	4,467	13.1	7.4	48,159	6,309	3,564
B & P Junction	69,715	7,881	4,465	11.3	6.4	50,335	5,688	3,221
Gwynns	43,791	7,881	4,465	18.0	10.2	47,111	8,480	4,805
Odenton	38,886	7,881	4,465	20.3	11.5	47,860	9,716	5,504
Bowie	29,240	7,881	4,465	27.0	15.3	47,636	12,862	7,288
Landover	36,749	7,881	4,465	21.4	12.2	51,867	<u>11,100</u>	<u>6,328</u>
Total Chesapeake Division							\$ <u>92,929</u>	<u>52,671</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Block Station Expense Summary

<u>Division</u>	Studied Conventional <u>Trains</u>	<u>Metroliner</u>
New Jersey	\$ 207,008	54,606
Philadelphia/PCA	193,811	70,245
Chesapeake	<u>92,929</u>	<u>52,671</u>
Total Block Station Expense	\$ <u>493,748</u>	<u>177,522</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

New Jersey - Division Operator Expense - 1970

Block Station Expense Applicable to Studied <u>Conventional Passenger Service</u>	=	<u>207,008</u>	=	.1222
Total New Jersey Division Block Station Expense		1,694,000		

Block Station Expense Applicable to <u>Metroliner Service</u>	=	<u>54,606</u>	=	.0322
Total New Jersey Division Block Station Expense		1,694,000		

New Jersey - Division Operator Expense	\$ 376,770
Percent Applicable to Studied Conventional Service	<u>.1222</u>

New Jersey - Division Operator Expense Allocable to Studied Conventional Service	\$ <u>46,041</u>
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New Jersey Division Operator Expense	\$ 376,770
Percent Applicable to Studied Conventional Service	<u>.0322</u>

New Jersey Division Operator Expense Allocable to Metroliner Service	\$ <u>12,132</u>
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FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Philadelphia Division/PCA  
Division Operator Expense - 1970

Block Station Expense Applicable To			
<u>Studied Conventional Passenger Service</u>	=	<u>193,811</u>	= .1272
Total Philadelphia Division and PCA		1,523,390	
Division Operator Expense			

Block Station Expense Applicable To			
<u>Metroliner Service</u>	=	<u>70,245</u>	= .0461
Total Philadelphia Division and PCA		1,523,390	
Division Operator Expense			

Philadelphia Division and PCA		
Division Operator Expense	\$	957,013

Percent Applicable to Studied		
Conventional Service		<u>.1272</u>

Philadelphia and PCA Division		
Operator Expense Allocable to		
Studied Conventional Service	\$	<u>121,732</u>

Philadelphia Division and PCA Division		
Operator Expense	\$	957,013

Percent Applicable to Metroliner Service		<u>.0461</u>
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Philadelphia Division and PCA Division		
Operator Expense Applicable to		
Metroliner Service	\$	<u>44,118</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Chesapeake - Division Operator Expense - 1970

Block Station Expense Applicable To <u>Studied Conventional Service</u>	=	<u>92,929</u>	=	.0937
Total Chesapeake Division Block Station Expense		992,000		

Block Station Expense Applicable To <u>Metroliner Service</u>	=	<u>56,671</u>	=	.0571
Total Chesapeake Division Block Station Expense		992,000		

Chesapeake Division Operator Expense \$ 497,873

Percent Applicable to Studied  
Conventional Service .0937

Chesapeake Division Operator  
Expense Allocable to Studied  
Conventional Service \$ 46,651

Chesapeake Division Operator Expense \$ 497,873

Percent Applicable to Metroliner Service .0571

Chesapeake Division Operator Expense  
Allocable to Metroliner Service \$ 28,429

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Division Operator Expense Summary

<u>Division</u>	Studied <u>Conventional Trains</u>	<u>Metroliners</u>
New Jersey	\$ 46,041	12,132
Philadelphia/PCA	121,732	44,118
Chesapeake	<u>46,651</u>	<u>28,429</u>
Total Division Operator Expense Allocated to Studied Service	\$ <u>214,424</u>	<u>84,679</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Assistant Superintendent of Transportation -  
Passenger Services - 1970

<u>Train-Miles - Studied Conventional Trains</u>	=	<u>2,353,283</u>	=	.2942
Passenger-Train-Miles - Eastern Region		7,997,608		

<u>Train-Miles - Studied Metroliners</u>	=	<u>963,000</u>	=	.1204
Passenger-Train-Miles - Eastern Region		7,997,608		

Assistant Superintendent of Transportation - Passenger Services	
New Jersey Division	\$ 324,920
Philadelphia Division	62,643
Chesapeake Division	<u>123,010</u>

Total Assistant Superintendent of Transportation - Passenger Services	510,573
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Ratio of Studied Conventional Train Miles to total passenger train miles - Eastern Region	<u>.2942</u>
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Assistant Superintendent of Transportation Passenger Services Allocable to Studied Conventional Trains	<u>\$150,211</u>
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Total Assistant Superintendent of Transporta- tion Passenger Services	\$ 510,573
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Rates of Train Miles Metroliners to total passenger train Miles - Eastern Region	<u>.1204</u>
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Assistant Superintendent of Transportation - Passenger Services Allocable to Studied Metroliners	<u>\$ 61,473</u>
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FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Yard and Switching Expense - 1970

Penn Central Station - New York City

Superintendent of Operations	\$ 163,611
Train and Engine	<u>1,325,936</u>
Total Penn Station Yard and Switching Expense	1,489,547
Percent Allocable to Studied Conventional Service	<u>.1691</u>
Penn Station Yard and Switching Expense Allocable to Conventional Service	\$ <u>251,882</u>
Total Penn Station Yard and Switching	\$ 1,489,547
Percent Allocable to Metroliner Service	<u>.0312</u>
Penn Station Yard and Switching Expense Allocable to Metroliners	\$ <u>46,474</u>

Sunnyside Yard

Passenger Trainmaster	\$ 29,586
Train and Engine	<u>1,077,119</u>
Total Sunnyside Yard and Switching Expense	1,106,705
Percent Applicable to Studied Conventional Service	<u>.2160</u>
Sunnyside Yard and Switching Expense Allocable to Studied Conventional Service	\$ <u>239,048</u>
Total Sunnyside Yard and Switching Expense	\$ 1,106,705
Percent Applicable to Metroliner Service	<u>.0211</u>
Sunnyside Yard and Switching Expense Allocable to Metroliner Service	\$ <u>23,351</u>

(Continued)



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Yard and Switching Expense - 1970

Penn Coach Yard

Trainmaster	\$ 27,553
Train and Engine	975,985
Cleaning Expense. 1.	56,175
Other. 2.	<u>15,540</u>
Total Penn Coach Yard and Switching Expense	1,075,253
Ratio of Number of Men Switching Cars in Studied Conventional Service to Total Number of Men Dispatched for Switching in Penn Coach Yard	<u>.8216</u>
Penn Coach Yard and Switching Expense Allocable to Studied Conventional Service	<u>\$ 883,428</u>

1. Formerly Superintendent of Buildings, Philadelphia Division.
2. Miscoded to 30th St. Stationmaster responsibility center.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Yard and Switching Expense Summary

<u>Location</u>	<u>Studied Conventional Service</u>	<u>Metroliners</u>
Pennsylvania Station - New York City	\$ 251,882	46,474
Sunnyside Coach Yard	239,048	23,351
Penn Coach Yard	<u>883,428</u>	<u>-</u>
Total Yard and Switching Expense Allocable to Studied Services	\$ <u>1,374,358</u>	<u>69,825</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Crew Dispatcher - Philadelphia Division

Crew Dispatcher	
Philadelphia Division	\$ 288,993
Philadelphia Commuter Authority	<u>72,195</u>
Total Crew Dispatcher Expense - 1970	<u>\$ 361,188</u>
Total Crew Dispatcher Personnel	27 - 1.00
- Assigned to Yard and Freight Dispatching	16 - .593
- Assigned to Passenger Dispatching	11 - .407
<u>Number of Men Dispatched Daily for Studied Trains</u>	<u>43</u>
Number of Men Dispatched Daily by Passenger Crew Dispatcher	371 = .116
Total Crew Dispatcher Expense	\$ 361,188
Percent Allocable to Passenger Dispatching	<u>.407</u>
Passenger Dispatching Expense	147,004
Percent Allocable to Studied Conventional Service	<u>.116</u>
Passenger Dispatching Expense Allocated to Studied Conventional Service	<u>\$ 17,052</u>
<u>Number of Men Dispatched Daily for Switching for Studied Conventional Service</u>	<u>31</u>
Number of Men Dispatched Daily by Freight Crew Dispatcher	580 = .0534
Total Crew Dispatcher Expense	\$ 361,188
Percent Allocable to Yard and Freight Dispatching	<u>.593</u>
Yard and Freight Dispatching Expense	\$ 214,184
Percent Allocable to Studied Conventional Service	<u>.0534</u>
Yard and Freight Dispatching Expense Allocated to Studied Conventional Service	<u>\$ 11,437</u>
Passenger Crew Dispatching Expense	\$ 17,052
Freight Crew Dispatching Expense	<u>11,437</u>
Crew Dispatching Allocable to Studied Conventional Train Service	<u>\$ 28,489</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Transportation Administrative Expense

Eastern Region		
General Superintendent	\$	824,110
New Jersey Division		
Assistant Superintendent - Motive Power		202,744
Superintendent Train Movement		329,619
Philadelphia Division		
Superintendent - Transportation		1,855,539
Division - Road Foreman		151,854
Chesapeake Division		
Transportation Superintendent		747,545
Division Road Foreman		72,235
Supervisor Train Operations		<u>497,873</u>
Transportation Administrative Expense	\$	<u><u>4,681,519</u></u>
Total Transportation Expense - Eastern Region	\$	139,578,000
Less: Transportation Administrative Expense		<u>4,681,519</u>
Direct Transportation Expense	\$	<u><u>134,896,481</u></u>
$\frac{\text{Transportation Administrative Expense}}{\text{Direct Transportation Expense}} = \frac{4,681,519}{134,896,481} = .0347$		
Transportation Expense Directly Allocable to Studied Conventional Service*	\$	9,023,392
Ratio of Transportation Administrative to Direct Transportation Expense		<u>.0347</u>
Transportation Administrative Expense Allocable to Studied Conventional Service	\$	<u><u>313,112</u></u>
Transportation Expense Directly Allocable to Metroliner Service*	\$	2,113,617
Ratio of Transportation Administrative to Direct Transportation Expense		<u>.0347</u>
Transportation Administrative Expense Allocable to Metroliner Service	\$	<u><u>73,343</u></u>

\*Less Dining Car Department Expense.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Direct Maintenance of Equipment Expense  
Studied Conventional Service - 1970

	<u>Electric Locomotives</u>	<u>Locomotive Propelled Cars</u>
Repairs and Inspection	\$ 8,499,572	22,041,551
Lubricants and Other Supplies	268,860	-
Enginehouse Expense	562,830	-
Other Train Supplies and Expense	-	13,291,799
Payroll Taxes	429,571	2,874,945
Health and Welfare Benefits	<u>198,189</u>	<u>1,326,400</u>
Total	<u>\$ 9,959,022</u>	<u>39,534,695</u>
Electric locomotive-miles	12,890,292	
Passenger car miles		160,419,751
Direct cost factor	<u>\$ .7726</u>	<u>.2464</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Indirect Maintenance  
of Equipment Expenses

<u>Expense Category</u>	(1) Indirect Expenses to be Allocated	(2) Direct Operating Expenses	(3) Expenses Not Bearing Overhead Allocation
<u>Maintenance of Equipment Expenses</u>			
Superintendence	\$ 10,578,726		
Shop Machinery Repair	2,880,780		
Power Plant Machinery Repair	2,344,920		
Depreciation of Shop and Power Plant Machinery	1,638,339		
Dismantling Retired Shop and Power Plant Machinery	6,749		
Locomotive Repairs		100,524,408	
Freight Car Repairs		86,146,998	
Passenger Car Repairs		39,405,103	
Floating Equipment Repairs		998,643	
Work Equipment Repairs	2,597,689		
Miscellaneous Equipment Repairs	1,067,872		
Equipment Depreciation			62,340,684
Dismantling Retired Equipment	101,461		
Equipment Retirements			(638,324)
Injuries to Persons	2,367,102		
Insurance	1,271,131		
Stationery and Printing	281,152		
Employee Health and Welfare Benefits			9,236,133
Other Expenses	3,325,522		
Joint Maintenance of Equipment	957,641		

Other Expenses of Maintenance of Equipment  
Responsibility Centers

Train Supplies and Expenses		44,888,414	
Lubricants for Locomotives		2,508,279	
Other Supplies for Locomotives		797,018	
Enginehouse Expenses		9,881,355	
	\$ 29,419,084	285,150,218	70,938,493

Ratio: Indirect/Direct =  $\frac{29,419,084}{285,150,218} = \underline{\underline{.1032}}$

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Equipment Capital Cost Factor  
Studied Conventional Service - 1970

	<u>Electric</u> <u>Locomotives</u>	<u>Locomotive</u> <u>Propelled Cars</u>
Depreciation Expense	\$ 1,336,065	2,468,500
System Electric Locomotive-Miles	12,890,292	
System Passenger-Car-Miles	<u>                    </u>	<u>146,390,823</u>
Equipment Capital Cost Factor	\$ <u>.1036</u>	<u>.0169</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Maintenance of Equipment Cost  
Studied Conventional Service - 1970

	<u>Electric</u> <u>Locomotives</u>	<u>Locomotive</u> <u>Propelled Cars</u>
Direct Maintenance Cost Factor	.7726	.2464
Indirect Expense Factor @ .1032	<u>.0797</u>	<u>.0254</u>
Total Maintenance Cost Factor	.8523	.2718
Locomotive-Miles, Studied Service	2,428,862	
Passenger-Car-Miles, Studied Service	<u>                    </u>	<u>17,186,831</u>
	2,070,119	4,671,381
System Overhead	<u>215,913</u>	<u>487,121</u>
Total Maintenance Cost, Studied Service	\$ <u>2,286,032</u>	<u>5,158,502</u>
Equipment Capital Cost Factor	.1036	.0169
Locomotive-Miles, Studied Service	2,428,862	
Passenger-Car-Miles, Studied Service	<u>                    </u>	<u>17,186,831</u>
	251,630	290,457
System Overhead	<u>26,245</u>	<u>30,295</u>
Total Capital Cost, Studied Service	\$ <u>277,875</u>	<u>320,752</u>



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Metroliner Maintenance of Equipment Cost - 1970

Washington Terminal	\$ 839,441
Wilmington Heavy Repair Shop	2,283,300
Other PC Maintenance of Equipment Center Costs	435,763
Northeast Corridor Coordinator Task Force	302,561
Technical Support Fees	473,923
Insurance on Metroliner Cars	<u>128,295</u>
Direct Metroliner Maintenance Expense	4,463,283
System Overhead	<u>465,520</u>
Total Metroliner Maintenance Expense	\$ <u>4,928,803</u>
Metroliner Capital Equipment Cost	\$ 1,412,077
Metroliner Equipment Modifications	<u>113,086</u>
Direct Metroliner Capital Costs	1,525,163
System Overhead	<u>159,075</u>
Total Metroliner Capital Costs	\$ <u>1,684,238</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Determination of Allocable Maintenance  
of Way and Structures Expense - 1970

	Total Maintenance of Way and Structures Expense	Less: Metroliner Incremental Expense	Less: Station Expense	Less: Non- Allocable Expense	Allocable Maintenance of Way and Structures Expense
Eastern Region					
Regional Engineer	\$ 386,620				386,620
Regional M. of W. Depreciation	10,350,000				10,350,000
Track	82,206				82,206
Communications and Signals	95,915				95,915
Electric Traction	87,880				87,880
Structure	63,854				63,854
New Jersey Division					
Chief Engineer	16,189				16,189
Track	3,685,513	113,502			3,572,011
Communications and Signals	1,826,706	255			1,826,451
Electric Traction	840,192				840,192
Structures	2,353,830		586,219		1,767,611
Philadelphia Division					
Chief Engineer	238,080				238,080
Track	5,345,582	50,467			5,295,115
Communications and Signals	1,968,658				1,968,658
Electric Traction	889,297	6,063			883,234
Structures	1,128,136		35,260		1,092,876
Chesapeake Division					
Chief Engineer	102,394				102,394
Track	4,171,676	88,941			4,082,735
Communications and Signals	1,355,888	20	34,473		1,321,395
Electric Traction	869,454	48	26,434		842,972
Structures	881,422		102,437		778,985
Harrisburg Division					
Chief Engineer	293,658				293,658
Track	4,743,782				4,743,782
Communications and Signals	1,465,742			1,465,742	-
Electric Traction	483,162				483,162
Structures	557,842				557,842
Total	\$ 44,283,678	259,296	784,823	1,465,742	41,773,817

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Allocation of Maintenance of Way and Structures Overhead and  
Non-Division Charges of New York Region to Maintenance of  
Way and Structures of New Jersey Division

<u>Month</u>	<u>Total New York Region Expense</u>	<u>Total Maintenance of Way and Structures Expenses</u>			
		<u>New York Region</u>	<u>Non- Divisional</u>	<u>New Jersey Division</u>	<u>Hudson Division</u>
January	\$ 15,021,000	2,524,000	184,000	1,216,000	1,124,000
February	14,160,000	2,057,000	140,000	1,082,000	835,000
March	<u>15,046,000</u>	<u>2,126,000</u>	<u>193,000</u>	<u>1,028,000</u>	<u>905,000</u>
Totals	\$ <u>44,227,000</u>	<u>6,707,000</u>	<u>517,000</u>	<u>3,326,000</u>	<u>2,864,000</u>

Total Maintenance of Way and Structures Expense, New York Region	\$ 6,707,000
Less: Maintenance of Way and Structures Expense, Non-Divisional	<u>517,000</u>
	<u>\$ 6,190,000</u>
Non-Divisional Maintenance of Way and Structures Overhead Factor (\$517,000 ÷ \$6,190,000)	<u>.0835</u>

<u>Expense Description</u>	<u>Maintenance of Way and Structures</u>		
	<u>New Jersey Division</u>	<u>Overhead Factor</u>	<u>New Jersey Division - Adjusted</u>
Track	\$ 1,501,133	1.0835	1,626,478
Communications and Signals	585,711	1.0835	634,618
Electric Traction	330,708	1.0835	358,322
Structures	<u>908,448</u>	1.0835	<u>984,303</u>
	\$ <u>3,326,000</u>		<u>3,603,721</u>

Source: New York Region Financial Statements, January, February, March, 1970.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Eastern Region Maintenance of Way and  
Structures Overhead Rate - 1970

Regional Engineer	\$ 386,620	
Region MofW&S Depreciation	10,350,000	
Chief Engineer - New Jersey Division	16,189	
Chief Engineer - Philadelphia Division	238,080	
Chief Engineer - Chesapeake Division	102,394	
Chief Engineer - Harrisburg Division	<u>293,658</u>	
Eastern Region MofW&S Overhead	<u>\$ 11,386,941</u>	
Total Eastern Region MofW&S Expense	\$ 44,283,678	
Less: Eastern Region MofW&S Overhead	<u>11,386,941</u>	
Eastern Region Direct MofW&S Expense	<u>\$ 32,896,737</u>	
Eastern Region MofW&S Overhead Factor	=	$\frac{11,386,941}{32,896,737} = \underline{\underline{.3461}}$

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Total Maintenance of Way and Structures  
Expense to be Allocated - 1970

	<u>Track</u>	<u>Communi- cations and Signals</u>	<u>Electric Traction</u>	<u>Structures</u>
Eastern Region	\$ 82,206	95,915	87,880	63,854
New Jersey Division	3,572,011	1,826,451	840,192	1,767,611
Philadelphia Division	5,295,115	1,968,658	883,234	1,092,876
Chesapeake Division	4,082,735	1,321,395	842,972	778,985
Harrisburg Division	<u>4,743,782</u>	<u>-</u>	<u>483,162</u>	<u>557,842</u>
Sub-total	17,775,849	5,212,419	3,137,440	4,261,168
MofW&S Overhead (.3461 x sub-total)	<u>6,152,221</u>	<u>1,804,018</u>	<u>1,085,868</u>	<u>1,474,790</u>
Distributed Eastern Region MofW&S Expense	23,928,070	7,016,437	4,223,308	5,735,958
New Jersey Division (1/1/70 - 3/31/70)	<u>1,626,478</u>	<u>634,618</u>	<u>358,322</u>	<u>984,303</u>
Total Maintenance of Way and Structures Expense to be Allocated	<u>\$ 25,554,548</u>	<u>7,651,055</u>	<u>4,581,630</u>	<u>6,720,261</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Gross Ton-Miles\*, Eastern Region  
Including New Jersey Division

	<u>Freight**</u>	<u>Passenger**</u>
January	1,918,376,000	471,005,000
February	2,012,722,000	442,164,000
March	2,264,527,000	471,164,000
April	2,241,603,000	457,997,000
May	2,406,609,000	456,038,000
June	2,061,354,000	438,373,000
July	2,029,754,000	450,969,000
August	2,203,914,000	446,583,000
September	2,148,952,000	422,079,000
October	2,352,518,000	434,878,000
November	2,078,402,000	426,370,000
December	<u>1,829,888,000</u>	<u>439,619,000</u>
Totals	25,548,619,000	5,357,239,000
	<u>5,357,239,000</u>	
Total Gross Ton-Miles	<u><u>30,905,858,000</u></u>	

\*Statistics obtained from regional I.C.C. Form OS-A, and Penn Central P-11 report.

\*\*Includes locomotives. Jan., Feb., Mar., Nov., Dec. locomotive gross-ton miles based on monthly average (April-October) due to unavailability of statistical data and to calculation errors.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Maintenance of Way and Structures Allocation Factors

Gross Ton-Mile Factor (GTMF):

<u>Gross Ton-Miles (Studied Conventional Passenger)</u>	<u>1,713,944,634</u>	=	.05546
Gross Ton-Miles (Eastern Region)	30,905,858,000		
<u>Gross Ton-Mile (Metroliners)</u>	<u>476,484,360</u>	=	.01542
Gross Ton-Miles (Eastern Region)	30,905,858,000		

Block Station Expense Factor (BSEF):

<u>Direct Block Station Expense (Studied Conventional Passenger)</u>	<u>493,748</u>	=	.11730
Direct Block Station Expense (N.J., Phila., Ches.)	4,209,390		
<u>Direct Block Station Expense (Metroliners)</u>	<u>181,522</u>	=	.04312
Direct Block Station Expense (N.J., Phila., Ches.)	4,209,390		

Electric Power Factor (EPF):

<u>Direct Electric Power Expense (Studied Conventional Passenger)</u>	<u>950,286</u>	=	.09975
Direct Electric Power Expense (Eastern Region)	9,526,659		
<u>Direct Electric Power Expense (Metroliners)</u>	<u>746,760</u>	=	.07839
Direct Electric Power Expense (Eastern Region)	9,526,659		

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Maintenance of Way and Structures Expenditure to  
be Charged Directly to Metroliner Service - 1970

MofW&S Expense. 1.:	
Track	\$ 252,910
Communications and Signals	20
Electric Traction	<u>6,366</u>
Total Direct MofW&S Expense	259,296
MofW&S Overhead (.3461)	<u>89,742</u>
Sub-total	349,038
Region Overhead (.0305)	<u>10,646</u>
Sub-total	359,684
System Overhead (.1043)	<u>37,515</u>
Total MofW&S Expense to be Charged Directly to Metroliner Service	397,199
Total Account 80 Expenditures Allowed as Direct Cost of Metroliner Operations	933,698
Total Accounts 1-47 Expenditures Allowed as Direct Cost of Metroliner Operations	<u>770,702</u>
Total Cost to be Charged Directly to Metroliner	<u>\$ 2,101,599</u>

1. See Appendix C for an explanation of these costs.



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Maintenance of Way and Structures Expense  
Studied Conventional Passenger Trains - 1970

<u>Type Expense</u>	MofW&S Expense to be <u>Allocated</u>	<u>Allocation Basis</u>	<u>Allocation Factor</u>	<u>Expense Allocated</u>
Track	\$ 25,554,548	Gross Ton-Miles Factor	.05546	\$ 1,417,257
Communications and Signals	7,651,055	Block Station Expense Factor	.11730	897,469
Electric Traction	4,581,630	Electric Power Factor	.09975	457,017
Structures	6,720,261	Gross Ton-Miles Factor	.05546	<u>372,706</u>
MofW&S Expense Allocated to Studied Conventional Passenger Service				3,144,449
Region Overhead (.0305)				<u>95,906</u>
Sub-total				3,240,355
System Overhead (.1043)				<u>337,969</u>
Total Maintenance of Way and Structures Expense Allocated to Studied Con- ventional Passenger Service				<u><u>\$ 3,578,324</u></u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Maintenance of Way and Structures Expense  
Metroliner Service - 1970

<u>Type Expense</u>	MofW&S Expense to be <u>Allocated</u>	<u>Allocation Basis</u>	<u>Allocation Factor</u>	<u>Expense Allocated</u>
Track	\$ 25,554,548	Gross Ton-Mile Factor	.01542	\$ 394,052
Communications and Signals	7,651,055	Block Station Expense Factor	.04312	329,913
Electric Traction	4,581,630	Electric Power Factor	.07839	359,154
Structures	6,720,261	Gross Ton-Mile Factor	.01542	<u>103,626</u>
MofW&S Expense Allocated to Metroliner Service				1,186,745
Region Overhead (.0305)				<u>36,196</u>
Sub-Total				1,222,941
System Overhead (.1043)				<u>127,553</u>
Total Maintenance of Way and Structures Expense Allocated to Metroliner Service				1,350,494
Expense to be Charged Directly to Metroliner Service				<u>2,101,599</u>
Total Maintenance of Way and Structures Expense to be Charged to Metroliner Service				<u>\$ 3,452,093</u>

30TH STREET STATION, PHILADELPHIA-ALLOCATION TECHNIQUE STUDY

For the purpose of allocating passenger station expenses, an in-depth study of 30th Street Station, Philadelphia was conducted. The objective of this study was to develop allocation techniques for passenger station expenses that would be more equitable than those currently available. These newly developed techniques would then be used to allocate costs at all passenger stations used by the studied trains operating between New York and Washington during 1970.

BACKGROUND

In order to identify the accounts containing charges applicable to 30th Street Station we analyzed the responsibility center reports, reviewed prior passenger station studies performed by Penn Central, held discussions with operating and accounting personnel and observed and studied station activities. As a result, we found the following general categories of accounts to be applicable to station expenses:

1. Ticket Sales and Service
2. Stationmaster
3. Station Cleaning
4. Station Utilities
5. Station Maintenance
6. Mail and Baggage

HOW WE PERFORMED  
THE STUDY

The following discussion describes our approach in conducting the study and the methods we used to develop the allocation techniques.

(a) Ticket Sales  
and Service

30th Street Station ticket sales and service reported to System Passenger Service prior to May, 1970. Following organization of the Philadelphia Commuter Area (PCA) service on May 1, 1970, this operation was transferred to the responsibility of the Superintendent of Suburban Stations (PCA).

Ticket sales and service primarily consists of two bureaus that provide different types of services. The Ticket Sales Bureau sells tickets to all points including stations in the SEPTA area, stations along the Northeast Corridor, other destinations within the Penn Central System, and destinations served by railroads connecting with PC. Reservations and Information, the second bureau, receives and acts upon incoming telephone inquiries from the metropolitan and suburban Philadelphia areas, which include calls in reference to all stations and to all of the trains operating in the Penn Central System. All other clerical, administrative and supervisory activities support the ticket selling operation and reservations and information operation.

Due to the difference in the type service performed by each bureau, ticket selling expenses were allocated to the studied passenger services separately from the allocation of the reservations and information expense. As shown in Exhibit A-1.1, the ratio of direct labor expense was developed and used to allocate net ticket sales and service expense between the ticket sales operation and the reservations and information operation. Direct labor expenses for ticket clerks and reservations and information clerks were obtained from the Passenger Station Operations Reports (Form PD-1). The expense associated with the Metroliner ticket reservations system was excluded from the above allocation and was considered a direct expense of Metroliner Service.

Studies of the ticket sales and service operations indicated that the workloads in each bureau were related to different variables. Ticket selling workload for each type of passenger service was related to the number of tickets sold, while the workload in the reservations and information bureau was related to the number of telephone calls received. The total workload in each bureau was a function of the volume of activity (i.e., number of tickets sold, or number of phone calls received) and the time required to perform each activity.

The most equitable method of allocating the expenses of each bureau is on the basis of percent of total workload devoted to the studied passenger services. Time studies were conducted at 30th Street Station to determine the average time to complete a ticket sales transaction and the average time to complete a reservation and information telephone call transaction. The average transaction time values that were developed were grouped into Metroliner, studied conventional train, and "other train" categories in order to calculate the relative workload devoted to the studied passenger services. The volume of activity for each bureau was developed through separate analyses as follows:

1. Ticket Sales. Statistics indicating the number of Metroliner tickets sold at 30th Street Station were available. However, no historical data were available pertaining to the number of studied conventional train tickets sold in relation to other tickets sold through the Burroughs Ticketeer machines. To determine the number of tickets sold by type of passenger service, we analyzed the Ticketeer sales journal tapes and Metroliner ticket sales reports for 1970, using a statistical sample consisting of 37,712 ticket sales transactions. The number of tickets sold for each type of passenger service was multiplied by the appropriate average ticket sales transaction time value to obtain the relative workload. Dividing the relative workload for each service by the total ticket selling workload for all passenger services yielded the percent of total workload devoted to the studied trains. These calculations are shown as follows:

	Studied			<u>Total</u>
	<u>Metroliners</u>	<u>Conventional Trains</u>	<u>Other Trains</u>	
Number of Tickets Sold	6,178	13,887	17,647	37,712
Percent of Total Tickets Sold	16.4%	36.8	46.8	100.0%
Ticket Sales Transaction Time Value (minutes)	.97	.52	.43	
Relative Workload (No. of tickets x Transaction Time Value)	5,993	7,221	7,588	20,802
Percent of Total Workload	28.8%	34.7	36.5	100.0%

2. Reservations and Information. Historical data were not available from which the number of telephone calls requesting Metroliner and studied conventional train reservations and information could be determined. Therefore, a survey was conducted for seven days during the week of February 19-25, 1971. Operations during this period were stipulated by PC management personnel to be similar to operations during 1970. As a result, the data obtained during this period were viewed as being representative of conditions that existed during 1970. Each operator at general reservations and information positions was asked to make a "stroke" count of the telephone calls received in reference to Metroliner and studied conventional trains. Since the total number of calls received at each position is metered, it was possible to determine the number of "other" calls by subtracting the stroke counts from the total calls. The number of Metroliner reservations and information phone calls at the "dedicated" Metroliner positions was determined from the number of Metroliner reservations made, which had a close correlation to the number of calls received. As shown in the table below, 24,282 reservations and information telephone calls were received by the bureau for the seven-day period. The number of reservation and information phone calls received for each type of passenger service was multiplied by the applicable average telephone call transaction time value to determine the relative workload. By dividing the relative workload for each passenger service by the total workload for all passenger services, the percent of total reservations and information workload devoted to the studied passenger services was determined.

	Studied			<u>Total</u>
	<u>Metroliners</u>	<u>Conventional Trains</u>	<u>Other Trains</u>	
Number of R & I Telephone Calls	6,334	8,832	9,116	24,282
Percent of Total Calls	26.1%	36.4	37.5	100.0%
R & I Phone Call Transaction Time Value (minutes)	1.20	1.43	1.95	
Relative Workload (No. of calls x Transaction Time Value)	7,601	12,630	17,776	38,007
Percent of Total Workload	<u>20.0%</u>	<u>33.2</u>	<u>46.8</u>	<u>100.0%</u>

The allocation of 30th Street Station ticket sales and service expense to the studied passenger services is included in Exhibit A-1.1.

(b) Stationmaster

During 1970, the 30th Street Stationmaster reported to the Assistant Superintendent - Passenger (Philadelphia Division) and was responsible for the station operations of the main concourse and the lower level, which included all intercity trains using the station. The upper level of 30th Street Station and commuter trains operations came under the responsibility of the Stationmaster at Suburban Station (Philadelphia Commuter Area).

The functions under the Stationmaster's responsibility include: train information; posting and announcing train arrivals and departures; assisting and directing passengers on and off trains; taking care of injured passengers; and providing Redcap service. Most of the work of the Stationmaster's department relates to and varies with the number of trains stopping at the station. Therefore, based on observations of these activities, the preferred method for allocating Stationmaster expense is on the basis of frequency of station utilization by the studied trains. The ratio of the number of stops per week for the studied trains to the total number of stops per week for all trains using the lower level at 30th Street Station was developed from the Eastern Region timetable. The results of this analysis are shown below and the allocation of Stationmaster expense based on this method is shown in Exhibit A-1.2.

Number of Stops Per Week - All Trains	442
Number of Stops Per Week - Studied Trains	376
Frequency of Station Utilization By Studied Trains	85.1%

(c) Station Cleaning

The Philadelphia Division Supervisor of Buildings furnished cleaning services to the 30th Street Station during the period January through May, 1970.

For the period June through December, 1970 these services were provided by the Supervisor of Suburban Station's cleaners (Philadelphia Commuter Area). The 1970 expense for cleaning services was developed from the cleaning labor and foremen costs charged to 30th Street Station product cost centers. The ratio of 30th Street Station's cleaning labor and foremen expense to the total expense for cleaning labor and foremen was used to allocate the remaining expenses contained in the responsibility centers to the station. These calculations are shown in Exhibit A-1.2.

Since 30th Street Station is a common facility available for use by all passengers, the most equitable way to allocate station cleaning expense to the studied passenger services is on the basis of passenger utilization of the station. Passenger on-and-off count statistics for each train stopping at 30th Street Station were developed from the Penn Central System Passenger Service Study (November 15-21, 1970) and the SEPTA Area Commuter Study (May 18-24, 1970). These studies were summarized in terms of the average number of passengers per week getting on and off trains at 30th Street Station by type of service. The percent of station utilization by Metroliner and studied conventional train passengers in relation to all other passengers was also developed and is shown in the following schedule. The SEPTA area passenger count statistics for the full week were available, but the System Passenger Service passenger count statistics were available only for Wednesday, November 18, Saturday, November 21, and Sunday, November 15. In order to develop the average weekly passenger count, the total passengers for Wednesday was multiplied by a factor of five and added to the Saturday and Sunday counts to approximate the weekly total results.



<u>Type of Service</u>	<u>Number of Passengers Per Week</u>	<u>Passenger Utilization of Station</u>
Metroliners	11,832	8.0%
Studied Conventional Trains	40,524	27.4
Other Intercity and Through Trains	1,581	1.1
Commuter Trains	<u>93,765</u>	<u>63.5</u>
Total	<u>147,702</u>	<u>100.0%</u>

The allocation of 30th Street Station cleaning expense to the studied trains appears in Exhibit A-1.2.

(d) Station Utilities

Heating and electricity expenses for 30th Street Station are contained in the General Maintenance Foreman's responsibility center (Maintenance of Equipment). The Supervisor of Structures' responsibility center (Maintenance of Way and Structures) contains the expense for water and sewage. Telephone expense is charged directly to the responsibility center incurring the expense.

Station utilities are furnished to the entire station. Therefore, the preferred method for allocating these expenses is on the basis of passenger utilization of the station. However, prior to allocating utilities expenses to the studied passenger services, as shown in Exhibit A-1.3, several special studies were conducted to determine the amount to be allocated to the station.

1. Heating. The total 1970 expense for heating (purchased steam) contained in the general maintenance responsibility center included expenses for the 30th Street location, Penn Coach Yard and Suburban Station. Each location was metered and billed separately by the utility company. Therefore, the expense allocable to the 30th Street location was obtained directly from the Eastern Region accounts payable records. At the 30th Street location, heating is furnished to the station, office building and concessions. Information regarding the steam consumed by each area was not available. This lack of data prompted the decision to allocate the 30th Street location heating expense between the station, office building and concessions based on relative square

feet of each area (see Exhibit A-1.3). These calculations were developed from the station and office building blueprints and are as follows:

<u>Area</u>	<u>Square feet</u>	<u>Percent of total area</u>
Station*	782,997	68.9%
Office building	269,644	23.7
Concessions	<u>84,303</u>	<u>7.4</u>
Total	<u>1,136,944</u>	<u>100.0%</u>

\*Station area includes the upper and lower level platforms. The main concourse area has been multiplied by a factor of eight to reflect the height of the structure.

2. Electricity. The total electricity expense for 1970, located in the general maintenance responsibility center, included expenses for the 30th Street location, Suburban Station, Penn Coach Yard, and other locations. These locations were all included on one bill from the utility company, thereby making it impossible to determine the 30th Street electricity expense from accounts payable records. Since historical records of electricity usage at various locations did not exist, a special study was conducted to determine these statistics. The kilowatt-hour meters, located at PC's 23rd Street substation, were read for a period of seven days (March 18-25, 1971). The relative electricity usage for each location was determined from these meter readings and was used to allocate the total 1970 expense between the various locations. A summary of the relative kilowatt-hour usage appears below and the allocation of electricity expense to the 30th Street location is included in Exhibit A-1.3.

	<u>Kilowatt Hours</u>	<u>Percent of Total KWH</u>
30th Street location	221,900	52.8%
Suburban Station	90,300	21.5
Penn Coach Yard and other Locations	<u>108,000</u>	<u>25.7</u>
Total	<u>420,200</u>	<u>100.0%</u>

The electricity expense for the 30th Street location was then allocated between the station, office building, and concessions on the basis of relative square feet of each area (see Exhibit A-1.3).

3. Water and Sewage. The water and sewage expense contained in the Supervisor of Structures' responsibility center included expenses for the 30th Street location, Penn Coach Yard and other locations. Each location is metered and billed separately by the water company. The expense allocable to the 30th Street location was determined from the Eastern Region accounts payable records. The expense allocable to 30th Street Station was determined on the basis of the relative area (square feet), as shown in Exhibit A-1.4.

(e) Station Maintenance

Maintenance of equipment within the station is the responsibility of the General Maintenance Foreman (Maintenance of Equipment). Station structure maintenance comes under the Supervisor of Structures' responsibility. The 1970 expenses for both equipment and structure maintenance were developed from the direct labor and foremen costs charged to 30th Street Station product cost centers and work orders. As shown in Exhibit A-1.5, the ratio of direct labor and foremen expense for maintenance of 30th Street Station equipment to total general maintenance direct labor and foreman expense was used to allocate the remainder of the expenses contained in the responsibility center. Since the maintenance of structure expense at 30th Street Station was minimal, only supplemental wage costs were added to this expense.

Station maintenance expenses are similar to cleaning and utilities expenses, in the respect that they are furnished to the station proper. Therefore, the preferred method to allocate these costs to the studied trains is on the basis of passenger utilization of the station. These calculations are contained in Exhibit A-1.5.

(f) Mail and Baggage

In order to isolate the baggage handling expense from the total expense contained in the mail and baggage responsibility center, the direct labor costs were developed from the Passenger Station Operations Reports (Form PD-1). The ratio of baggage handling direct labor expense to mail and baggage direct labor expense was 9.1% and was used to allocate total 1970 mail and baggage expense to baggage handling.

Based on observations of baggage handling activities, the preferred method for allocating this expense to the studied trains is on the basis of the number of pieces of baggage handled. From analysis of the Record of Baggage Checks Issued and Exchanged (Form PD-1011) for 1970, 9.6% of the total baggage handled at 30th Street Station was checked on the studied trains. It should be pointed out, however, that over half the baggage checked on the studied trains was checked to or from destinations beyond New York or Washington. The ratio of .096 was used to allocate baggage handling expense to the studied trains as detailed below:

1970 Mail and Baggage Expense - 30th Street Station	\$ 1,907,786
Adjustment for Gasoline Expense	<u>(27,650)</u>
Net Mail and Baggage Expense	<u>\$ 1,880,136</u>
Allocation to Baggage Handling: \$1,880,136 x .091 =	<u>\$171,092</u>
Allocation to Studied Trains: \$171,092 x .096 =	<u>\$16,425</u>

A further analysis of the baggage handling activity was made to determine the number of passengers that ride Metroliners and ship their baggage on another train having a baggage car. A review of the baggage check records for 1970 indicated that a total of 17 passengers rode the Metroliners to New York or Washington and shipped their baggage on another train. There were no data available from which the number of passengers who checked baggage on through trains, rode the Metroliners to New York or Washington, and changed trains to continue their trip to final destination could be determined. However, the general opinion of ticket sales and baggage handling supervision was that this situation occurs infrequently.

After completing the analysis of baggage expense at 30th Street Station we conferred with PC and DOT officials and decided to exclude baggage expense from our study. The immaterial size of this expense for 1970 and the predictions of the PC officials responsible for this function that station baggage expenses would continue to decrease in size were the major factors in our decision. The fact that baggage service was not considered as part of the intercity passenger service which we were studying also influenced our decision.

SUMMARY

The 30th Street Station expenses for 1970 that were allocated to the studied passenger services, based on the allocation techniques developed in this study, are summarized below:

	Studied Conventional <u>Service</u>	Metroliner <u>Service</u>
Ticket Sales and Service	\$ 309,305	\$ 253,222
Stationmaster	140,195	44,204
Station Cleaning	60,793	17,750
Station Utilities	53,846	15,721
Station Maintenance	<u>26,935</u>	<u>7,864</u>
	<u>\$ 591,074</u>	<u>338,761</u>

The above figures do not include overhead which is added in Chapter III of this report.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

30th Street Station Expense Allocations

		Studied Conventional <u>Trains</u>	<u>Metroliners</u>
<b>I. <u>Ticket Sales and Service</u></b>			
<b>A. <u>1970 Expense</u></b>			
1. System Expense	\$ 345,284		
2. Philadelphia Commuter Area Expense	631,671		
3. Less Erroneous Charges	(12,316)		
4. Less Metroliner Ticket Reservation System	<u>(45,334)</u>		45,334
Net expense	<u>\$ 919,305</u>		
<b>B. Allocation of Ticket Sales and Service Expense To Ticket Sales and Reservations &amp; Information</b>			
<b>1. 1970 Direct Labor Expense:</b>			
Ticket Clerks	\$158,246	29.7%	
R & I Clerks	<u>374,107</u>	<u>70.3</u>	
	<u>\$532,353</u>	<u>100.0%</u>	
<b>2. Allocation on the Basis of Direct Labor Expense Ratio:</b>			
Ticket Sales	\$919,305 x .297 = \$273,034		
Reservations & Information	\$919,305 x .703 = \$646,271		
<b>C. Allocation of Ticket Sales Expense To Studied Services</b>			
<b>Allocation on the Basis of Percent of Ticket Selling Workload Devoted to Studied Services:</b>			
Metroliners	\$273,034 x .288 =		78,634
Studied Conventional Trains	\$273,034 x .347 =		94,743
<b>D. Allocation of Reservations and Information Expense to Studied Services</b>			
<b>Allocation on the Basis of Percent of R&amp;I Workload Devoted to Studied Services:</b>			
Metroliners	\$646,271 x .200 =		129,254
Studied Conventional Trains	\$646,271 x .332 =		<u>214,562</u>
Allocated Ticket Sales and Service Expense		<u>\$ 309,305</u>	<u>253,222</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

30th Street Station Expense Allocations, Continued

		Studied Conventional <u>Trains</u>	<u>Metroliners</u>
<b>II. <u>Stationmaster</u></b>			
<b>A. <u>1970 Expense</u></b>			
1. Philadelphia Division Expense	\$ 262,015		
2. Less Expense Transferred to Other Accounts	(27,716)		
3. Less Redcap Revenues	(17,617)		
Net Expense	<u>\$ 216,682</u>		
<b>B. Allocation of Stationmaster <u>Expense to Studied Services</u></b>			
Allocation on the Basis of Frequency of Station Utilization by the Studied Trains:			
Metroliners	\$216,682 x .204 =		44,204
Studied Conventional Trains	\$216,682 x .647 =	<u>140,195</u>	<u>          </u>
Allocated Stationmaster Expense		<u>140,195</u>	<u>44,204</u>
<b>III. <u>Station Cleaning</u></b>			
<b>A. <u>1970 Expense</u></b>			
1. Cleaning Labor and Foremen Expense Charged to 30th Street Station Product Cost Centers			128,337
2. Allocation of Expenses Other Than Cleaning Labor and Foremen:			
Philadelphia Division Supv. of Bldgs. Expenses (Jan.-May)	\$ 366,672		
PCA Supv. of Sub Cleaners Expense (June-Dec.)	380,834		
Less Total Cleaning Labor and Foremen Expense Charged to Above Responsibility Centers	(432,578)		
Net Expense	<u>\$ 314,928</u>		
Ratio of 30th St. Station Cleaning Labor and Foremen Expense to Total Cleaning Labor and Foremen Expense:			
	<u>\$128,337</u>		
	\$432,578 = .297		
	\$314,928 x .297% =		<u>93,534</u>
Total Station Cleaning Expense			<u>\$ 221,871</u>
<b>B. <u>Allocation of Station Cleaning Expense to Studied Services</u></b>			
Allocation on the Basis of Percent Passenger Utilization of the Station:			
Metroliners	\$221,871 x .080 =		17,750
Studied Conventional Trains	\$221,871 x .274 =	<u>60,793</u>	<u>          </u>
Allocated Station Cleaning Expense		<u>\$ 60,793</u>	<u>17,750</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

30th Street Station Expense Allocations, Continued

		Studied Conventional <u>Trains</u>	<u>Metroliners</u>
<u>IV. Station Utilities</u>			
<u>A. 1970 Heating Expense</u>			
1. Philadelphia Div. Gen. Maint. Expense (Jan. - May)	\$ 141,441		
2. PCA Gen. Maint. Expense (June-Dec.)	<u>91,120</u>		
Net Expense	<u>\$ 232,561</u>		
Allocation to 30th Street Location Based on Accounts Payable Records: \$232,561 x .588 = \$136,746			
Allocation to 30th Street Station Based on Relative Area (Square Feet): \$136,746 x .689 = \$94,218			
Allocation to Studied Services Based on Percent Passenger Utilization of the Station:			
Metroliners	\$94,218 x .080 =		7,537
Studied Conventional Trains	\$94,218 x .274 =	25,816	
<u>B. 1970 Electricity Expense</u>			
1. Philadelphia Div. Gen. Maint. Expense (Jan. - May)	\$ 107,291		
2. PCA Gen. Maint. Expense (June - Dec.)	167,633		
3. Less Amount Billed to Concessions	<u>(34,218)</u>		
Net Expense	<u>\$ 240,706</u>		
Allocation to 30th Street Location Based on Relative Electricity Usage: \$240,706 x .528 = \$127,093			
Allocation to 30th Street Station Based on Relative Area (Square Feet): \$127,093 x .689 = \$87,567			
Allocation to Studied Services Based on Percent Passenger Utilization of the Station:			
Metroliners	\$87,567 x .080 =		7,005
Studied Conventional Trains	\$87,567 x .274 =	<u>23,993</u>	
Carried Forward		<u>\$ 49,809</u>	<u>14,542</u>



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

		Studied Conventional <u>Trains</u>	<u>Metroliners</u>
IV. <u>Station Utilities, Continued</u>			
Brought Forward		\$ 49,809	14,542
<u>C. 1970 Water and Sewage Expense</u>			
Philadelphia Div. Supv. of Structures Expense	\$21,383		
Allocation to 30th Street Station Based on Relative Area (Square Feet):			
\$21,383 x .689 =	14,733		
Allocation to Studied Services Based on Percent Passenger Utilization of the Station:			
Metroliners	\$14,733 x .080 =		1,179
Studied Conventional Trains	\$14,733 x .274 =	<u>4,037</u>	
Allocated Utilities Expense		\$ <u>53,846</u>	<u>15,721</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

30th Street Station Expense Allocations, Continued

		Studied Conventional <u>Trains</u>	<u>Metroliners</u>
<u>V. Station Maintenance</u>			
<u>A. 1970 Equipment Maintenance Expense</u>			
1. Direct Labor and Foremen Expense Charged to 30th Street Station Product Cost Centers and Work Orders	\$ 52,250		
2. Allocation of expenses Other Than Direct Labor and Foremen:			
Philadelphia Div. Gen. Maint. Expense (Jan. - May)	\$ 649,094		
PCA Gen. Maint. Expense (Jun. - Dec.)	756,988		
Less Total Direct Labor and Foremen Expense	(522,079)		
Less Heating Expense	(232,561)		
Less Electricity Expense	(274,924)		
Net Expense	<u>\$ 376,518</u>		
Ratio of 30th St. Station Direct Labor and Foremen Expense to Total Direct Labor and Foremen Expense			
	$\frac{\$ 52,250}{522,079} = .100$		
	\$376,518 x .100 =	<u>37,652</u>	
Total Equipment Maintenance Expense			
	\$ 89,902		
3. Allocation to Studied Services Based on Percent Passenger Utilization of the Station:			
Metroliners	\$89,902 x .080 =		7,192
Studied Conventional Trains	\$89,902 x .274 =	24,633	
<u>B. 1970 Structures Maintenance Expense</u>			
1. Direct Labor and Foremen Expense Charged to 30th Street Station Product Cost Centers	\$ 6,128		
2. Supplemental Wage Costs	<u>2,273</u>		
Net Expense	<u>\$ 8,401</u>		
3. Allocation to Studied Services Based on Percent Passenger Utilization of the Station:			
Metroliners	\$8,401 x .080 =		672
Studied Conventional Trains	\$8,401 x .274 =	<u>2,302</u>	
Allocated Maintenance Expense		<u>\$ 26,935</u>	<u>7,864</u>

WILMINGTON HEAVY REPAIR SHOP

The objective in analyzing the expenses of the Wilmington Heavy Repair Shop (WHRS) for 1970 was to identify the full cost of Metroliner repairs and maintenance performed there. A great deal of the Metroliner maintenance and almost all of the repairs to the Metroliner equipment is done at WHRS.

At the commencement of the study we observed the operations performed at WHRS, reviewed the manner in which cost data were captured, and analyzed the accounting and statistical records concerning WHRS operations. As a result of this initial study we concluded that, to equitably capture the full cost of Metroliner repair and maintenance at Wilmington, we would have to:

1. Identify the direct labor and material costs related to Metroliner repair and maintenance,
2. Allocate indirect shop expenses to the direct labor and material costs, and
3. Allocate WHRS overhead expenses to the total of the Metroliner direct labor and material and a proportionate share of the indirect shop expenses.

BACKGROUND

Before discussing the methods and techniques employed to accomplish the above it would be well to review the organization, type of work performed, and accounting procedures of WHRS.

(a) Organization

WHRS is composed of eight operating shops, each of which has been established as a separate responsibility center for accounting purposes. In addition there are two overhead responsibility centers - the Superintendent of Shops and the Accounting Department. All of the responsibility centers at WHRS

during 1970 are listed below:

<u>Description</u>	<u>Responsibility Center Number</u>
Superintendent of Shops	77000
Accounting Department	77001
Machine Shop	77200
Blacksmith Shop	77202
Passenger Car Shop	77400
Electric Shop - Rotating MU	77500
Electric Shop - Rotating GG1	77501
Non-Rotating Locomotive and Car	77503
Electric Locomotive Shop	77510
Boiler Shop	77511

The shops and departments are referred to by their responsibility numbers throughout this report as well as by their title.

(b) Work Performed

WHRS is PC's primary repair facility for Metroliner cars and GG1 electric locomotives. Commuter cars (MU) are also repaired there, but no locomotive propelled cars are repaired at WHRS. Personnel at WHRS also rebuild motors and repair parts that are received from other PC repair shops. During 1970 the material sent by other PC activities to WHRS for repair was processed through material stores and accounted for as manufactured items.

During 1970, in addition to repairing PC equipment, WHRS also performed the following operations:

1. Constructed road and equipment property.
2. Performed work for individuals, companies, or government agencies.
3. Manufactured and rehabilitated material.
4. Performed work requested by other PC units.

(d) WHRS Accounting Practices

Accounting for these operations consisted of billing individuals, companies, or governmental agencies for the work performed or transferring charges to other PC responsibility centers when work was performed for them. Material to be rehabilitated was transferred from inventory to the shop performing the rehabilitation, with the shop being charged the standard value of the material as an expense. Manufactured and rehabilitated material, when transferred to material stores, was charged to inventory at standard value. When the billing or transfer of charges was made, the shop performing the work was given a credit for direct labor and material used and for indirect expense incurred. This credit reduced the gross operating expenses of the shop performing the work.

Many of the overhead expenses are not allocated. Personnel in some of the WHRS operating shops provide building repair and maintenance and tool repair service for the other shops in the facility. The majority of the costs of operating the power plant, which provides steam and compressed air, are charged to one shop, as are the other utility expenses.

Material Stores in the WHRS facility also provide material for the Chesapeake Division and for the Wilmington Freight Car Repair Yard. This material is transferred out of stores and not charged to WHRS.

ALLOCATION OF INDIRECT  
SHOP EXPENSE

Prior to allocating indirect shop expense to the direct labor and material costs charged to the shop, it was necessary to deduct certain indirect expenses which were considered to be WHRS overhead rather than shop overhead. In the Machine Shop, Responsibility Center 77200, whose indirect cost allocation will be discussed to demonstrate the technique which was employed, it was

necessary to deduct the following before allocating the indirect shop expense:

1. Cleaning - Sanitary Service
2. Heating fuel
3. Water
4. Gas
5. Electricity
6. Power Plant Supplies

After deducting these costs from the "Other Controllable Cost" category on the Machine Shop Responsibility Report, \$15,569 remained to be allocated as indirect shop expense. Exhibit B-1.1 shows the allocation technique used for the Machine Shop and Exhibits B-1.2 through B-1.8 show the allocations for the other operating shops. The following sections describe the other computations necessary to fully allocate the Machine Shop indirect expense. The same techniques were used in allocating the indirect expense of the other operating shops.

(a) RWA Wages

The expense accrued for retroactive wage adjustments (RWA) was allocated for those classes of employees who received the retroactive wage payments on the basis of payroll costs. The 1970 RWA accrual applicable to the Machine Shop, \$24,248, was allocated to the direct labor straight and premium, and to the administrative and support personnel, which includes shop clerks and other indirect labor personnel. No retroactive wages were allocated to labor cost for supervisors because supervisors were not eligible for retroactive wage payments.

(b) Supplemental Wage Costs

The supplemental wage costs include fringe benefit cost, sick pay, pay for time off, and other indirect costs related to direct and indirect labor employed in the shop. These costs for Responsibility Center #77200, \$149,342,

were allocated on the basis of direct labor-straight cost, supervisory labor cost, and administrative and support labor cost. No allocation was made to direct labor premium because few, if any, of these costs are related to premium pay for overtime worked.

(c) Administrative and  
Support Personnel

Administrative and support personnel include shop clerks, vehicle operators, and other personnel in the shop who are not classified as direct labor or supervisory labor. The administrative and support personnel cost, \$36,454, was allocated on the basis of total direct labor and material.

(d) Supervision

The supervision costs of RC #77200, \$45,174, were allocated on the basis of the direct labor-straight costs because it was felt that supervision expense was closely correlated to the number of employees and the amount of straight time they worked.

(e) Other Controllable Costs

This category, which includes all other indirect expenses of the shop, amounted to \$15,569. These costs were distributed on the basis of direct labor and material.

(f) Shop Indirect Expense  
Allocation Factors

The total of direct labor-straight costs for RC #77200 and all of the costs allocated to it was then developed as was the total of direct material and all of the costs allocated to it. These totals are shown in Column 10 of Exhibit B-1.1.

The total direct labor cost and the costs allocated to it as shown in Column 10, \$612,304, was then divided by the total direct labor cost shown in Column 2, \$381,253, to arrive at a shop labor factor of 1.606031, which is shown in Column 11. This factor can be used to apply shop indirect expense to specific components of the direct labor cost of the shop. A single factor, rather than separate factors for direct labor-straight and direct labor-premium, was developed because direct labor-straight and direct-labor premium figures were not available for Metroliner repairs for all of 1970.

The same process was used to develop a shop material factor. The shop material factor for RC #77200, 1.083750, is shown in Column 11. This factor will be used to apply shop indirect expense to specific components of the direct material cost of the shop.

(g) Summary

The techniques described above were used to develop labor and material indirect expense factors for each of the eight operating shops for 1970. These calculations are shown in Exhibits B-1.1 - B-1.8. The factors developed for each shop are shown below:

<u>Shop</u>	<u>Labor Factor</u>	<u>Material Factor</u>
Machine	1.606031	1.083750
Blacksmith	1.602317	1.084949
Passenger car	1.731494	1.081303
Electric Shop - Rotating MU	1.559918	1.037991
Electric Shop - Rotating GGI	1.583338	1.068768
Non Rotating Locomotive and Car	1.582740	1.075530
Electric Locomotive	1.737192	1.056592
Boiler Shop	1.466342	1.017874



WILMINGTON HEAVY REPAIR  
SHOP OVERHEAD ALLOCATION

The WHRS overhead expense is composed of five components:

1. Direct labor and material costs applicable to the overhead expense, which are included in the direct labor and material costs of the various shops.

2. Indirect shop expense of each shop which is applicable to the direct labor and material cost of the shop. This is included in the shop factors described in the previous section.

3. Indirect shop expenses which were classified as WHRS overhead and not allocated as indirect shop expense in the previous section.

4. Organizational units which are classified as overhead. These are Superintendent of Shops, Responsibility Center #77000, and Accounting Department, Responsibility Center 77001.

5. Material Stores expense which is related to the direct material expense.

The direct labor and material cost and indirect shop expense applicable to WHRS overhead were developed by applying each shop's labor factor to the WHRS overhead direct labor in that shop and the material factor to the WHRS overhead direct material in the shop. To this was added the indirect shop expenses omitted from the computation of the shop factor. The development of the three expenses in this category, building maintenance and service costs, repair and cleaning of shop equipment, and power plant operation, are shown in Exhibits B-2.1 through B-2.3. These three expenses, plus the utilities expense, were then removed from the various responsibility centers and accumulated prior to allocation. This is shown in Exhibit B-3.

(a) Repair and Cleaning of Shop  
Equipment Allocation

The repair and cleaning of shop equipment costs were allocated on the basis of the number of mechanics in each shop. The number of mechanics in each shop and the percent of the repair and cleaning of shop equipment costs

allocated to that shop are shown below:

<u>Responsibility Center</u>	<u>Number of Mechanics</u>	<u>Percent of Allocation</u>
77200		
Power Plant	6	.89%
Machine Shop	34	5.04
Maintenance	16	2.37
77202	36	5.33
77400	92.5	13.70
77500	49	7.26
77501	63	9.33
77503	72.5	10.74
77510	246.5	36.52
77511	34	5.04
78431	<u>25.5</u>	<u>3.78</u>
	<u>675</u>	<u>100.00%</u>

Responsibility center #77200, Machine Shop, included the costs for building maintenance and power plant operation prior to accumulation of WHRS overhead. Only the Machine Shop portion of the repair and cleaning of shop equipment costs were allocated to responsibility center #77200. The allocation of the repair and cleaning of shop equipment costs is shown on Exhibit B-4.

(b) Fuel Oil Allocation

Fuel oil is used primarily for heating. It is used in both fuel hot air heaters and in generating steam. Neither the fuel oil nor the steam going to the various shops is measured. Consequently, since it is used primarily for heating, the fuel oil was allocated on the basis of the volume of operating area utilized by the various shops and offices. The volume utilized by each unit and the percent of fuel oil cost allocated to it are listed as follows:

<u>Responsibility Center</u>	<u>Volume Basis</u>	<u>Percent of Allocation</u>
77000	7,350	.88
77001	7,350	.88
77200	39,451	4.73
77202	44,440	5.33
77400	298,200	35.79
77500	22,130	2.66
77501	61,216	7.34
77503	20,446	2.45
77510	143,548	17.22
77511	81,324	9.76
Stores	97,212	11.66
Powerhouse	<u>10,800</u>	<u>1.30</u>
Total	<u>833,467</u>	<u>100.00</u>

The fuel oil expense allocated to each area is shown in Exhibit B-4.

(c) Medical Expense Allocation

Although the cost of providing medical service at WHRS is charged to a System Labor Relations responsibility center, it was possible to isolate this expense, which amounted to \$13,058 in 1970. It was felt that the most equitable basis of allocation was number of employees. Lesser weight was given to office employees in the allocation base to reflect their lower incidence of job injuries. The allocation base for each responsibility center and the percent of medical expense allocated to each center is listed below:

<u>Responsibility Center</u>	<u>Allocation Base</u>	<u>Percent of Allocation</u>
77000	1	.14%
77001	1	.14
77200		
Power Plant	6	.86
Machine Shop	35	5.03
Maintenance	16	2.3
77202	37	5.32
77400	92	13.22
77500	53	7.61
77501	64	9.20
77503	64	9.20
77510	257	36.93
77511	35	5.03
78430 Material Management	1	.14
78431 Material Management	<u>34</u>	<u>4.88</u>
	696	100.00%

The allocation of medical expense is shown in Exhibit B-4.

(d) Electric Power Expense  
Allocation

One meter is used to measure the electric power supplied to WHRS and to the Wilmington Freight Repair Yard. PC makes no attempt to charge each responsibility center for the power consumed. To allocate this expense, the number of employees in each responsibility center was used as the basis, giving lesser weight to office employees to reflect their lower use of electricity and of the compressed air supplied by the power plant. The allocation base and the percent of electric power expense allocated to each responsibility center is shown below:

<u>Responsibility Center</u>	<u>Allocation Base</u>	<u>Percent of Allocation</u>
77000	1	.14
77001	1	.14
77200		
Power Plant		
Machine Shop	35	4.85
Maintenance	16	2.23
77202	37	5.12
77400	92	12.74
77500	53	7.34
77501	64	8.86
77503	64	8.86
77510	257	35.59
77511	35	4.85
78430 - Material Management	1	.14
78431 - Material Management	34	4.71
44320 - Freight Repair Yard	<u>32</u>	<u>4.43</u>
	<u>722</u>	<u>100.00</u>

The allocation of electric power expense is shown in Exhibit B-4.

(e) Building Maintenance  
Expense Allocation

The maintenance force at WHRS provides maintenance service for WHRS, Wilmington Freight Car Repair Yard, and various other Eastern Region facilities.

PC officials estimate that two-thirds of the maintenance force's work is done for WHRS. Consequently, two-thirds of the maintenance force's expense was allocated among WHRS responsibility centers on the basis of building area utilized. The area utilized by each responsibility center and the percent of the maintenance expense allocated to each responsibility center is shown below. The allocation of the maintenance expense is shown on Exhibit B-4.

<u>Responsibility Center</u>	<u>Area</u>	<u>Percent of Allocation</u>
77000 and 77001	14700	3.72
77200	16039	4.05
77202	20720	5.24
77400	149100	37.70
77500	12130	3.07
77501	21572	5.45
77503	10446	2.64
77510	49688	12.56
77511	27108	6.85
Material Management	63242	15.99
Power Plant	<u>10800</u>	<u>2.73</u>
	395545	100.00

(f) Power Plant  
Maintenance

Power plant maintenance costs were allocated on the same basis as electric power expense, weighted number of employees. No allocation was made to building maintenance. The allocation is shown in Exhibit B-4.

(g) Shop Superintendent and  
Accounting Department  
Allocation

The expenses for responsibility centers 77000 and 77001, Shop Superintendent and Accounting Department, were totaled and allocated together. This expense was allocated among the operating shops on the basis of their total expenses. Exhibit B-4 shows this allocation and the WHRS overhead expense allocated to each of the operating shops.

(h) WHRS Overhead Factors

After the WHRS overhead expenses were allocated to the operating shops, WHRS overhead factors were developed for each shop. This was done by dividing the WHRS overhead expense allocated to each shop by the direct labor and material, less that portion treated as an overhead expense, charged to that shop. The computation of this factor for each shop is shown in Exhibit B-5. The WHRS overhead factor developed for each shop was then used to charge WHRS overhead to the direct material and labor charged to that shop.

(i) Material Stores Allocation

The material stores warehouse at WHRS provides material for the WHRS facility, the freight repair yards, and other PC maintenance of equipment facilities. The material issued to the WHRS facility is classified as "consumed" if it is to be used in repairing equipment, and "manufacture" if it is to be used to manufacture or rehabilitate material. Material issued to other locations is issued as a "transfer". The material issued in 1970 from the Wilmington warehouse is shown below:

Consumed	\$ 6,210,449
Manufacture	2,947,666
Transfer	<u>4,485,913</u>
Total	<u>\$ 13,644,028</u>

The total material stores cost from Column 11 of the WHRS Overhead Cost Allocation Schedule (Exhibit B-4) is \$524,431. Dividing the cost of \$524,431 by the value of material issued, \$13,644,028, results in a material stores factor of .038436 to be applied to direct material.

METROLINER REPAIR  
COSTS

The indirect expense factors, WHRS overhead factors and material stores factor were totaled to arrive at a combined factor to use in arriving at the full cost of specific WHRS operations. Exhibit B-6 shows the development of these combined factors.

(a) Metroliner Allocated  
Cost

Applying the combined allocation factors to the direct material and labor expenses charged to Metroliner repairs by each operating shop results in a total allocated cost of Metroliner repairs for 1970 of \$2,647,849. This is shown in Exhibit B-7. There are several adjustments which must be made to this total to reflect the actual Metroliner repair cost at WHRS.

(b) Material Not  
In Inventory

In the stores warehouse at WHRS is a supply of Metroliner material which was delivered as part of the original contract for the Metroliner cars. This material has not been paid for, is not included in the WHRS inventory and, when issued, is not charged to the shop using it. In 1970, \$135,840 of this material was used in repairing Metroliners and must be added to the allocated cost of repairing Metroliners.

(c) Manufacturing Variance

Material which was rehabilitated and manufactured at WHRS was taken into inventory at a standard price, rather than at the cost to manufacture or rehabilitate the material. This resulted in a variance between the inventory value (material cost charged when issued), and the actual manufactured or

rehabilitated cost of the material used in Maintenance of Equipment operations. Exhibit B-8 shows the development of cost of rehabilitated and manufactured material by application of the combined factors developed in Exhibit B-7. For 1970 this cost of rehabilitated and manufactured material was \$5,688,694. Material received into inventory from manufacturing amounted to \$6,452,993 in 1970. Subtracting the manufacturing cost from the inventory receipts results in a variance of \$764,333.

This variance was spread between that material manufactured for and used in Metroliner repair operations and that material manufactured and used in other repair operations. This is shown below.

		<u>% of</u> <u>Variance</u>	<u>Amount of</u> <u>Variance</u>
Manufactured Material:			
Metroliner	\$ 194,332	3.01	\$ 23,006
Other	<u>6,258,661</u>	<u>96.99</u>	<u>741,327</u>
	<u>\$ 6,452,993</u>	<u>100.00</u>	<u>\$ 764,333</u>

The \$23,006 portion of the variance applicable to Metroliner repairs is a credit, and the Metroliner repair costs must be reduced by this amount.

(d) Warranty Material

Metroliner maintenance items which were under warranty were either returned to the manufacturer for repair or replacement, or repaired at WHRS and the manufacturer billed for the cost of the repairs.

During 1970 manufacturers were sent bills totaling \$26,849 for warranty work performed by WHRS on Metroliners. The charges which resulted in these bills are included in the Metroliner allocated cost, and \$26,849 must be deducted from that cost. Although some of these bills have not been paid and are being contested by the manufacturer, the total amount was deducted from the allocated cost of Metroliner repairs.



During 1970, \$245,428 in material was returned to manufacturers for repair or replacement. Accounting procedures in effect in 1970 resulted in a charge to Metroliner material cost when the material was replaced on a car. When the repaired or replaced material was received from the manufacturer a credit was given to the repair shop, but a corresponding credit was not made to Metroliner material expense. As a result, the Metroliner material expense was overstated by \$245,428, and the Metroliner allocated repair cost should be reduced by this amount. A list of the material returned to manufacturers under warranty is included in Exhibit B-9.

(e) Material Reclaims

When material was issued for Metroliner repairs it was charged to Metroliner material expense. Any unused material was returned to the material stores warehouse and a credit was issued to the appropriate responsibility center. However this credit was not applied to Metroliner material expense. Total Metroliner material reclaims for 1970 were \$91,365 and the allocated Metroliner repair cost must be reduced by this amount.

(f) Metroliner Cost Summary

After the allocated Metroliner repair expense was adjusted by the items previously described, the Metroliner repair costs at WHRS for 1970 were \$2,397,041. These adjustments are summarized on the following page:

Allocated Metroliner Repair Cost at WHRS			\$ 2,647,849
Plus:			
Material Not in Inventory			<u>135,840</u>
			2,783,606
Less:			
Manufacturing Variance	\$ 23,006		
Warranty Work Billed to Manufacturer	26,849		
Material Returned to Manufacturer	245,428		
Material Reclaims	<u>91,365</u>	<u>386,648</u>	
Metroliner Repair Costs at WHRS - 1970			<u>\$ 2,397,041</u>

(g) Metroliner Modification

During late 1969 and early 1970 all Metroliner cars were modified by installing newly designed couplers at a total cost of \$179,184. This cost was charged to the maintenance of Metroliners, and the \$113,086 portion of the total which occurred in 1970 is included in the above Metroliner costs. This \$113,086 represents a non-recurring expense.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Machine Shop, Responsibility Center 77200  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total	RWA	Total	Supple-	Total	Support	Super-	Other	Total	Shop
		Costs	Wages	Columns	mental	Columns	Personnel	vision	Con-	Columns	Factors
				2 and 3	Wage	4 and 5			trollable	6-9	Col.10 ÷ Col.2
					Costs				Costs		
Direct Labor - Straight	\$	376,232	\$ 22,402	\$ 398,634	\$ 129,345	\$ 527,979	\$ 23,394	\$ 45,174	\$ 9,992	\$ 606,539	
Direct Labor - Premium		<u>5,021</u>	<u>299</u>	<u>5,320</u>		5,320	312		133	<u>5,765</u>	
Total Direct Labor		<u>381,253</u>	<u>22,701</u>	<u>403,954</u>						<u>612,304</u>	<u>1.606031</u>
Direct Material		217,217		217,217		217,217	12,748		5,444	235,409	<u>1.083750</u>
Supervision		34,108		34,108	11,066	45,174		(45,174)			
Administrative and Support Personnel		25,976	1,547	27,523	8,931	36,454	(36,454)				
Supplemental Wage Costs	\$	173,590									
Less RWA Wages		<u>24,248</u>	(24,248)								
Net Supplemental Wage Costs		149,342		149,342	(149,342)	-					
Other Controllable Costs		192,036									
Less WHRS Overhead Costs:											
Cleaning - Sanitary Service		34									
Heating Fuel		117,138									
Water		9,239									
Gas		563									
Electricity		47,567									
Power Plant Supplies		<u>1,844</u>									
To be Allocated		<u>15,569</u>		<u>15,569</u>		<u>15,569</u>			(15,569)		
Total		<u>847,713</u>		<u>\$ 847,713</u>		<u>\$ 847,713</u>				<u>\$ 847,713</u>	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Blacksmith Shop, Responsibility Center 77202  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total Costs	RWA Wages	Total Columns 2 and 3	Supple- mental Wage Costs	Total Columns 4 and 5	Support Personnel	Super- vision	Other Con- trollable Costs	Total Columns 6-9	Shop Factors Col.10 ÷ Col.2
Direct Labor - Straight	\$	251,110	\$12,440	\$ 263,550	\$ 89,387	\$ 352,937	\$ 6,427	\$ 28,533	\$ 15,962	\$ 403,859	
Direct Labor - Premium		<u>3,238</u>	<u>160</u>	<u>3,398</u>		3,398	83		206	<u>3,687</u>	
Total Direct Labor		<u>254,348</u>		<u>266,948</u>						<u>407,546</u>	1.602317
Direct Material		927,765		927,765		927,765	22,623		56,190	1,006,578	<u>1.084949</u>
Supervision		21,306		21,306	7,227	28,533		(28,533)		-	
Administrative and Support Personnel	\$ 20,728	20,728	1,027	21,755	7,378	29,133	(29,133)				
Supplemental Wage Costs	117,619										
Less RWA Wages	<u>13,627</u>	13,627	(13,627)								
Net Supplemental Wage Costs		103,992		103,992	(103,992)						
Other Controllable Costs:											
Less WHRS Overhead Costs	74,649										
Heating Fuel	<u>2,291</u>										
To be Allocated		<u>72,358</u>		<u>72,358</u>		<u>72,358</u>			(72,358)		
Total	\$	<u>1,414,124</u>		<u>1,414,124</u>		<u>1,414,124</u>				<u>1,414,124</u>	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Passenger Car Shop, Responsibility Center 77400  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total Costs	RWA Wages	Total Columns 2 and 3	Supple- mental Wage Costs	Total Columns 4 and 5	Support Personnel	Super- vision	Other Con- trollable Costs	Total Columns 6-9	Shop Factor Col.10 ÷ Col.2
Direct Labor - Straight	\$	563,333	\$ 22,379	\$ 585,712	\$ 237,081	\$ 822,793	\$ 35,930	\$ 121,205	\$ 11,691	\$ 991,619	
Direct Labor - Premium		<u>26,698</u>	1,060	<u>27,758</u>		27,758	1,704		554	<u>30,016</u>	
Total Direct Labor		<u>590,031</u>		<u>613,470</u>						<u>1,021,635</u>	1.731494
Direct Material		1,003,114		1,003,114		1,003,114	61,534		20,022	1,084,670	<u>1.081303</u>
31X Supervision		86,281		86,281	34,924	121,205		(121,205)		-	
Administration and Support Personnel		67,896	2,698	70,594	28,574	99,168	(99,168)			-	
Supplemental Wage Costs	\$326,716										
Less RWA Wages	<u>26,137</u>	26,137	(26,137)	-		-				-	
Net Supplemental Wage Costs		300,579		300,579	(300,579)	-				-	
Other Controllable Costs	32,473										
Less: WHRS Overhead Costs: Cleaning and Sanitary Supplies	<u>206</u>										
To be Allocated		<u>32,247</u>		<u>32,267</u>		<u>32,267</u>			(32,267)	<u>-</u>	
Total	\$	<u>2,106,305</u>		<u>2,106,305</u>		<u>2,106,305</u>				<u>\$ 2,106,305</u>	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Electric Shop - Rotating MU, Responsibility Center 77500  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total	RWA	Total	Supple-	Total	Support	Super-	Other Con-	Total	Shop
		Costs	Wages	Columns	mental	Columns	Personnel	vision	trollable	Columns	Factors
				2 and 3	Wage	4 and 5			Costs	6-9	Col.10 ÷ Col.2
					Costs						
Direct Labor - Straight	\$	352,288	\$ 23,092	\$ 375,380	\$ 121,436	\$ 496,816	\$ 9,691	\$ 42,727	\$ 4,570	\$ 553,804	
Direct Labor - Premium		<u>9,393</u>	616	<u>10,009</u>		10,009	258		122	<u>10,389</u>	
Total Direct Labor		<u>361,681</u>		<u>385,389</u>						<u>564,193</u>	1.559918
Direct Material		524,232		524,232		524,232	13,534		6,382	544,148	<u>1.037991</u>
Supervision		32,283		32,283	10,444	42,727		(42,727)		-	
Administrative and Support Personnel		16,652	1,091	17,743	5,740	23,483	(23,483)			-	
Supplemental Wage Costs	\$ 162,419										
Less: RWA Wages	<u>24,799</u>	24,799	(24,799)	-		-				-	
Net Supplemental Wage Costs		137,620		137,620	(137,620)	-				-	
Other Controllable Costs		<u>11,074</u>		<u>11,074</u>		<u>11,074</u>			(11,074)	<u>-</u>	
Total	\$	<u>1,108,341</u>		<u>1,108,341</u>		<u>1,108,341</u>				<u>1,108,341</u>	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Electric Shop Rotating Responsibility Center 77501  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total Costs	RWA Wages	Total Columns 2 and 3	Supple- mental Wage Costs	Total Columns 4 and 5	Support Personnel	Super- vision	Other Con- trollable Costs	Total Columns 6-9	Shop Factors Col.10 ÷ Col.2
Direct Labor - Straight	\$	420,417	\$ 21,084	\$ 441,501	\$ 151,566	\$ 593,067	\$ 8,552	\$ 45,362	\$ 21,809	\$ 668,790	
Direct Labor - Premium		<u>6,785</u>	340	<u>7,125</u>		7,125	138		352	<u>7,615</u>	
Total Direct Labor		<u>427,202</u>		<u>448,626</u>						<u>676,405</u>	1.583338
Direct Material		1,413,181		1,413,181		1,413,181	27,374		69,807	1,510,362	<u>1.068768</u>
Supervision		33,770		33,770	11,592	45,362		(45,362)			
Administrative and Support Personnel		25,565	1,282	26,847	9,217	36,064	(36,064)				
Supplemental Wage Costs	\$	195,081									
Less RWA Wages		<u>22,706</u>	(22,706)								
Net Supplemental Wage Cost		172,375		172,375	(172,375)						
Other Controllable Costs		92,043									
Less WHRS Overhead Cost: Cleaning and Sanitary Service		<u>75</u>									
To be Allocated		<u>91,968</u>		<u>91,968</u>		<u>91,968</u>		(91,968)			
Total	\$	<u>2,186,767</u>		<u>2,186,767</u>		<u>2,186,767</u>				<u>2,186,767</u>	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Non-Rotating Locomotive and Car Shop, Responsibility Center 77503  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total Costs	RWA Wages	Total Columns 2 and 3	Supple- mental Wage Costs	Total Columns 4 and 5	Support Personnel	Super- vision	Other Con- trollable Costs	Total Columns 6-9	Shop Factors Col.10 ÷ Col.2
Direct Labor - Straight	\$	516,681	\$ 18,557	\$ 535,238	\$ 172,227	\$ 707,465	\$ 17,331	\$ 84,704	\$ 23,095	\$ 832,595	
Direct Labor - Premium		<u>31,638</u>	1,136	<u>32,774</u>		32,774	1,061		1,415	<u>35,250</u>	
Total Direct Labor		<u>548,319</u>		<u>568,012</u>						<u>867,845</u>	1.582740
Direct Material		651,185		651,185		651,185	21,086		28,098	700,369	<u>1.075530</u>
Supervision		64,084		64,084	20,620	84,704		(84,704)			
Administrative and Support Personnel		28,831	1,036	29,867	9,611	39,478	(39,478)				
Supplemental Wage Costs	\$	223,187									
Less RWA Wages		<u>20,729</u>	(20,729)								
Net Supplemental Wage Costs		202,458		202,458	(202,458)						
Other Controllable Costs		<u>52,608</u>		<u>52,608</u>		<u>52,608</u>			(52,608)		
Total	\$	<u>1,568,214</u>		<u>1,568,214</u>		<u>1,568,214</u>				<u>1,568,214</u>	



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Electric Locomotive Shop, Responsibility Center 77510  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total Costs	RWA Wages	Total Columns 2 and 3	Supple- mental Wage Costs	Total Columns 4 and 5	Support Personnel	Super- vision	Other Con- trollable Costs	Total Columns 6-9	Col.10 + Col.2
Direct Labor - Straight	\$ 1,552,196	\$ 78,276	\$ 1,630,472	\$ 670,998	\$ 2,301,470	37,541	\$ 326,780	\$ 54,730	\$ 2,720,521		
Direct Labor - Premium	<u>38,352</u>	1,934	<u>40,286</u>		40,286	928		1,353	<u>42,567</u>		
Total Direct Labor		<u>1,590,548</u>		<u>1,670,758</u>					<u>2,763,088</u>		<u>1.737192</u>
Direct Material	4,445,881		4,445,881		4,445,881	102,364		149,237	4,697,482		<u>1.056592</u>
Supervision	231,507		231,507	95,273	326,780		(326,780)				
Administrative and Support Personnel	94,983	4,790	99,773	41,060	140,833	(140,833)					
Supplemental Wage Costs	\$ 892,331										
Less RWA Wages	<u>85,000</u>	85,000	(85,000)								
Net Supplemental Costs		807,331		807,331	(807,331)						
Other Controllable Costs	198,262										
Less WHRS Overhead Costs:											
Heating Fuel	656										
Electricity	(7,998)										
Cleaning and Sanitary Supplies	<u>284</u>										
To be Allocated		<u>205,320</u>		<u>205,320</u>		<u>205,320</u>		(205,320)			
Total	\$ 7,460,570		\$ 7,460,570		7,460,570				\$ 7,460,570		

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Boiler Shop, Responsibility Center 77511  
1970 Indirect Shop Expense Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Total Costs	RWA Wages	Total Columns 2 and 3	Supple- mental Wage Costs	Total Columns 4 and 5	Support Personnel	Super- vision	Total Con- trollable Costs	Total Columns 6-9	Shop Factors Col.10 ÷ Col.2
Direct Labor - Straight		\$ 267,083	\$ 14,317	\$ 281,400	\$ 94,241	\$ 375,641	\$ 563	\$ 14,619	\$ 4,465	\$ 395,288	
Direct Labor - Premium		9,274	497	9,771		9,771	20		155	9,946	
Total Direct Labor		<u>276,357</u>		<u>291,171</u>						<u>405,234</u>	1.466342
Direct Material		120,175		120,175		120,175	241		1,907	122,323	1.017874
Supervision		(10,920)		10,951	3,668	14,619	241	(14,619)			
Administrative and Support Labor		586	31	617	207	824	(824)				
Supplemental Wage Costs	\$ 112,961										
Less: RWA Wages	<u>14,845</u>	14,845	(14,845)								
Net Supplemental Wage Costs		98,116		98,116	(98,116)						
Other Controllable Costs		<u>6,527</u>		<u>6,527</u>		<u>6,527</u>			(6,527)		
Total		<u>\$ 527,557</u>		<u>\$ 527,557</u>		<u>\$ 527,557</u>				<u>\$ 527,557</u>	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Building Maintenance and Service Costs  
1970

<u>Respon-</u> <u>sibility</u> <u>Center</u>		<u>Indirect</u> <u>Overhead</u>	<u>Direct</u> <u>Costs*</u>	<u>Shop</u> <u>Factor</u>	<u>Total</u> <u>Cost</u>	<u>Respon-</u> <u>sibility</u> <u>Center</u> <u>Total</u>
77000	Material Cleaning and Sanitary Service	\$ 2,799	\$ 738	-	\$ 738 <u>2,799</u>	\$ 3,537
77200	Labor Material Cleaning and Sanitary Service		58,200 12,969	1.60603 1.08375	93,471 14,055 <u>34</u>	107,560
77202	Labor Material		3,023 418	1.60232 1.08495	4,844 <u>454</u>	5,298
77400	Labor Material Cleaning and Sanitary Supplies		23,950 703	1.73149 1.08130	41,469 760 <u>206</u>	42,435
77501	Labor Cleaning and Sanitary Service		1,429	1.58334	2,263 <u>75</u>	2,338
77503	Labor Material		4,317 32	1.58274 1.07553	6,833 <u>34</u>	6,867
77510	Labor Material Cleaning and Sanitary Supplies		855 3,021	1.73719 1.05659	1,485 3,192 <u>284</u>	4,961
77511	Labor Material		6,211 616	1.46634 1.01787	9,107 <u>627</u>	<u>9,734</u>
	Total Cost					\$ 182,730 <u><u>          </u></u>

\*Labor includes straight and premium

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Repair and Cleaning of Shop Equipment  
1970

<u>Responsi-</u> <u>bility</u> <u>Center</u>		<u>Direct</u> <u>Costs*</u>	<u>Shop</u> <u>Factor</u>	<u>Total</u> <u>Cost</u>	<u>Responsi-</u> <u>bility</u> <u>Center</u> <u>Total</u>
77200	Labor	\$ 44,350	1.60603	\$ 71,227	
	Material	8,344	1.08375	<u>9,043</u>	\$ 80,270
77202	Labor	5,784	1.60231	9,268	
	Material	2,749	1.08495	<u>2,983</u>	12,251
77400	Labor	7,403	1.73149	12,818	
	Material	2,496	1.08130	<u>2,699</u>	15,517
77500	Labor	7,363	1.55992	11,486	
	Material	146	1.03799	<u>152</u>	11,638
77501	Material	318	1.06877	<u>340</u>	340
77503	Labor	19,602	1.58274	31,025	
	Material	3,665	1.07553	<u>3,942</u>	34,967
77510	Labor	36,753	1.73719	63,847	
	Material	11,845	1.05659	<u>12,515</u>	76,362
77511	Labor	4,712	1.46634	6,909	
	Material	1,562	1.01787	<u>1,590</u>	<u>8,499</u>
Total Cost					\$ <u>239,844</u>

\*Labor includes straight and premium

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Power Plant Operation Cost  
1970

<u>Responsi-</u> <u>bility</u> <u>Center</u>		<u>Indirect</u> <u>Overhead</u>	<u>Direct</u> <u>Costs*</u>	<u>Shop</u> <u>Factor</u>	<u>Total</u> <u>Cost</u>	<u>Responsi-</u> <u>bility</u> <u>Center</u> <u>Total</u>
77000	Material	\$	\$ 90	-	\$ 90	
	Power Plant Supplies		71		<u>71</u>	\$ 161
77200	Labor		46,346	1.60603	74,433	
	Material		17,953	1.08375	19,457	
	Power Plant Supplies	1,844			<u>1,844</u>	95,734
77202	Labor		1,268	1.60231	<u>2,032</u>	2,032
77400	Labor		278	1.73149	<u>481</u>	481
77503	Labor		136	1.58274	215	
	Material		12	1.07553	<u>13</u>	228
77510	Labor		70	1.73719	122	
	Material		12	1.05659	<u>13</u>	135
77511	Labor		2,161	1.46634	3,169	
	Material		488	1.01787	<u>497</u>	<u>3,666</u>
	Total Cost					\$ <u>102,437</u>

\*Labor includes straight and premium

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Overhead Cost Accumulation - 1970

<u>Responsi- bility Center</u>	(1)  Total <u>Expenses</u>	(2) Power Plant Operation Accumu- lation	(3) Building Main- tenance Accumu- lation	(4) Repair of Shop Equipment Accumu- lation	(5) Utility Accumu- lation	(6) Operating Costs: <u>Columns 1-5</u>
77200	\$ 1,024,098	\$ (95,734)	\$ (107,560)	\$ (80,270)	\$ (174,507)	\$ 566,027
77202	1,416,415	(2,032)	(5,298)	(12,251)	(2,291)	1,394,543
77400	2,106,511	(481)	(42,435)	(15,517)		2,048,078
77500	1,108,341			(11,638)		1,096,703
77501	2,186,842		(2,338)	(340)		2,184,164
77503	1,568,214	(228)	(6,867)	(34,967)		1,526,152
77510	7,453,512	(135)	(4,961)	(76,362)	7,342	7,379,396
77511	527,557	(3,666)	(9,734)	(8,499)		505,658
 WHRS Overhead Costs:						
77000	423,740	(161)	(3,537)			420,042
77001	76,771					76,771
Material Stores	472,439					472,439
Power Plant		102,437				102,437
Building Maintenance and Service			182,730			182,730
Repair and Cleaning Shop Equipment				239,844		239,844
Heating Fuel					120,085	120,085
Water					9,239	9,239
Gas					563	563
Electricity					39,569	39,569
System Medical Costs	13,058					13,058
Total	<u>\$ 18,377,498</u>					<u>\$ 18,377,498</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
WHRS Overhead Cost Allocations - 1970

Responsi- bility Center	(1) Operating Costs	(2) Repair and Cleaning Shop Equipment	(3) Fuel Oil Cost	(4) Medical Costs	(5) Total Columns 1 - 4	(6) Utilities and Power Plant	(7) Main- tenance Costs	(8) Power Plant Main- tenance	(9) Total Columns 5 - 8	(10) 77000 77001	(11) Total Columns 9 and 10	(12) Overhead Allocated Total Columns 2,3,4, 6,7,8,10
77200	\$ 566,027	\$ 12,088	\$ 5,704	\$ 657	\$ 584,476	\$ 7,547	\$ 5,189	\$ 174	\$ 597,386	\$ 17,432	\$ 614,818	\$ 48,791
77202	1,394,543	12,784	5,992	695	1,414,014	7,967	6,713	183	1,428,877	41,695	1,470,572	76,029
77400	2,048,078	32,859	43,123	1,726	2,125,786	19,825	48,300	456	2,194,367	64,032	2,258,399	210,321
77500	1,096,703	17,413	3,194	994	1,118,304	11,421	3,933	263	1,133,921	33,100	1,167,021	70,318
77501	2,184,164	22,377	8,850	1,201	2,216,592	13,787	6,982	317	2,237,678	65,298	2,302,976	118,812
77503	1,526,152	25,759	2,954	1,201	1,556,066	13,787	3,382	317	1,573,552	45,917	1,619,469	93,317
77510	7,379,396	87,591	20,763	4,823	7,492,573	55,383	16,092	1,272	7,565,320	220,761	7,786,081	406,685
77511	505,658	12,088	11,756	657	530,159	7,547	8,776	174	546,656	15,952	562,608	56,950
WHRS Overhead Costs:												
77000	420,042		1,063	18	421,123	218	2,383	5	423,729	(423,729)		
77001	76,771		1,063	18	77,852	218	2,383	5	80,458	(80,458)		
Material Stores	472,439	9,066	14,062	656	496,223	7,548	20,486	174	524,431		524,431	
Power Plant	102,437	2,135	1,561	112	106,245	(106,245)	3,498	(3,498)				
Building Maintenance and Service Repair and Cleaning Shop Equipment	182,730 239,844	5,684 239,844		300	188,714	3,470	(192,175)					
Heating Fuel	120,085		(120,085)									
Water	9,239				9,239	(9,239)						
Gas	563				563	(563)						
Electricity	39,569				39,569	(39,569)						
System Medical Costs	13,058			(13,058)								
System Security Costs												
Allocation for Division and Region Not Included in WHRS						6,898	64,067	158	71,123		71,123	
Total	\$ 18,377,498				\$ 18,377,498				\$ 18,377,498		\$ 18,377,498	

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

1970 WHRS Overhead Factors

Respon- sibility Center	Expense	(1)	(2)	(3)	(4)	(5)
		Direct Expenses Charged	WHRS Overhead Expenses	Operating Direct Expenses Col.1-Col.2	WHRS Overhead	WHRS Overhead Factor Col.4 ÷ Col.3
77200	Direct Labor	\$ 381,253	\$ 148,896	\$ 232,357		
	Direct Material	217,217	39,266	177,951		
	Total			410,308	\$ 48,791	.118913
77202	Direct Labor	254,348	10,075	244,273		
	Direct Material	927,765	3,167	924,598		
	Total			1,168,871	76,029	.065045
77400	Direct Labor	590,031	31,631	558,400		
	Direct Material	1,003,114	3,199	999,915		
	Total			1,558,315	210,321	.134967
77500	Direct Labor	361,681	7,363	354,318		
	Direct Material	524,232	146	524,086		
	Total			878,404	70,318	.080052
77501	Direct Labor	427,202	1,429	425,773		
	Direct Material	1,413,181	318	1,412,863		
	Total			1,838,636	118,812	.064620
77503	Direct Labor	548,319	24,055	524,264		
	Direct Material	651,185	3,709	647,476		
	Total			1,171,740	93,317	.079640
77510	Direct Labor	1,590,548	37,678	1,552,870		
	Direct Material	4,445,881	14,878	4,431,003		
	Total			5,983,873	406,685	.067964
77511	Direct Labor	276,357	13,084	263,273		
	Direct Material	120,175	2,666	117,509		
	Total			380,782	56,950	.149561



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Combined Allocation Factors

		<u>Direct</u> <u>labor</u>	<u>Direct</u> <u>Material</u>
77200	Shop Factors	1.606031	1.083750
	WHRS Overhead	.118913	.118913
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.724944</u>	<u>1.241099</u>
77202	Shop Factors	1.602317	1.084949
	WHRS Overhead	.065045	.065045
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.667362</u>	<u>1.188430</u>
77400	Shop Factors	1.731494	1.081303
	WHRS Overhead	.134967	.134967
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.866461</u>	<u>1.254706</u>
77500	Shop Factors	1.559918	1.037991
	WHRS Overhead	.080052	.080052
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.639970</u>	<u>1.156479</u>
77501	Shop Factors	1.583338	1.068768
	WHRS Overhead	.064620	.064620
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.647958</u>	<u>1.171824</u>
77503	Shop Factors	1.582740	1.075530
	WHRS Overhead	.079640	.079640
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.662380</u>	<u>1.193606</u>
77510	Shop Factors	1.737192	1.056592
	WHRS Overhead	.067964	.067964
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.805156</u>	<u>1.162992</u>
77511	Shop Factors	1.466342	1.017874
	WHRS Overhead	.149561	.149561
	Material Stores	<u>          </u>	<u>.038436</u>
	Combined Factors	<u>1.615903</u>	<u>1.205871</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
1970 Metroliner Repair Costs

		<u>Direct</u>	<u>Combined</u>	<u>Total</u>
		<u>Expense</u>	<u>Allocation</u>	<u>Cost</u>
			<u>Factors</u>	<u>1 X 2</u>
77200	Labor	\$ 1,671	1.724944	\$ 2,882
	Material	3	1.241099	4
77202	Labor	14,031	1.667362	23,395
	Material	27,613	1.188430	32,816
77400	Labor	385,731	1.866461	719,952
	Material	891,816	1.254706	1,118,967
77500	Labor	412	1.639970	676
	Material	1,599	1.156479	1,849
77501	Labor	238	1.647958	392
	Material	77	1.171824	90
77503	Labor	251,283	1.662380	417,728
	Material	248,654	1.193606	296,795
77510	Labor	2,005	1.805156	3,619
	Material	1,077	1.162992	1,253
77511	Labor	6,849	1.615903	11,067
	Material	13,570	1.205871	<u>16,364</u>
Total Allocated Costs				\$ <u>2,647,849</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
1970 Manufactured Material Costs

		<u>Direct</u> <u>Expense</u>	<u>Combined</u> <u>Factors</u>	<u>Total</u> <u>Cost</u> <u>1 X 2</u>
77200	Labor	\$ 23,650	1.724944	\$ 40,796
	Material	1,836	1.241099	2,279
77202	Labor	136,119	1.667362	226,960
	Material	900,600	1.188430	1,070,300
77400	Labor	12,125	1.866461	22,631
	Material	4,649	1.254706	5,833
77500	Labor	342,848	1.639970	562,260
	Material	558,718	1.156479	646,146
77501	Labor	424,774	1.647958	700,010
	Material	1,294,736	1.171824	1,517,203
77503	Labor	238,684	1.662380	396,783
	Material	339,577	1.193606	405,321
77510	Labor	64	1.805156	116
	Material	2,275	1.162992	2,646
77511	Labor	11,267	1.615903	18,206
	Material	59,048	1.205871	<u>71,204</u>
	Total Manufacturing Cost			5,688,694
	Material Receipts from Manufacturing			<u>6,452,993</u>
	Net Material Manufacturing Variance			\$ <u>764,333</u>
	Total Material Issued	\$ <u>13,644,028</u>		

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Wilmington Heavy Repair Shops  
Metroliner Material Returned to Manufacturers  
Under Warranty during 1970

Westinghouse Electric

<u>Material</u>	<u>Reference No.</u>	<u>Quantity</u>
Traction Motor	25-522770	62
Motor Alternator	25-519172	10
Smoothing Reactor	25-617638	4
Main Transformer		6
Motor Alternator	25-519173	1
Auxiliary Smoothing Reactor	25-617448	1
Pump Motor Housing for Main Transformer		1

General Electric

Main Transformer	25-877604	8
Main Smoothing Reactor	25-617646	19
Pyranol Pump S/W 44	25-613215	1
Traction Motor	25-522952	3

Other Manufacturers

Center Device Cylinders A/C 20		6
Bellofram Diaphragm Air Cylinders Type S Size 9, Serial F, Rd sm Lot M32		7
Coil Springs A for Bolster	16-236950	23
Freon Compressor		1
Pirelli Springs	16-745281	7
Shock absorber		10
Pentograph		
Inner Coil Bolster Springs	16-236968	6
Shock absorber links	20-386593	3

CAPITALIZED TRACK AND ROADBED IMPROVEMENT COST  
(I.C.C. ACCOUNTS 80 AND 1 THROUGH 47)

Significant Maintenance of Way costs, particularly those to upgrade catenary, roadbed and track, were incurred to provide for the higher operating speed of the Metroliner operation. This upgrading cost has been partially capitalized in I.C.C. accounts 80 and 1 through 47. The objective of this study was to determine the most equitable method of allocating the actual expenditures incurred in 1970 for track and roadload improvements in the Northeast Corridor to the Metroliner operations and, if necessary, to other operations in order to arrive at a fully allocated Maintenance of Way expense for the year. This section of the report discusses the background for the study and the methodology used in developing the allocation.

BACKGROUND

With the inception of the Northeast Corridor Demonstration Project in 1966, the Pennsylvania Railroad established the following accounting policy:

"All costs, whether paid by the P.R.R. or a governmental agency, incident to the upgrading of existing facilities and the construction of new facilities to provide the required facilities for the Demonstration Project shall be recorded in the project details by Responsibility Center, Work Order, Cost Center where required, Purpose Account and Class Code.

All costs must be completely identified with the Demonstration Project in accordance with agreements with the governmental agencies involved and must be within the general grouping of categories approved by the I.C.C. for recording in Account 731-Road & Equipment Property, Primary Accounts 1-47 and Account 80-Other Elements of Investment."

(a) Account 80 - Other Elements of Investment

The Uniform System of Accounts for Railroad Companies as Prescribed by the Interstate Commerce Commission states, "This account shall include elements of investments in property not includable in other primary property accounts." This account has been used to record certain expenses incident to the Demonstration Project. If the I.C.C. had not recognized this accounting

classification and given PC permission to use it in connection with the Demonstration Project, these expenditures would have been classified as routine Maintenance of Way expenses. As of December 31, 1970, gross expenditures of approximately \$39 million had been charged to account 80. These charges had been reduced by reimbursements of approximately \$8.3 million from various agencies. Major gross expenditures include the following:

<u>Description</u>	<u>Amount</u> <u>(in millions)</u>
Raise track and install ties	\$ 11.4
Rail installation	19.3
Additional surfacing and lining of track	3.7
Installation of switch timber	1.1

(b) Accounts 1-47 - Road and Equipment Property

The primary accounts 1 through 47 provide a general classification of capitalized road and equipment property. Expenditures incident to the Corridor were summarized separately for reporting purposes. As of December 31, 1970, gross expenditures of approximately \$14.5 million and reimbursements of approximately \$1.7 million had been recorded. The major gross expenditures are as follows:

<u>I.C.C. Account #</u>	<u>Description</u>	<u>Amount</u> <u>(in millions)</u>
9	Rails	\$1.3
16	Station and office buildings	2.7
27	Signals and interlockers	2.1
31	Power-transmission systems	5.5

METHODOLOGY

The purpose of this study was to determine how much of the costs charged to accounts 80 and 1-47 for work done in the Northeast Corridor should be considered as a cost of operating the studied conventional trains and the Metroliners in 1970.

In performing this study, heavy reliance was given to the technical advice of Louis T. Klauder and Associates, an engineering consulting firm, presently under contract with the Department of Transportation to evaluate Maintenance of Way and Structures (M of W & S) expenses attributed to the Demonstration Project. Their approach has been to classify M of W & S expenditures, on the basis of the description of the expenditure, into incremental and normal categories.

(a) Normal Expenditures

Normal expenditures are described as expenditures of a routine nature which are part of an ongoing maintenance program. The four major types of normal expenditures found in the charges to account 80 and to accounts 1-47 are:

- . Install rail
- . Raise track and install ties
- . Install switch timbers
- . Reformed bars and welding

The account 80 expenditures in 1970 classified as normal are shown in Exhibit C-1.1 while normal accounts 1-47 expenditures are shown in Exhibit C-1.2.

While no expenditures for work of this type were incurred during the last three months of 1970, the period which Klauder was analyzing in detail, this type work is similar to welded rail installation, which is now being analyzed. Present indications are that agreement will be reached to allow a charge of 30% of the direct labor and of the reduced additive (fringe benefit). The allowable additive rate will be 30.2% of direct labor. Based on this approach, the amount of normal charges to accounts 80 and accounts 1-47, which should be charged solely to Metroliner operations, were calculated.

These calculations, which resulted in \$298,546 of 1970 normal account 80 charges and \$297 of the normal accounts 1-47 charges being charged to Metroliner operations, are shown in Exhibit C-2.1 and Exhibit C-2.2, respectively.

As part of our decision to accept Klauder's approach, new rail installation in the Northeast Corridor was analyzed. Rail has an estimated life of from 20 to 30 years. An ongoing maintenance program would suggest that a section of rail would be replaced within that time period or that 2.50% to 3.33% of the total operating track in the Corridor would be replaced every year. Exhibit C-3 shows the miles of welded rail installation in the Corridor as a percentage of total Northeast Corridor operating track miles since 1956. Prior to 1966 the low rate of rail installation gives indication that routine maintenance was being deferred. Consequently, it is logical to assume that some of the charges made to accounts 80 and 1-47 represented routine maintenance charges deferred from prior periods and thus were not incurred solely because of Metroliner operations.

(b) Incremental Expenditures

Expenditures were defined as incremental if they were incurred to meet higher track specifications required for Metroliner operations. The incremental expenditures charged to account 80 in 1970 are listed in Exhibit C-1.1 while those charged to accounts 1-47 are listed in Exhibit C-1.2.

As part of its contract with the Department of Transportation, Louis T. Klauder and Associates has reviewed the expenditures which Penn Central has charged to the Demonstration Project in the last three months of 1970. These expenditures are of the type which Klauder has defined as incremental. As with the normal expenditures, the additive was reduced to 30.2% of direct labor. After detailed analysis and lengthy discussions, 67.9% of the incremental expense charged by PC to the Demonstration Project in the last three months of the year was allowed as solely Metroliner related expense. A summary of this analysis is shown in Exhibit C-4.



We believe that there is a parallel between the expenditures charged to accounts 80 and 1-47 during the first 9 months of 1970 and classified as incremental and the expenses which Penn Central has charged to the Demonstration Project during the last 3 months of the year and Klauder has reviewed in detail. Consequently, we have allowed 67.9% of the expenditures charged to accounts 80 and 1-47 during the first 9 months of 1970 and classified as incremental as expenses related solely to Metroliner operations. These calculations resulted in a charge of \$468,377 of those account 80 expenditures classified as incremental and a charge of \$773,462 of those accounts 1-47 expenditures classified as incremental to Metroliner operations. The derivation of these charges is shown in Exhibit C-2.1 and Exhibit C-2.2.

(c) Other Expenditures Related to Metroliners

It is acknowledged that the expenditures charged to accounts 80 and 1-47 were incurred for maintenance of the Northeast Corridor. Since all rail services utilize the Corridor, the disallowed cost was allocated to all services on the basis of gross ton-miles. The Office of Chief Engineer-System Maintenance of Way provided a 1969 study entitled, Estimated Annual Million Gross Tons Traffic Per Mile. From this traffic density study, a timetable was used to convert these statistics to Corridor gross ton-miles. The ratio of Metroliner gross ton miles to Northeast Corridor gross ton miles was determined to be .047. Exhibit C-5 summarizes the results by division. Applying this ratio to the allocable expenditures, an additional \$166,775 of 1970 account 80 expenditures and \$36,943 of accounts 1-47 expenditures were charged to 1970 Metroliner operations. These calculations are shown in Exhibits C-6.1 and C-6.2, respectively.

SUMMARY

As a result of the above analysis, \$933,698 of the expenditures incurred in 1970 and charged to account 80 were allocated as a cost of Metroliner service in 1970. An additional \$770,702 of expenditures charged to accounts 1-47 were charged to 1970 Metroliner operations. These charges are summarized in Exhibits C-6.1 and C-6.2. The total of the accounts 80 and 1-47 expenditures charged to Metroliner operations, \$1,704,400, is included as a direct Maintenance of Way and Structure Cost of Metroliner operations in the Phase II study of the New York-Washington fully allocated cost of rail passenger service.

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Account 80 Expenditures - 1970

	<u>Total</u>	<u>Labor</u>	<u>Additives</u>	<u>Other</u>
<u>Normal Expenditures:</u>				
Install Rail	\$ 2,326,796	353,618	291,859	1,681,319
Raise Track and Install Ties	1,095,126	364,881	307,371	422,874
Install Switch Timbers	76,765	33,280	28,733	14,752
Reformed Bars and Welding	43,092	12,547	10,928	19,617
	<u>3,541,779</u>	<u>764,326</u>	<u>638,891</u>	<u>2,138,562</u>
<u>Incremental Expenditures:</u>				
Additional Surfacing and Lining of Track	636,901	247,539	209,175	180,187
Modify Trolley Section Breaks	58,246	8,463	6,566	43,217
Grade Contact Wire-Overhead Bridge	43,403	19,367	16,983	7,053
New Passenger Station, Lanham, Maryland	27,889	23	20	27,846
Other	7,105	3,741	3,046	318
	<u>773,544</u>	<u>279,133</u>	<u>235,790</u>	<u>258,621</u>
Totals	\$ <u>4,315,323</u>	<u>1,043,459</u>	<u>874,681</u>	<u>2,397,183</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Accounts 1-47 Expenditures - 1970

	<u>Total</u>	<u>Labor</u>	<u>Additives</u>	<u>Other</u>
<u>Normal Expenditures:</u>				
Install Rail	\$ 312,652	192	109	312,351
Other	5,041	568	483	3,990
	<u>317,693</u>	<u>760</u>	<u>592</u>	<u>316,341</u>
 <u>Incremental Expenditures:</u>				
Upgrade and Construct Inspection Pits	642,246	16,866	7,014	618,366
Install Heavy Trolley Wire	271,187	85,252	66,221	119,714
Upgrade and Construct Passenger Stations	262,422	22,551	17,914	221,957
Modify Circuit Breakers for Substations	43,804	1,570	1,215	41,019
Additions and Alterations to Public Crossings	22,603	6,561	6,031	10,011
Switch Heaters	16,366	4,345	3,812	8,209
Additional Surfacing and Leveling of Track	8,338	930	800	6,608
Other Expenditures	9,805	2,965	2,559	4,281
Adjustment for Construction of Power Ramp for High Passenger Platform	(23,856)	-	-	(23,856)
Adjustment for Construction of High Passenger Platform	(50,823)	-	-	(50,823)
	<u>1,202,092</u>	<u>141,040</u>	<u>105,566</u>	<u>955,486</u>
Totals	\$ <u>1,519,785</u>	<u>141,800</u>	<u>106,158</u>	<u>1,271,827</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Account 80 Expenditures  
Allowed as Direct Cost of Metroliner Operations - 1970

	<u>Total</u>	<u>Labor</u>	<u>Additive</u>	<u>Other</u>
Normal Expenditures	\$ 3,541,779	764,326	638,891	2,138,562
Less: Reduction of Additives to Fringe Benefit Rate of 30.2%	<u>408,065</u> 3,133,714	<u>-</u> 764,326	<u>(408,065)</u> 230,826	<u>-</u> 2,138,562
Percentage of Expenditures Attributed to Metroliner Operations		<u>30%</u>	<u>30%</u>	
Expenditures Allowed for Metroliner Operations	\$ <u>298,546</u>	<u>229,298</u>	<u>69,248</u>	<u>-</u>
Incremental Expenditures	\$ 773,544	279,133	235,790	258,621
Less: Reduction of Additive to Fringe Benefit Rate of 30.2%	<u>(83,740)</u> 689,804	<u>-</u> 279,133	<u>(83,740)</u> 152,050	<u>-</u> 258,621
Percentage of Allowed Corridor Expenditures as Determined by Independent Review	<u>67.9%</u>	<u>67.9%</u>	<u>67.9%</u>	<u>67.9%</u>
Expenditures Allowed for Metroliner Operations	\$ <u>468,377</u>	<u>189,531</u>	<u>103,242</u>	<u>175,604</u>
Total Expenditures Allowed for Metroliner Operations (carried forward to Exhibit C-6.1)	\$ <u>766,923</u>	<u>418,829</u>	<u>172,490</u>	<u>175,604</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
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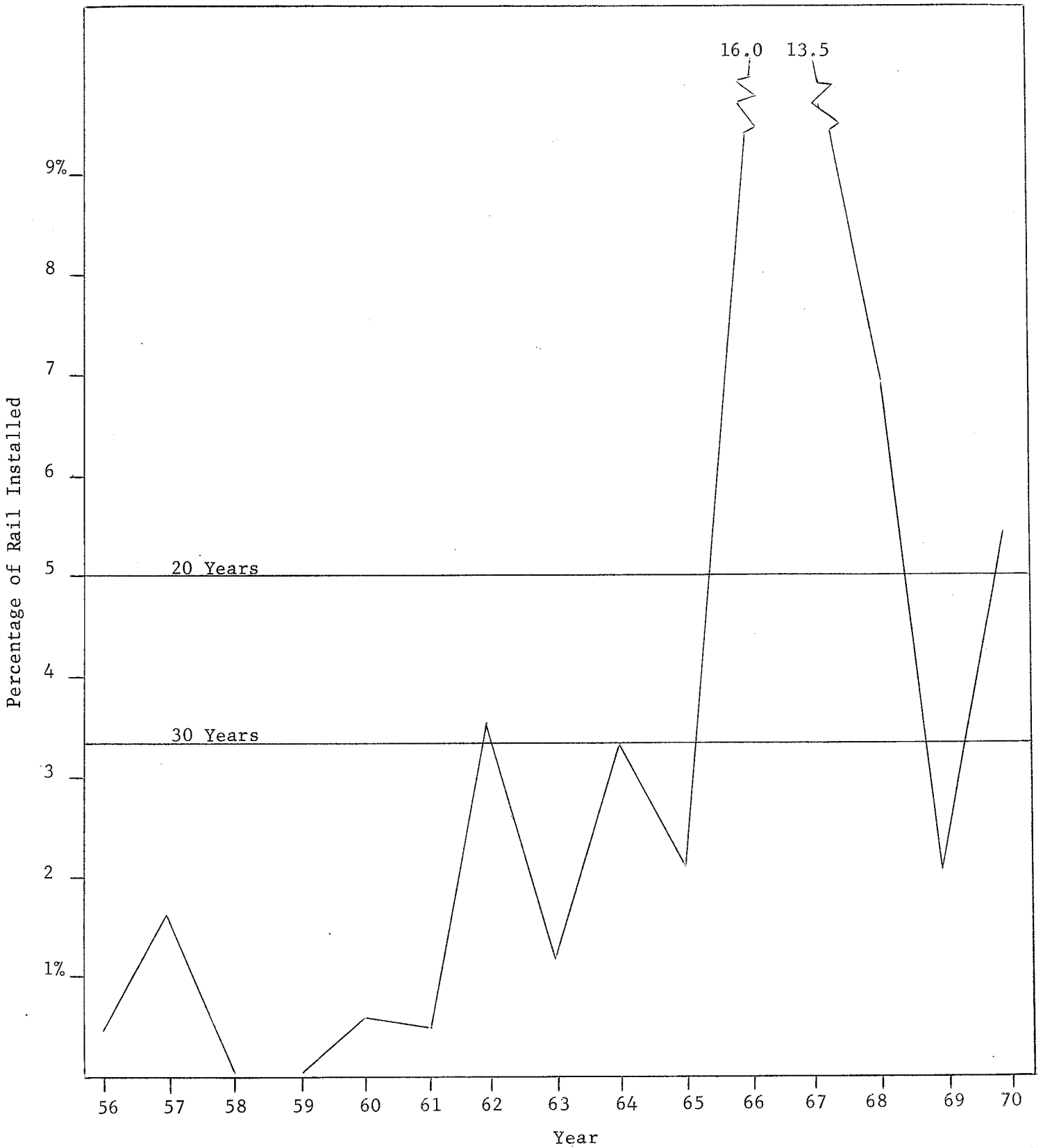
Summary of Accounts 1-47 Expenditures  
Allowed as Direct Cost of Metroliner Operations - 1970

	<u>Total</u>	<u>Labor</u>	<u>Additive</u>	<u>Other</u>
Normal Expenditures	\$ 317,693	760	592	316,341
Less: Reduction of Additive to Fringe Benefit Rate of 30.2%	<u>(362)</u>	<u>-</u>	<u>(362)</u>	<u>-</u>
	\$ <u>317,331</u>	<u>760</u>	<u>230</u>	<u>316,341</u>
Percentage of Expenditures Attributed to Metroliner Operations		<u>30%</u>	<u>30%</u>	
Expenditures Allowed for Metroliner Operations	\$ <u>297</u>	<u>228</u>	<u>69</u>	
Incremental Expenditures	\$ 1,202,092	141,040	105,566	955,486
Less: Reduction of Additive to Fringe Benefits Rate of 30.2%	<u>(62,972)</u>	<u>-</u>	<u>(62,972)</u>	<u>-</u>
	1,139,120	141,040	42,594	955,486
Percentage of Allowable Corridor Expenditures as Determined by Independent Review	<u>67.9%</u>	<u>67.9%</u>	<u>67.9%</u>	<u>67.9%</u>
Expenditures Allowed for Metroliner Operations	\$ <u>773,462</u>	<u>95,766</u>	<u>28,921</u>	<u>648,775</u>
Total Expenditures Allowed for Metroliner Operations (carried forward to Exhibit C-6.2)	\$ <u>733,759</u>	<u>95,994</u>	<u>28,990</u>	<u>648,775</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Exhibit C-3

Welded Rail Installation As A Percentage of Total  
Operating Track Miles\*  
For the Years 1956 to 1970



\*No Bolted Rail Installed

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Incremental Corridor Expense  
As Determined by Independent Review - 1970

	<u>Totals</u>	<u>October</u> <u>1970</u>	<u>November</u> <u>1970</u>	<u>December</u> <u>1970</u>
New Jersey Division				
Track	\$ 113,502	40,384	52,034	21,084
Communications and Signals	-	-	-	-
Electric Traction	255	202	53	-
Structures	-	-	-	-
Totals	<u>113,757</u>	<u>40,586</u>	<u>52,087</u>	<u>21,084</u>
Philadelphia Division				
Track	50,467	23,753	12,811	13,903
Communications and Signals	-	-	-	-
Electric Traction	6,063	2,300	345	3,418
Structures	-	-	-	-
Totals	<u>56,530</u>	<u>26,053</u>	<u>13,156</u>	<u>17,321</u>
Chesapeake Division				
Track	88,941	54,778	25,934	8,229
Communications and Signals	20	20	-	-
Electric Traction	48	-	48	-
Structures	-	-	-	-
Totals	<u>89,009</u>	<u>54,798</u>	<u>25,982</u>	<u>8,229</u>
Corridor Totals	\$ <u>259,296</u>	<u>121,437</u>	<u>91,225</u>	<u>46,634</u>
Corridor Expense Allowed	259,296	121,437	91,225	46,634
Corridor Expense Disallowed	<u>122,840</u>	<u>61,742</u>	<u>38,869</u>	<u>22,229</u>
Corridor Expense Reported	\$ <u>382,136</u>	<u>183,179</u>	<u>130,094</u>	<u>68,863</u>
Corridor Expense Allowed	<u>67.9%</u>	<u>66.3%</u>	<u>70.1%</u>	<u>67.7%</u>



FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Estimated Gross Ton-Miles  
Northeast Corridor (Washington, D. C. - New York) - 1970

	<u>Distance</u> <u>(Miles)</u>	<u>Gross Ton-</u> <u>Miles</u> <u>(000,000)</u>
Chesapeake Division	130.8	5,112.33
Philadelphia Division	39.8	2,140.88
New Jersey Division	<u>54.0</u>	<u>2,779.68</u>
Totals	<u>224.6</u>	<u>10,032.89</u>

<u>Metroliner Gross Ton-Miles</u>	<u>476,484,360</u>	
Northeast Corridor Gross Ton-Miles	10,032,890,000	= <u>4.7%</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Account 80 Expenditures  
Allowed as Direct Cost of Metroliner Operations - 1970

	<u>Total</u>	<u>Labor</u>	<u>Additive</u>	<u>Other</u>
Normal Expenditures	\$ 3,541,779	764,326	638,891	2,138,562
Incremental Expenditures	<u>773,544</u>	<u>279,133</u>	<u>235,790</u>	<u>258,621</u>
	4,315,323	1,043,459	874,681	2,397,183
Less: Expenditures Allowed for Metroliner Operations	<u>766,923</u>	<u>418,829</u>	<u>172,490</u>	<u>175,604</u>
Expenditures to be Allocated	3,548,400	624,630	702,191	2,221,579
Estimated Ratio of Metroliner Gross Ton-Miles to Total Corridor Gross Ton-Miles	<u>.047</u> 166,775	<u>.047</u> 29,358	<u>.047</u> 33,003	<u>.047</u> 104,414
Add: Expenditures Allowed for Metro- liner Operations	<u>766,923</u>	<u>418,829</u>	<u>172,490</u>	<u>175,604</u>
Total Account 80 Expenditures Allowed as Direct Cost of Metroliner Operations	\$ <u>933,698</u>	<u>448,187</u>	<u>205,493</u>	<u>280,018</u>

FULLY ALLOCATED COST OF NEW YORK-WASHINGTON  
RAIL PASSENGER SERVICE - PHASE II

Summary of Accounts 1-47 Expenditures  
Allowed as Direct Cost of Metroliner Operations - 1970

	<u>Total</u>	<u>Labor</u>	<u>Additive</u>	<u>Other</u>
Normal Expenditures	\$ 317,693	760	592	316,341
Incremental Expenditures	<u>1,202,092</u>	<u>141,040</u>	<u>105,566</u>	<u>955,486</u>
	1,519,785	141,800	106,158	1,271,827
Less: Expenditures Allowed for for Metroliner Operations	<u>733,759</u>	<u>95,994</u>	<u>28,990</u>	<u>648,775</u>
Expenditures to be Allocated	786,026	45,806	77,168	623,052
Estimated Ratio of Metroliner Gross Ton-Miles to Total Corridor Gross Ton-Miles	<u>.047</u> 36,943	<u>.047</u> 2,153	<u>.047</u> 3,627	<u>.047</u> 29,283
Add: Expenditures Allowed for Metro- liner Operations	<u>733,759</u>	<u>95,994</u>	<u>28,990</u>	<u>648,775</u>
Total Accounts 1-47 Expenditures Allowed as Direct Cost of Metro- liner Operations	\$ <u>770,702</u>	<u>98,147</u>	<u>32,617</u>	<u>678,058</u>