

A  
Revenue Report  
For  
Portland's  
Transportation  
System

April 1987

Marian Glick

A REVENUE REPORT FOR PORTLAND'S TRANSPORTATION SYSTEM

PREPARED FOR  
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## Portland's Transportation System Need Compared with Resources

The Portland Office of Transportation (PDOT) began in 1985 an evaluation of its transportation repair and preservation system needs. A report on the status and condition of transportation facilities is published annually. Each transportation facility inventory is described and its present condition is identified along with unmet needs.

Concurrently, PDOT has analyzed current sources of funding, options for increasing these sources, and creating new sources to meet transportation service needs.

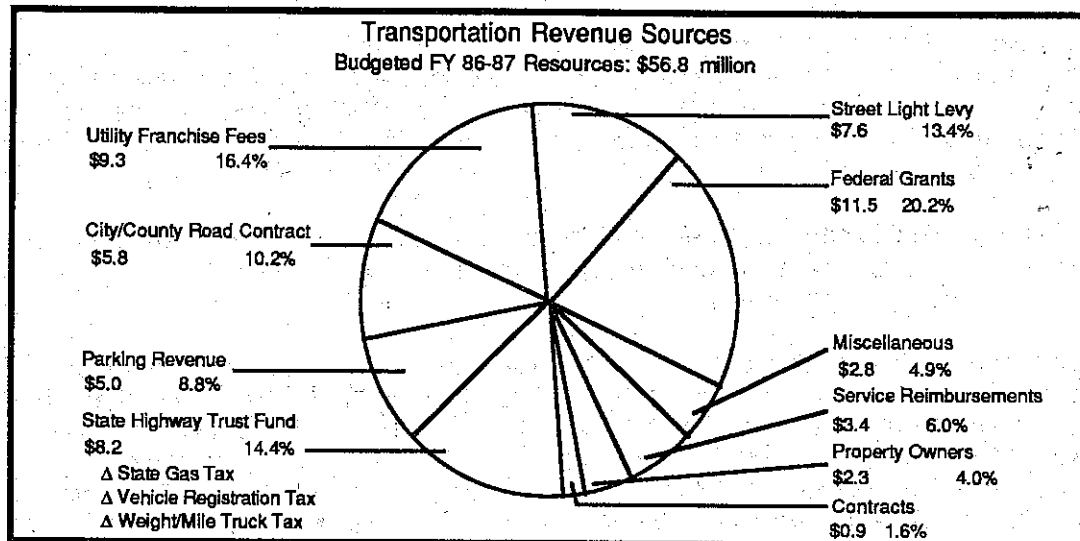
A state-wide assessment of transportation service needs and resources has recently been conducted by the League of Oregon Cities, Association of Oregon Counties and the Oregon Department of Transportation. The framework for this assessment was the division of transportation services into three work categories that take into consideration the need to maintain and preserve the existing road system: operations and maintenance, repair and preservation and construction and expansion. PDOT's analyses of service levels and resources contained in this report are consistent with the state's definitions of these work categories.

The operations and maintenance (O&M) category includes routine upkeep activities and the safe and efficient movement of traffic. Pothole patching, ditch, culvert, storm sewer cleaning, litter pickup, mowing of median strips, signal, street light, and pavement marking maintenance, painting, deck and rail repair of bridges are examples.

The repair and preservation (R&P) category includes the repair, restoration and resurfacing of existing facilities to extend the design life of a facility. Resurfacing alone or with any combination of minor widening, bridge and retaining wall repair, signal and street light replacement and traffic modifications qualify as repair and preservation work activities.

The construction and expansion (C&E) category is for work activities that involve the reconstruction, improvement, and expansion of existing facilities to provide additional traffic capacity as well as the construction of new facilities.

## Portland Does Not Have Stable Sources of Funding Dedicated to Transportation



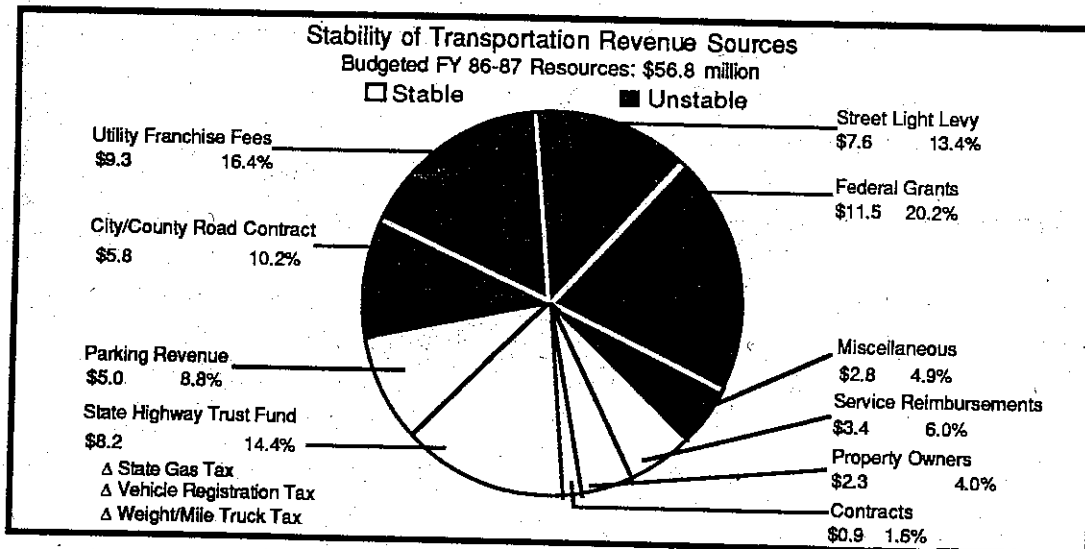
Thirty-five percent of transportation's current \$56.8 million budget, or \$19.8 million, are stable sources:

- The State Highway Trust Fund has been and will continue to be the single most reliable source of dedicated transportation funds. It provides fifteen percent of current annual revenues.
- Parking revenue is dedicated to transportation by city ordinance. It provides nine percent of annual revenues and is expected to continue to generate about \$5 million per year.
- Property owners (Local Improvement Districts), cost/recovery and contract revenues cover the cost of work performed and therefore will increase or decrease depending on specific work activities and will not affect overall resource shortfall.

Sixty-five percent of current revenues, or \$37 million, are unstable sources:

- The City/County Road Contract is in question given recent legal decisions regarding annexation methods. It is also subject to negotiations between the city and the county. In fiscal year 86-87, ten percent of transportation's budget comes from this source.
- Transportation's percentage of the utility franchise fee is determined annually by City Council. The percentage of the fee devoted to transportation has decreased from 80 percent in 1983 to 32 percent in 1987. Sixteen percent of transportation's budget comes from this source.
- The street light levy provides thirteen percent of the current transportation budget. The levy expires July 1988.
- Federal grants represent twenty percent of the current budget. Grant funds have been a key source of revenue for capital improvements. The major source of grant funds are Federal Interstate Withdrawal (FAIX) funds. These funds are scheduled to be expended by 1990.
- Miscellaneous includes interest earnings and the beginning fund balance representing 5 percent.

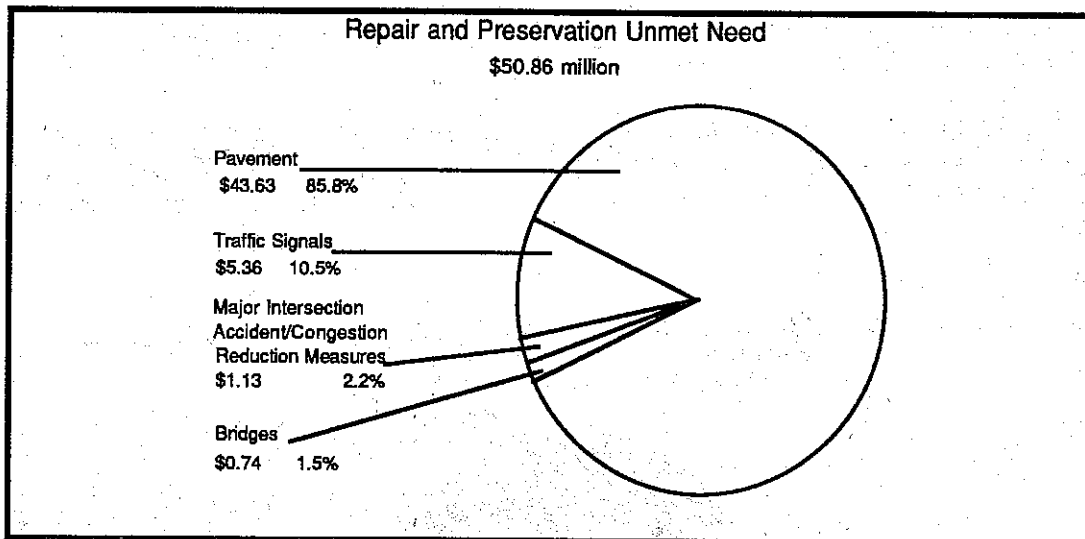
With sixty percent of the current budget coming from unstable sources, it is difficult to plan for meeting future transportation needs. In addition, existing revenue is inadequate to meet current and projected need.



## Current Resources are Inadequate to Meet Needs

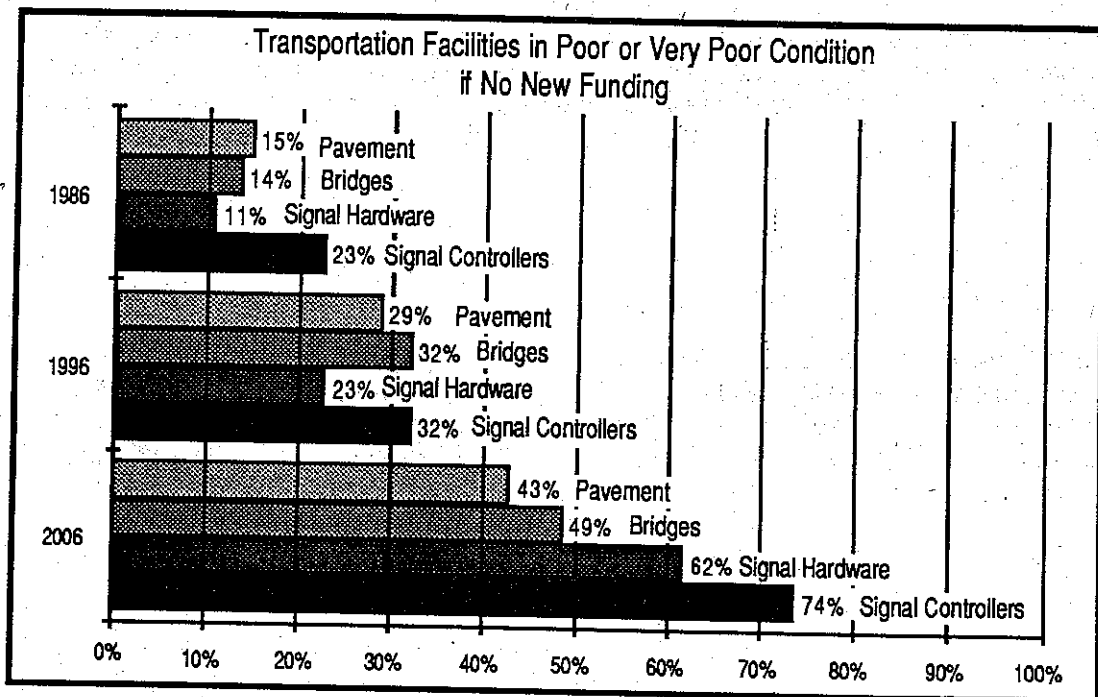
### Repair and Preservation

The 1987 annual Status and Condition Report assesses the condition of all transportation facilities except drainage, curbs, sidewalks and traffic signs. To efficiently manage transportation facilities, it is necessary to sustain the existing investment and level of service through maintenance and repair and replacement, thereby avoiding the much higher cost of reconstruction. If scheduled repair and preservation work is not performed due to lack of funds a "backlog" occurs. "Backlog" is a term used to represent the amount of identified work for which no funds are available. Another term used for "backlog" is unmet need. The condition analysis defines all facilities in poor or very poor condition as the unmet need. Fiscal year 86-87 unmet repair and preservation need is \$50.9 million.



There are 480 center-line miles of street in Portland that need surface treatment for which no funds are available. To bring this backlog of streets to good or better condition would require \$43.6 million. This represents 86 percent of the unmet need. To bring bridges in critical condition to good or better condition would require \$740,000. Traffic signal component replacement represents 11 percent of the unmet need. Modifications of high accident and high congestion intersections accounts for 2 percent of the unmet need. There is no current unmet need for street lights. This is due to the current dedicated street light levy which expires July 1988.

Portland's transportation system is in relatively good condition in large part due to the young age of the system and the prudent use of federal financing. However, the cost associated with that portion of the system in poor condition is very large. As the system ages and federal financing is no longer available, a larger portion of the system will begin to deteriorate unless new funding sources are developed.



- . Fifteen percent of the city's paved streets are in poor or very poor condition. This percentage will increase to 43 percent in 2006 due to annexation and an increase in the number of miles needing surface treatment.
- . Fourteen percent of bridges are in poor or very poor condition. The existing funding level is not sufficient to maintain bridges in their current condition. Almost half of the City's bridges will be in poor or very poor condition by 2006, if no new funds are secured.
- . Traffic signal condition is calculated for the two major components of signals: intersection hardware and signal controllers. Replacement occurs on a 25-year cycle for hardware and a 15-year cycle for controllers. A percentage of both components have recently been replaced with federal financing. If no new funds are secured within the next 15 to 25 years, 79 percent of the controllers and 62 percent of the intersection hardware will be in poor or very poor condition.

#### Operations & Maintenance

Portland has not documented its transportation operations and maintenance unmet need. However, there is an observable unmet need. For example, potholes exist in many streets presenting unsafe driving conditions. A systematic documentation is necessary to provide information on location and cost of unmet need. A State of Oregon needs assessment shows that cities are only meeting 60 percent of their operations and maintenance needs. Using this general assumption, unmet operations and maintenance needs for Portland are estimated to be \$13.5 million annually.

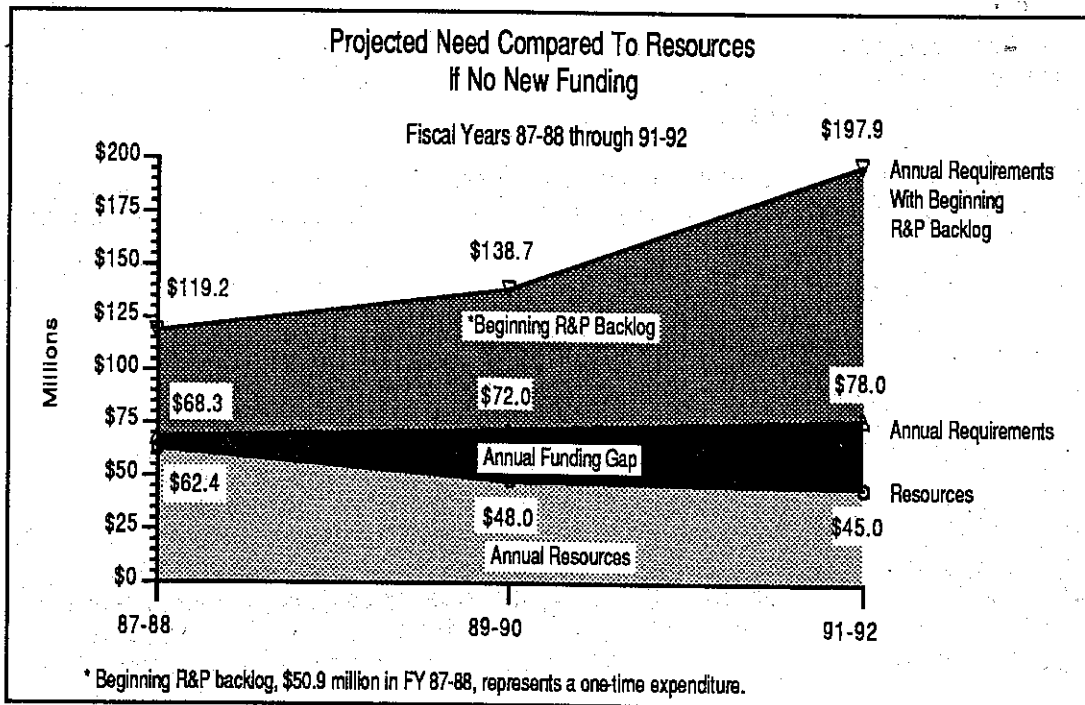
#### Construction and Expansion

Construction and expansion needs have been met largely through the Federal Interstate Withdrawal Program (FAIX). FAIX funds are scheduled to be expended by 1990, creating a need for new revenue to support construction and expansion. This is in addition to existing unfunded projects in the City's Capital Improvement Program.



## Additional Revenue is Necessary to Maintain Current Service Levels

New or increased resources are necessary to provide a stable source of revenue, replace revenue that will no longer be available through grants and the street light levy, and meet identified need. The revenue shortfall as a result of cumulative unmet repair and preservation need and maintaining current service level is shown for 1987 through 1992.



The funding gap between needs and resources will continue to grow if new resources are not secured. Acknowledgement of the need for predictable sources of revenue and sufficient funds to fill the gap between need and available resources led to an analysis of existing and new resource options. Options were evaluated according to legality, revenue adequacy, equity, public acceptance and ease of administration.

Existing revenue sources with the potential for providing increased revenue includes:

- . serial levy
- . state highway funds
- . federal funds
- . state and county gas tax
- . right-of-way charges
- . parking/storage charges
- . drainage fees

New revenue sources with the potential for providing new revenue includes:

- . public/private financing
- . lottery funds
- . state energy funds
- . city gas tax
- . user fees
  - street lighting
  - street cleaning
  - street maintenance
  - street operations
- . property tax increment financing

All options have their strengths and weaknesses. Difficult choices will need to be made to provide adequate funding for transportation services.

### A Transportation Financial Plan: The Next Step

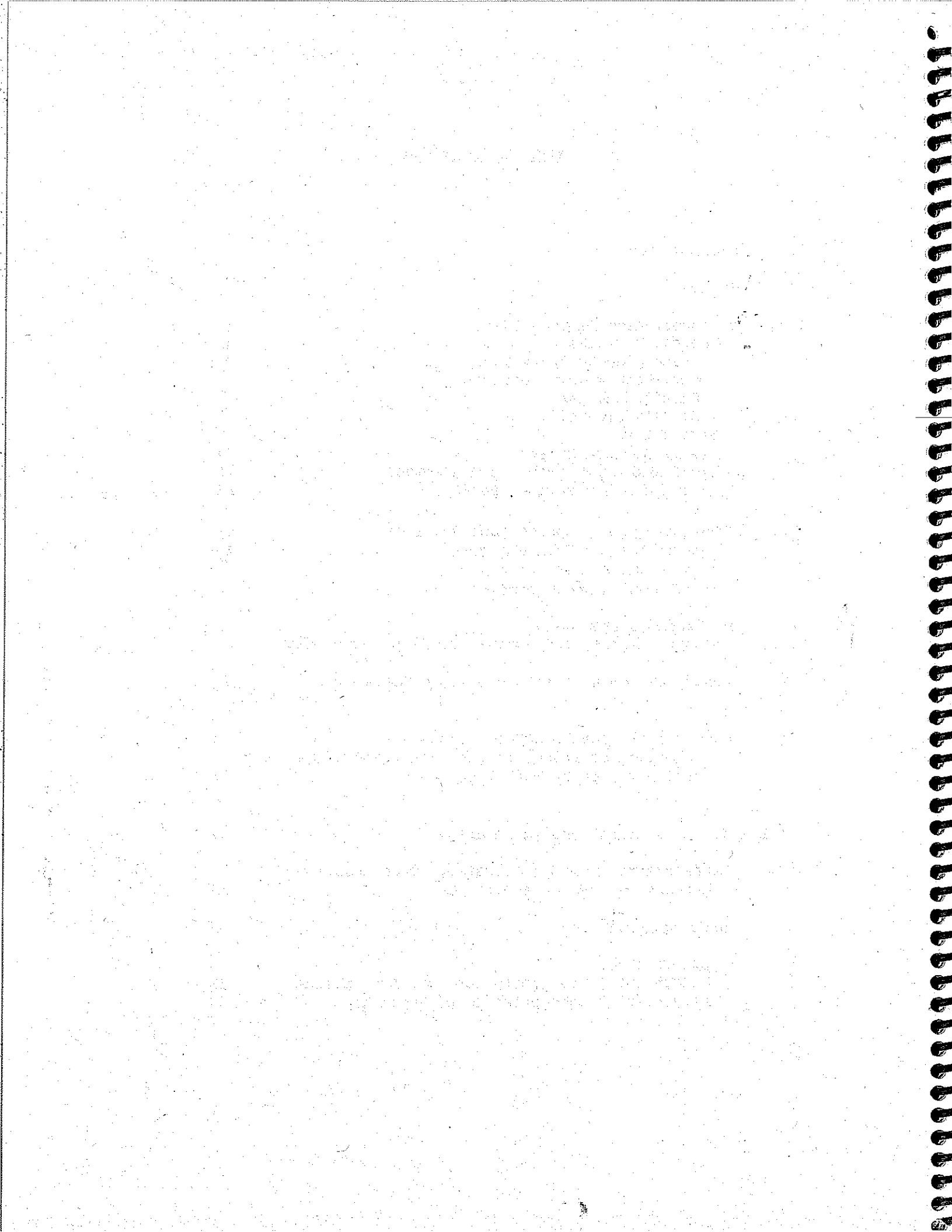
The city's transportation goal is to provide a safe, efficient and balanced transportation system that supports economic development, sustains existing businesses and enhances neighborhood liveability. The implementation of this goal requires a financial plan that provides adequate funding to: maintain and operate the existing transportation system at a level that prevents system deterioration; meet the unmet repair and preservation need of existing transportation facilities; and construct and expand capital facilities to support economic growth.

The financial plan must include a cost saving component that continues cost reduction measures. Technological advancements within transportation have been implemented resulting in cost reductions. Street lights have been converted to energy-efficient lights. Efficient pavement surface treatments have been implemented as technology has been developed. A pavement management system has been instituted that allows for efficient organizing and scheduling of work crews. Transportation management systems, which reduce demand on transportation facilities, have been put into place encouraging transit, rideshare and alternative transportation options.

The next step in developing a financial plan is to determine appropriate levels of service and then identify revenue options to be pursued. These are policy decisions that require consideration of revenue adequacy, equity, public acceptance and ease of administration. Operations and maintenance and construction and expansion needs should be documented to provide a complete picture of transportation unmet needs.

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## I. INTRODUCTION

The 1980's brought an awareness across the country of the need to identify the nation's infrastructure requirements and to develop methods to finance identified needs. In a September 1986 publication by the National Council on Public Works Improvement, Defining the Issues, it was noted that transportation improvements account for between two-thirds and three-fourths of required infrastructure funding.

There are a number of reasons given for the gap between transportation service needs and adequate funding. On the east coast most transportation facilities were built in the early 1900's and are aging. On the west coast the major interstates were built in the 1960's and 1970's. Facilities were built for less use than they are receiving. Federal infrastructure financing programs, for the most part, excluded transportation maintenance activities. The emphasis on capital projects resulted in deferring the maintenance and repair of existing facilities due to lack of funds.

Early needs assessments consisted of lists of capital projects and maintenance activities that would bring transportation systems to full design standard condition. Recent needs studies have moved from wish lists of all possible capital projects to assessments that are based on alternative service levels. These assessments allow decision makers and the public to make funding decisions based on the quality of life that the community is willing to pay for. To make informed decisions, an accurate statement of system requirements and costs must be available, along with possible options to pay for these requirements.

As a part of this effort to identify system requirements and resources, the Portland Office of Transportation (PDOT) began in 1985 a comprehensive evaluation of its transportation system needs. Portland's needs assessment is performance-based and provides alternative service levels instead of relying on full design standards as the only service level.

Concurrently with this effort, PDOT identified revenue options to provide sources of funding to match system requirements. A comprehensive look at PDOT's current sources of funding and potential options for future funding has recently been completed.

In another effort to document transportation service needs, the League of Oregon Cities, Association of Oregon Counties and the Oregon Department of Transportation conducted a Road Finance Study in 1986 entitled Making The Right Turn: Protecting The Public Investment In Oregon's Roads and Bridges. The Oregon Road Finance Study makes a strong case for the need for increased revenue. The study states that Oregon's "aging system of roads and bridges operated by the cities, counties and the State of Oregon is deteriorating, more and more rapidly". This deterioration is due to the deferral of maintenance and reconstruction work, and increased use.

The Road Finance Study is a state-wide assessment of transportation requirements. The framework for this assessment was the division of transportation services into three work categories that take into consideration the necessity to maintain and preserve the existing road system: Operations and Maintenance, Repair and Preservation, and Construction and Expansion.

The Operations and Maintenance (O&M) category includes routine upkeep activities and the safe and efficient movement of traffic. Pothole patching, ditch, culvert, storm sewer cleaning, litter pickup, mowing of median strips, signal, street light, and pavement marking maintenance, painting, deck and rail repair of bridges are examples.

The Repair and Preservation (R&P) category includes the repair, restoration and resurfacing of existing facilities in order to extend the design life of a facility. Resurfacing alone or with any combination of minor widening, shoulder improvements, alignment improvements, and bridge and retaining wall repair qualify as R&P work activities.

The Construction and Expansion (C&E) category is for work activities that involve the reconstruction and expansion of existing facilities to provide additional traffic capacity as well as the construction of new facilities.

As a part of the study, city, county and state-level transportation departments used these work categories to delineate present and future requirements.

The following analysis of PDOT's requirements and resources takes into account research at the national and state levels. Requirements are delineated for different service levels and categorized into O&M, R&P and C&E work activities. Current resources are defined and their stability discussed. New resource options are analyzed. A revenue strategy for transportation services is presented.

## II. HISTORY

The City of Portland's transportation system, like other urban systems, consists of a street system with paved streets, sidewalks, curbs, storm water drainage, traffic control devices, street lights, parking spaces, bridges, retaining walls, guardrails and stairways. How well this system works to serve the public and commerce is determined by its condition and use.

The history of transportation funding is an essential component in understanding the fiscal and physical conditions of Portland's transportation system. Funding availability, restrictions and the timing of funds have shaped Portland's transportation facilities and continue to determine condition. Federal funding has played a significant role.

"The Federal government built some postal roads along the Eastern Seaboard in the 1700's to serve areas otherwise inaccessible. However, despite ambitious Federal road planning and sporadic funding in the early 1800's, most public roads were built by counties and townships or by private turnpike companies until the beginning of the twentieth century. State aid for highways began in the 1890's and established the basis for the Federal aid that started in 1916. Federal highway grants have been made available to the states since then on a matching basis; this form of assistance was expanded significantly by the Federal-Aid Highway Act of 1956 which added the 41,000 mile National System of Interstate and Defense Highways (with its 90 percent federal funding) to the extensive primary, secondary, and urban systems". Defining The Issues

Transportation funding in Portland parallels this national picture. Rapid population growth and expansion of City boundaries occurred through annexation in the early 1900's. According to a 1986 Bureau of Maintenance report, A Historical Review of the Current Condition of Portland's Street Surfaces, the City of Portland funded its own street construction and maintenance until 1932. From 1932 until 1940, street construction was funded through the Federal Works Progress Administration in Portland.

In 1931, the Oregon legislature created the Public Utilities Commission, and provided for extensive local authority over utilities operating in the public right-of-way. Following this, Portland adopted legislation that required utility companies to pay 3.5% of gross revenues. In 1985, this percentage was increased to 5%. In Portland these fees are paid to the General Fund with a portion allocated by the City Council to fund transportation activities. The amount received by the City increased from \$13.4 million in 1984 to \$29.7 million in 1987. Transportation's allocation declined from 80% of this total in 1985 to 32% in 1987.

In 1938, revenue from parking meters and fines became the first city revenue dedicated by ordinance for transportation purposes.

The 1940's brought about a change in financing street improvements. The Oregon State Legislature began distributing to cities and counties a percentage of the state gas tax. The gas tax was instituted at the state level in 1919 at one cent per gallon. It was increased to six cents per

gallon in 1940 with cities receiving 5%. This resource became Portland's source of street improvements and maintenance. The Commissioner of Public Works established an annual "street resurfacing program" based on the annual level of "gas tax" revenues.

In the period from 1946 to 1966, the transition from rail transit to buses and the automobile created a need for street widenings and resurfacing. The annual resurfacing program ranged from 7 to 14 miles.

In 1955, the first of three separate ten-year fixed amount street light levies was passed. This represents the only source of funds that has been dedicated to transportation capital and operations. This revenue is restricted to street lighting activities. In 1979, operating levies were limited by state statute to three years. A three year street lighting levy was passed in 1985 and will expire July 1, 1988. The reduction in operating levies from ten years to three years reduces the long-term reliability of this resource.

In 1971, the first annual street surface condition inventory for all types of streets was developed. According to the Street Surfaces report, it was estimated that "70 to 80 miles per year of resurfacing would be required for five years to restore the City streets to good condition. A 50 to 60 mile per year resurfacing program would be required thereafter to maintain the good condition". Portland has been unable to meet these goals resulting in work that has been identified for which no funds are available.

PDOT has explored and implemented a number of methods to extend the life of a street. Revenue Sharing funds became available in 1972-73, a portion of these funds was used to begin a program for "capping" oil gravel streets to reduce future maintenance. Also at this time, federal Comprehensive Employment Training Act funds were used to perform "sidestrip paving", another maintenance reduction activity. In 1977, slurry seal, a new technology for surface treatment, was implemented as an on-going street maintenance technique.

Federal transportation funds were used extensively from 1978 to date to fund transportation activities. They have been used to build major capital projects, replace traffic signals, improve traffic safety and congestion problems, pave arterial streets and to replace mercury vapor lights with energy efficient sodium vapor lights. Of the federal funds, 15% was spent on maintenance and restoration activities, the remaining 85% was spent on capital improvements. These funds are expected to be expended by 1990.

In 1984, an agreement was signed between the City of Portland and Multnomah County for an exchange of services and revenues resulting from urban growth in the County. All county roads inside city limits were transferred to the City of Portland, with accompanying revenues from the County's Road Fund. The agreement allowed for an increase in road revenues to Portland as the city annexed a larger percentage of the county's population and road miles. Recently the legality of the annexations have been challenged. This raises maintenance and funding questions central to the City/County Road Contract.

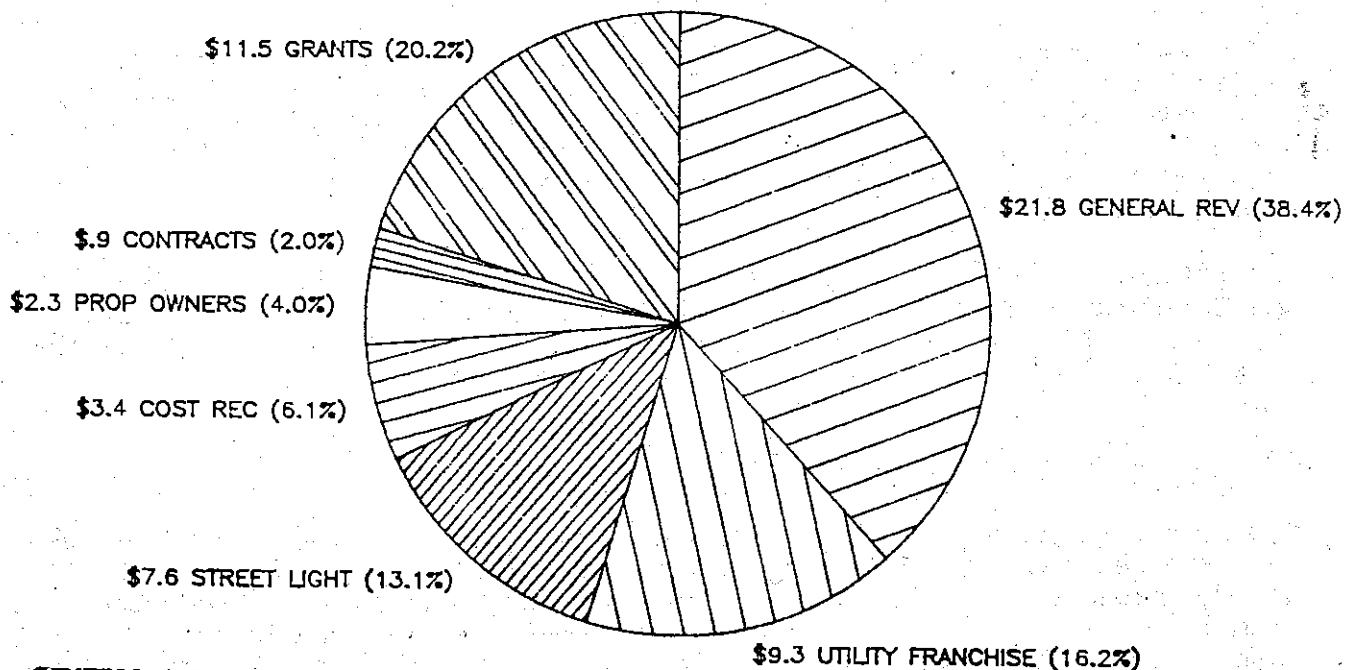


### III. TRANSPORTATION REVENUE SOURCES

Transportation services within Portland are funded through a number of different sources. In FY 1986-87, the most significant source of the \$56.8 million operating and capital budget was 55% from General Revenues. General Revenues consist of the State Highway Trust Fund, City/County Road Contract Fund, parking charges, utility franchise fees and miscellaneous resources. Utility franchise fee revenue is the only non-dedicated transportation general revenue, which is 16% of the current budget. All other general revenues are dedicated to transportation services. The second largest source of transportation revenue is Grants, which provide 20% of transportation's current budget. The Street Light Levy provides 13% of the current budget. All other revenue total 12% and are directly tied to reimbursable work activities. This chapter describes each transportation revenue and forecasts its stability.

#### TRANSPORTATION REVENUE SOURCES

BUDGETED FY 86-87 RESOURCES: \$56.8 MM



#### GENERAL REVENUES

General revenues are those revenues that are not associated with specific projects. They are discretionary revenues that can be used to fund non-reimbursable work activities. PDOT's general revenues consist of: State Highway Trust Fund, City/County Road Contract Fund, utility franchise fees, parking charges, and miscellaneous resources.

## State Highway Trust Funds

The State Highway Trust Fund includes the state gas tax, the state weight/mile tax and vehicle registration fees. The state gas tax is imposed by the legislature and collected statewide on a cents per gallon basis. An equivalent weight mile tax on trucks is also collected statewide. Both of these taxes, vehicle registration fees, and other miscellaneous revenues are put into the State Highway Trust Fund before being distributed to the Oregon Department of Transportation, the 36 Oregon counties, and 242 Oregon cities. The current formula distributes 68% of the first ten cents to the state, 20% to counties and 12% to cities. The remaining two cents is distributed 50% to the state, 30% to the counties and 20% to cities. In FY 86-87, Portland will receive about \$9.5 million from this fund. Of this amount, about \$8.2 will be placed in PDOT's budget, the remaining will go into a reserve fund. Fifteen percent of Portland's current transportation budget comes from this source.

The gas tax is not an inflation sensitive tax and, therefore, some of its purchasing power is reduced over time. In addition, the improved fuel efficiency of the overall auto and truck fleet tends to reduce consumption and collections. The Oregon Department Of Transportation projects no increase in funds over the next 20 years if all existing gas and weight mile taxes continue and no new new taxes are added. The existing 12 cents per gallon gas tax and equivalent weight mile tax would have to be increased if the revenue source were to keep up with inflation.

A proposal for an increase in the state gas tax, weight mile tax and vehicle registration fee is being developed through the Oregon Road Finance Study. Also under consideration is the implementation of a new vehicle titling fee. The study recommends that cities receive 20% of any increase. For each one cent equivalent increase to the State Highway Trust Fund, the City will receive about \$1.1 million.

In spite of its lack of inflationary growth, the State Highway Trust Fund is a stable source of road revenue. The funds are dedicated for road use in the Oregon Constitution. The constitution would have to be change by a vote of the people in order for funds to be used for a different purpose.

## City/County Road Contract

The Multnomah County Road Fund consists of the county gas tax, state gas tax and revenues from Forest Reserve Rentals. In 1984, Portland and Multnomah County agreed to an exchange of services and revenues resulting from urban growth in the county. One part of the agreement was the transfer of all county roads inside city limits to the City of Portland, with accompanying revenues from the County's Road Fund. The agreement allowed for an increase in road revenues to the city as the city annexed a larger percentage of the county's population and road miles. In 1986, a court ruling brought into question the legality of the process used for annexations. In FY 86-87, the city will receive approximately \$5.8 million from this fund. Ten percent of transportation's current budget comes from this source.

Another part of the agreement was to equalize the distribution of county gas tax funds. Seventy-percent of the county population lives within Portland city limits. Before the City/County Road Contract, county gas taxes paid by Portland residents were spent primarily outside city boundaries on county roads. County gas taxes are now distributed based on population and road miles.

The stability of this resource is contingent on two factors: the City/County Road Contract and the legality of annexations. If the City/County Road Contract was altered with regard to funds that the city receives, the revenues would change accordingly. If past and future annexations were found to be illegal, revenue projections would be decreased. Assuming that the annexations are found legal and the agreement holds, revenues will be \$9.3 million annually when annexation is complete. If the county increases its gas tax or receives increases from state revenues, then the city will realize an increase from these revenues. Likewise a decrease in the county or state revenues will mean a decrease in revenues to the city.

#### Parking Charges

Parking charges consist of parking meter collections and revenue from parking fines. Revenue from parking meters and parking fines is dedicated to transportation activities by city ordinance. Currently parking rates are on the average 50 cents an hour. Parking fines range from \$5 for exceeding the time limit to \$15 for parking in a no parking zone. Parking meter rates were last increased in 1982. Fines were last increased in 1980.

Portland receives all revenue from parking meters and receives 50% of the revenue from parking fines collected within the city. The State District Court receives the remaining 50% for processing and collecting fines. In FY 86-87, the City will receive \$3.5 million from parking meters and \$1.5 million from parking fines. Nine percent of transportation's current budget comes from parking charges.

It is assumed that revenues from meters and fines will remain at approximately \$5 million in future years unless meter rates or fines, enforcement or collections are increased significantly.

#### Utility Franchise Fees

Utility franchise fees are those fees which are assessed against utilities for their use of the public right-of-way. When utilities (gas, water, electric, sewer and telecommunication) make cuts in street pavement to bury or repair equipment, the pavement cut shortens the structural integrity and, therefore, the life of the street surface.

Effective October 1, 1985, the utility franchise fee was increased by the Portland City Council from 3.5% to 5% for private utilities. The city's water and sewer utilities pay a 7% fee.

Utility franchise fees are not dedicated to transportation services. These

fees are paid to the General Fund. Since the consolidation of all transportation services into the Portland Office of Transportation in FY 84-85, a portion of these revenues has been allocated to transportation activities:

#### DISTRIBUTION OF UTILITY FRANCHISE FEES

Fiscal Year	Total Received (in millions)	PDOT Receipts (in millions)	PDOT Percentage
83-84	\$13.4	Before PDOT	
84-85	14.9	\$11.9	80%
85-86	19.3	8.3	43
86-87	29.7	9.3	32

The total receipts from franchise fees to the city increased over the last four years. Transportation's share of these fees declined. While 80% of the original 3.5% utility franchise fee was transferred to PDOT now only 32% of the receipts is allocated to transportation. In FY86-87 PDOT received \$9.3 million from this source. Sixteen percent of transportation's current budget comes from the utility franchise fee.

For the purposes of this report, it is estimated that PDOT's portion of the utility franchise fee will continue at the \$9.3 million level, plus 4% inflation annually.

#### Miscellaneous Other

This general revenue includes interest earnings and the beginning fund balance. In FY 86-87, this source will amount to \$2.8 million.

#### SERIAL LEVY

The Street Lighting Levy is a three-year serial levy approved by the voters in 1985. All money from the levy is dedicated to street lighting expenses. In FY 86-87, this fund will provide \$6.5 million in revenue. In addition, \$1.2 million in miscellaneous Street Light Fund revenue is available. The Street Light Levy provides thirteen percent of transportation's current budget.

At the end of FY 87-88, the balance in the fund is estimated to be \$12 million. This amount could provide an additional 2 years of service. Beyond that point, there are no mechanisms currently in place to replace these funds. Although another three-year levy is technically possible, it must be approved by Portland voters.

It is assumed that no additional funds are available from this source beyond FY 87-88.

## GRANTS/REVENUE SHARING

There are several major sources of federal funds used within the city limits of Portland: Interstate construction, Interstate 4-R, and Primary program funds; Federal Aid to Urban Systems (FAU), and Federal Aid Interstate Transfer Withdrawal (FAIX). In FY86-87 \$11.5 million in grants will be received. Grants provide twenty percent of transportation's current budget.

The first source, Interstate construction, Interstate 4-R and Primary program funds are used for repair, reconstruction and improvements to state-owned roads. Portland has little or no control over these funds except through the Oregon Department of Transportation's six year plan. The state's road investment in the city is significant. All major corridors to downtown and three Willamette River bridges are the responsibility of the state. The interstate system includes two of the Willamette River bridges, the Banfield, I-5, I-405 circulation loop and I-205. The primary system is designed to carry traffic within the region and state. The primary system within Portland includes the lower Columbia River Highway (Highway 30), Powell Boulevard (Highway 26), Sunset Highway (Highway 26) and McLoughlin Boulevard (Highway 99E).

On a per mile basis, the interstate system is funded at a higher level than the state's primary system. Portland has a disproportionate share of the state's interstate construction and repair costs, because of its proportionately larger share of the state's interstate interchanges, mileage, and traffic volume. Consequently, the city's state road network is relatively well-maintained within the city because of the federal government's tendency to fund the interstate at a higher level than the primary highway system.

The Federal Highway Administration has proposed a bill which would create a block grant program combining the Interstate construction, Interstate 4-R and Primary programs. The effect of this block grant would be to give the state more flexibility in distributing Interstate construction and 4-R funds. It is anticipated that if the legislation were to pass, there would be a shift at the state level from funding the interstate system to funding primary roads.

The effect of this shift would not show up in the city's transportation budget. However, it would affect the condition of the portion of the city's transportation system that is maintained by the state. The state's FY 86-87 transportation budget within the city is \$52 million. This amount includes state and federal funds.

The second source of federal funds, Federal Aid to Urban Systems (FAU), is used for repair, reconstruction and improvement of urban streets on and off the state highway system. Over the past several years, Portland has received \$62,000 annually. These funds have returned to a pre-1978 level of approximately \$1.56 million annually. The FAU amount was lowered as part of an agreement with ODOT and the legislature when the Mt. Hood and I-505 freeways were withdrawn and funds exchanged for interstate transfer dollars. The FAU allocation of \$1.56 million should remain a reliable source of funding for capital projects on the FAU highway system for several years, although there have been proposals to eliminate the program. Within Portland the FAU system

includes all of the arterial streets and a portion of the major collectors. A six percent local match and a six percent state match is required for all funds received. The local match is allocated from Transportation's General Revenues.

The third source is the Federal Aid Interstate Substitution Program (FAIX or Interstate Withdrawal). In 1973, the federal government established a program for the withdrawal of planned interstate construction projects. In May 1976, the region and state agreed to withdraw the Mt. Hood freeway. In December 1979, the I-505 freeway was withdrawn. A total of \$500,630,204 was distributed within the region in the following manner:

#### DISTRIBUTION OF INTERSTATE WITHDRAWAL FUNDS

JURISDICTION	AMOUNT
Regional Hwy Priorities and Banfield LRT	\$ 269,214,695
Washington Co.	57,448,877
Clackamas Co.	48,332,781
Multnomah Co.	26,149,523
Portland	99,507,314
Total	\$500,653,204

Transit and road improvements are eligible for funding with FAIX money. Since 1977, Portland has utilized \$68.8 million. The remaining \$30.7 million has been programmed to specific projects. Construction will begin on these projects by 1989-90. Of the \$269 million allocated for the region, \$17 million is in a reserve for over-runs on regional projects. Some portion of this \$17 million reserve will eventually be allocated to Portland, although the exact amount is unknown. These funds are expected to be obligated by 1991, the last year of authorization for the program. FAIX funds require a fifteen percent local match. The local match is allocated from General Revenues.

There are several other federal programs that provide resources for transportation services in Portland. The Highway Bridge Replacement (HBR) program provides funds for the replacement of bridges. The state selects eligible projects and disburses funds. In FY 86-87, city projects will receive about \$500,000 for the first time.

Urban Mass Transit Authority (UMTA) Section 3 funds provide for transit capital projects. UMTA funds are not controlled by the city, however, they are important to note in an overall transportation resource analysis. Tri-Met administers the fund with approval through the Metropolitan Service District's Joint Policy Advisory Committee on Transportation (JPACT). UMTA discretionary capital funds within Portland are expected to total \$1.3 million in FY 86-87. In the UMTA Section 3 Trade program, \$12 million has been set-aside in a reserve fund for regional transit projects.

Housing and Community Development (HCD) Block Grant funds for transportation activities are site-specific to community development projects and are determined by HCD. HCD funds pay 85% of local road improvements. Property owners pay the remaining 15%. HCD transportation funds total approximately \$1.9 million for FY 86-87. The HCD program is scheduled to end in FY 89-90 with approximately \$1.6 million allocated for each of the next three years.

#### COST RECOVERY/SERVICE REIMBURSEMENT

PDOT provides a number of services that benefit only a small percentage of the public. Fees and charges have been established for these services on a cost recovery basis. In FY 86-87, \$3.4 million will be collected in service fees and charges.

Increases in this amount could occur through increases in existing charges for services or through implementing new service fees for existing services. It is estimated that the increased revenue will be minimal.

#### PROPERTY OWNERS

PDOT uses Local Improvement Districts (LID) to fund transportation improvements that benefit specific properties. The money that comes into the city from the property owners is used to retire bonds that were sold to finance their improvements. In FY 86-87, \$2.3 million is expected to be received.

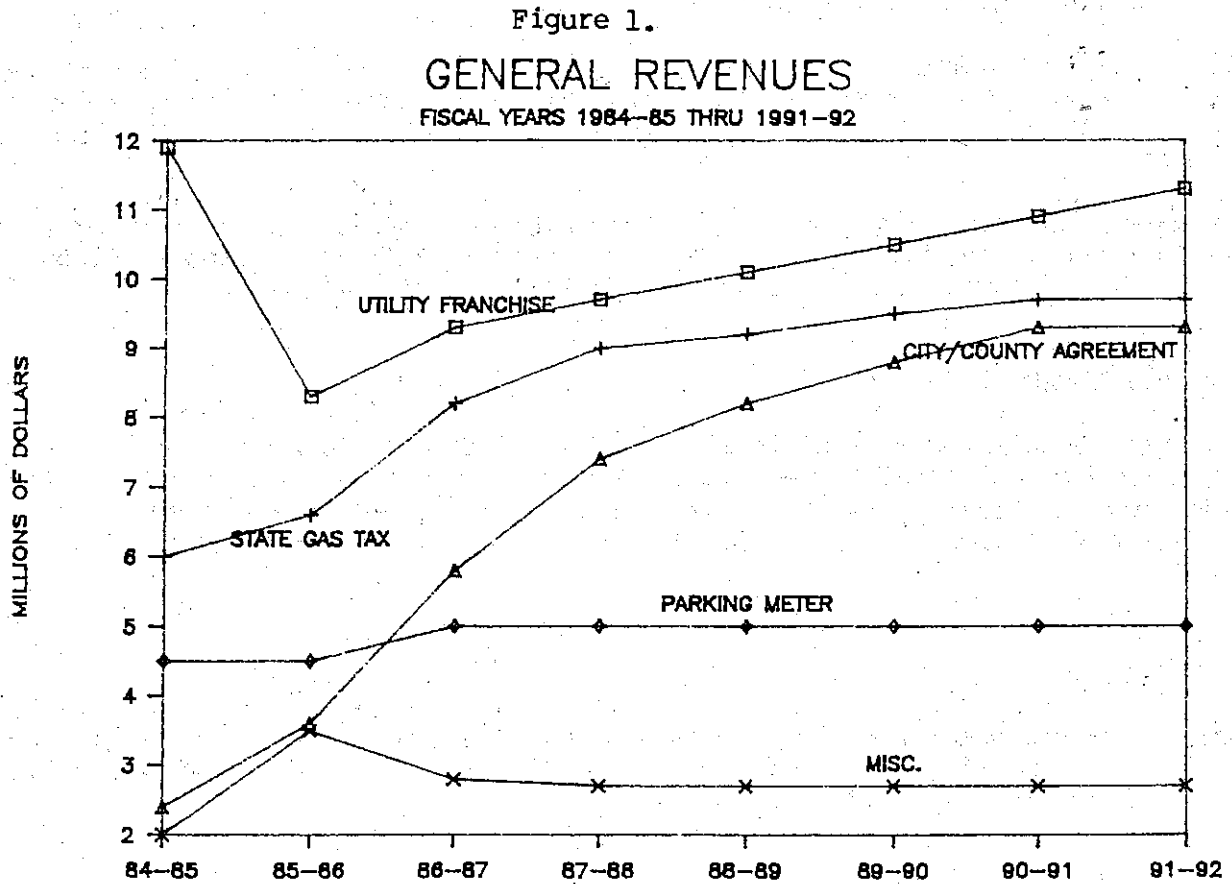
#### CONTRACTS

PDOT is reimbursed through contracts with other public entities for work performed on multi-jurisdictional transportation projects. In FY 86-87, about \$.9 million will be received.

TRANSPORTATION REVENUE FORECASTS

The following figures compare PDOT resources from FY 84-85 through FY 91-92 for major existing revenue sources.

Figure 1 illustrates anticipated general revenues.

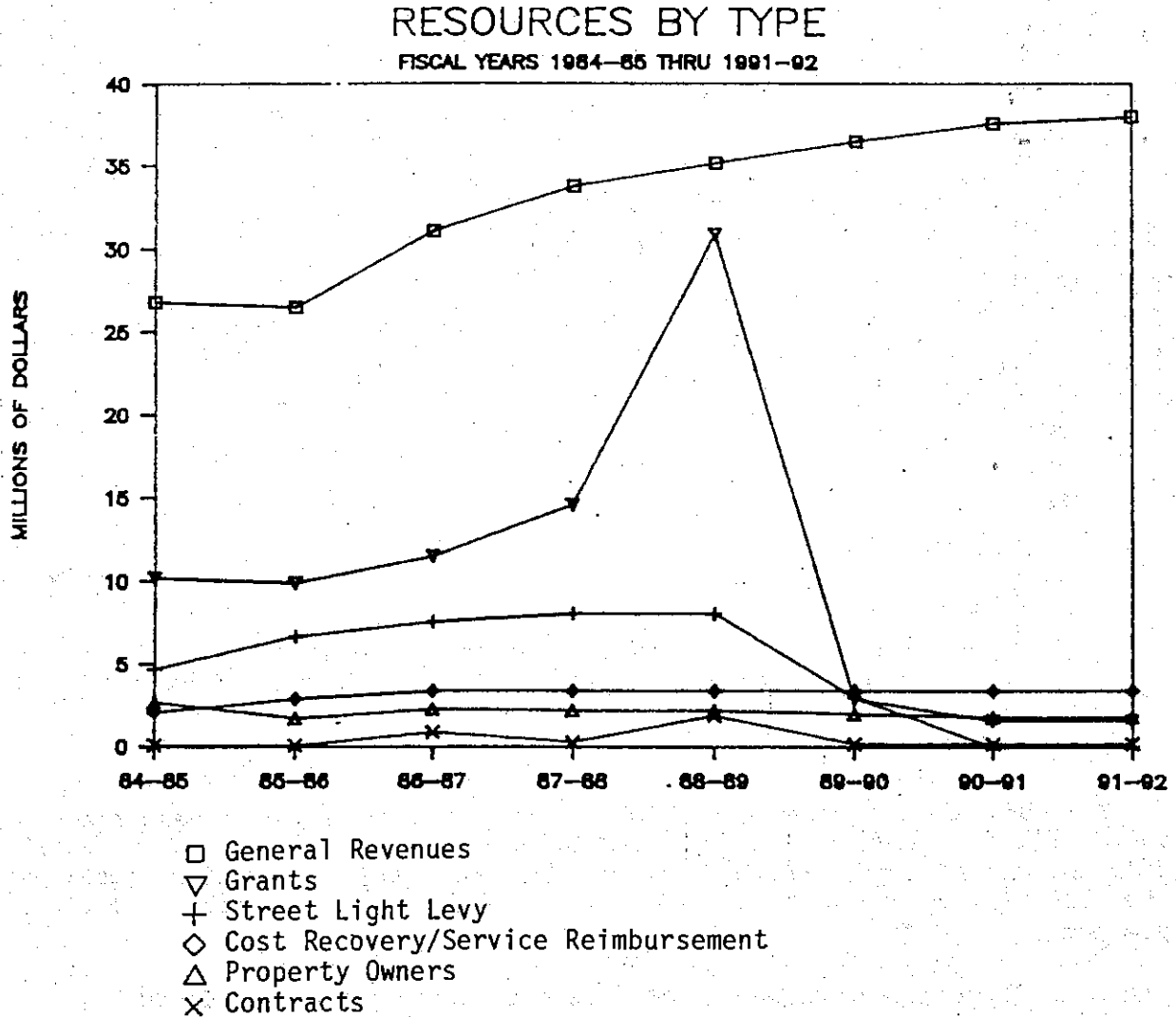


Parking meter and fine revenue are dedicated by city ordinance to transportation activities and are expected to remain the same. State highway funds are dedicated by the state to transportation services and will provide a stable source of funding. If the proposed gas tax increase is approved this revenue will increase. City/County Road Contract funds are expected to increase as annexation occurs. However, funds could decrease if annexations are ruled illegal or they could increase if the state gas tax is increased and as a result Multnomah County receives a greater percentage of state gas tax funds. Utility franchise fees are the only general fund transportation revenue. PDOT's percentage is determined annually by city council. This forecast assumes the percentage will remain the same as in FY86-87.



Figure 2 shows PDOT resources by type of resource.

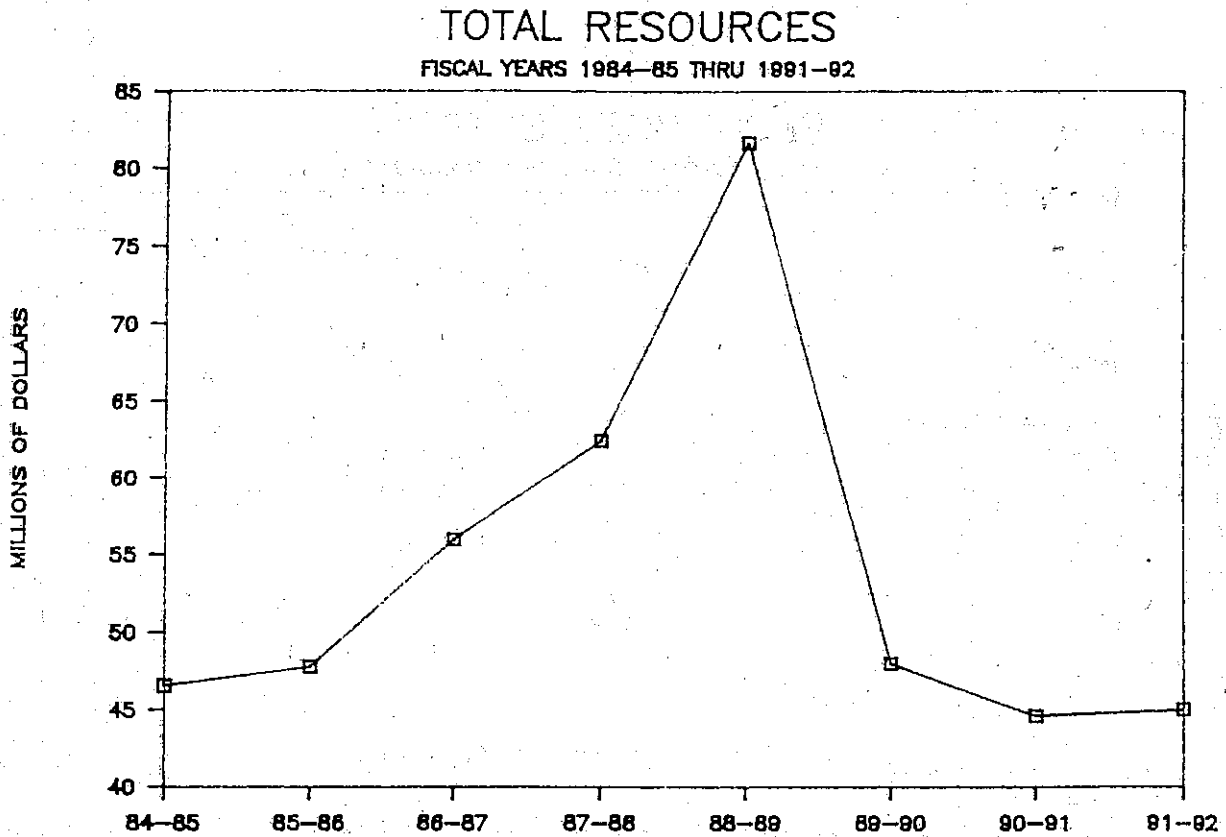
Figure 2.



In FY 89-90, federal grant funds will drop from \$30.9 million to \$2.9 million. The Street Light Levy will expire July 1, 1988, leaving \$12 million in a reserve account, which will be depleted by FY 89-90 leaving no source of funding for street lighting needs. General revenues will remain essentially at the same level, increasing a small amount due to inflation and economic growth.

Figure 3 shows total PDOT resources.

Figure 3.



In FY 84-85, all resources totaled \$46.6 million. Today, these resources are \$56.8 million. Revenues are expected to increase through FY 88-89 to \$81.7 million, decreasing by FY 91-92 to the FY 84-85 Level. The major reason for the FY88-89 increase is the FAIX program, which is used for federal capital projects.

Other transportation resources that are not administered by PDOT but contribute to the condition of the transportation system within Portland city limits may be reduced given changes in federal and state priorities. A large portion of state highway funds have been spent on the interstate system which passes through Portland. Changes in federal guidelines proposed for 1991 may result in the state spending more money on primary systems than on the interstate system, as mentioned earlier. Overall impact on Portland's system, if this were to happen, may be a decline in the condition of the interstate system within the city.

#### IV TRANSPORTATION RESOURCES AND SERVICES

The categories of Operations and Maintenance (O&M), Repair and Preservation (R&P) and Construction and Expansion (C&E) have been used to delineate PDOT's transportation services and resources. Transportation services are divided into five major service areas: Streets, which includes paved streets and sidewalks; Structures, which includes bridges and retaining walls; Traffic Signals, which includes controllers and signal wiring; Traffic Circulation, which includes traffic modifications and parking; and Street Lights. Administrative costs were distributed according to the work performed in each category: 60% O&M, 10% R&P and 30% C&E.

##### OPERATIONS AND MAINTENANCE

Routine operations and maintenance activities must be performed to protect the City's investment in its street system. These activities include street sweeping, patching potholes, maintaining street lights and traffic signals, bridge maintenance and snow and ice removal.

In FY 86-87, the City budgeted \$33.9 million for the operation and maintenance of its transportation system.

##### BUDGETED OPERATIONS AND MAINTENANCE RESOURCES AND SERVICES FY 86-87

RESOURCES			SERVICES		
General Revenues	\$23.8	69%	Streets	\$19.9	59%
Street Light Levy	6.0	18	Structures	.8	2
Service Reimb/Cost			Traffic Signals	2.4	7
Recovery	2.9	9	Traffic Circulation	4.6	14
HCD Block Grant	.2	.7	Street Lights	6.2	18
Property Owners	.9	3			
Contracts	.1	.3			
	Total \$33.9	100%		Total \$33.9	100%

The major source of revenue for operation and maintenance activities is general revenues. The major work activity is street services, including sidewalks.

An adequate maintenance service level is necessary to prevent transportation facility deterioration. An in-depth analysis of adequate maintenance levels for PDOT's transportation facilities has not been performed. However, the Oregon Road Finance Study performed a general assessment of O&M needs at the state, city and county level showing that: 1) The state is currently funding O&M at 80% of need; 2) cities are funding O&M at the 60% of need level; and 3) counties are funding O&M need at 50%. Based on this study, PDOT would need to increase its O&M budget by \$13.5 million to fund O&M at 100%.

REPAIR AND PRESERVATION

The capital investments in the City's transportation system can be further protected by repair and preservation activities that extend the life of the facilities. Repair and preservation work activities differ from capital and expansion expenditures in that they do not add to the capacity of the system. R&P activities consist of pavement resurfacing with and without minor improvements, bridge and retaining wall repair, traffic signal and street light replacement. Traffic measures that improve safety and reduce congestion that do not involve construction are also included.

In FY 1986-87, the City budgeted \$4.7 million for the Repair and Preservation of the transportation system.

BUDGETED REPAIR AND PRESERVATION RESOURCES AND SERVICES FY 86-87

RESOURCES			SERVICES		
General Revenues	\$4.5	96%	Streets	\$3.6	77%
Street Light Levy	.1	2	Street Lights	.1	2
HBR	.1	2	Structures	.7	15
			Traffic Signals	.3	6
	Total \$4.7	100%		Total \$4.7	100%

Ninety-six percent of all funds for R&P activities come from general revenue sources. Pavement overlays account for 77% of the repair and preservation work.

To efficiently manage transportation facilities, it is necessary to sustain the existing investment and level of service through maintenance and repair, thereby avoiding the much higher cost of replacement. If scheduled repair and preservation work is not performed due to lack of funds a "backlog" occurs. "Backlog" is a term used to represent the amount of identified work for which no funds are available.

Pavement

In pavement-related work the "backlog" includes resurfacing, slurry seal and reconstruction. As a city's pavement backlog grows, so does its pavement liability. The liability or cost of the system increases geometrically with time because of the relationship between the cost of repairing a road which may need only crack sealing in year one versus the cost of repairing a road a few years later which then would need an overlay or total reconstruction. National studies have shown the costs of repair to be four to five times as great when the pavement deteriorates beyond 75% of its intended life span.

An annual street surface treatment program of 89 miles per year, not accounting for growth through annexation, is required to hold the line of pavement deterioration. This is based on a 12-year average life-span of arterial pavement and a 25-year average life-span of local street pavement. In FY 86-87, the City budgeted 50 miles of pavement to receive surface treatment. Thus the 39 miles not budgeted for treatment will become a part of

the "backlog".

The miles of pavement planned for surface treatment has decreased over the last five years.

MILES OF SURFACE TREATMENT

	FY 80-81	FY 81-82	FY 82-83	FY 83-84	FY 84-85	FY 85-86	FY 86-87
Resurface	49.5	41.5	33.5	28.9	34.9	36.0	36.0
Slurry	12.8	12.8	12.8	12.8	13.8	13.8	13.8
Reconstruction (FAIX)	10.0	10.0	10.0	10.0	-	-	-
	<u>72.3</u>	<u>64.3</u>	<u>56.3</u>	<u>51.7</u>	<u>48.7</u>	<u>49.8</u>	<u>49.8</u>

The table presents the number of miles planned for surface treatment over the last six years. The Reconstruction (FAIX) category represents arterial overlay projects which were funded by FAIX. Forty miles of overlay were planned. Sixty-three miles were actually completed. Excluding FAIX miles, 303.1 miles were planned for surface treatment. The number of miles actually receiving surface treatment is not available. However, the required 89 mile per year of street surface treatment to prevent pavement deterioration was not met in any year. The cumulative backlog at the end of 1986 was 479.5 miles.

Currently, funds for street surface treatment come from General Revenues. In past years, federal funds have been used to repair and preserve pavement as shown in the FAIX category above.

#### Structures

The effect of postponing repair and preservation work on bridge and retaining walls has not been documented to the same extent as street pavement. However, future liability can be reduced if structures are repaired before the cost of preservation exceeds replacement costs.

A capital evaluation project of structures has recently been completed for PDOT. A rating system was developed based on structure condition and the functional level of service. Using this system, the current and projected condition of each structure was determined.

Based on this rating system, repair and preservation projects can be separated from construction and expansion projects. Of the \$11 million capital improvement program identified, \$5.6 million are R&P projects. The system currently does not include adequate data to perform life cycle cost analysis. As information is accumulated the most cost effective combination of improvements and maintenance can be determined by life cycle analysis.

#### Traffic signals and street lights

Replacement schedules for traffic signals and street lights are based on

designated life-spans. If replacement does not occur on schedule, operation and maintenance costs increase dramatically. Traffic signals need to be replaced at the rate of 40 per year to avoid higher operation and maintenance costs. The current replacement rate is 18 per year, which will drop to 10 per year within two years given available funds. Street lighting is financed through a voter-approved street lighting levy. Street light luminaires are replaced according to an optimum replacement schedule since the revenue fund is dedicated to street lighting and funding levels can be predicted.

Traffic modifications that increase safety and improve traffic flow for which no construction is required qualify as R&P work activities. As a part of the 1987 Transportation Status and Condition Report, twenty-two of the forty critical major intersections were identified within the R&P category. Modifications include signing, striping, turn prohibitions and changes in signal phases. The remaining eighteen critical major intersections require C&E modifications.

#### CONSTRUCTION AND EXPANSION

Construction and Expansion activities are improvements to the system either through new construction or through expansion of existing facilities to increase capacity.

In 1986-87, Portland budgeted \$18.2 million on new construction activity.

#### BUDGETED CONSTRUCTION AND EXPANSION RESOURCES AND SERVICES FY86-87

RESOURCES			SERVICES		
General Revenues	\$2.8	15%	Streets	\$16.1	88%
Street Light Levy	1.5	8	Traffic Signals	.5	3
HBR	.4	2	Traffic Circulation	.2	1
FAIX	6.1	34	Street Lights	1.4	8
UMTA	2.2	12			
HCD Block Grant	1.7	9			
FAU	.4	2			
Title II	.4	2			
Property Owners	1.4	8			
Cost Recovery	.5	3			
Contracts	.8	5			
Total \$18.2 100%			Total \$18.2 100%		

Federal funds represent \$11.2 million or 62% of the funds available for capital projects. As federal funds are reduced, very little money will be left for construction and expansion activities. Street capital projects account for 88% of the services. No money was budgeted for bridge and retaining wall construction and expansion.

Since 1978, the City has relied largely on federal dollars for transportation construction and expansion activities. Federal funds were received from a variety of programs: FAIX, FAU, HCD, Economic Development Administration (EDA)

and the Jobs Bill. By the year 1990, the end of identified federal funds, \$135.1 million will have been spent on transportation capital improvements. Maintenance and Repair and Preservation activities account for 15% of the funds. Capital improvements account for 85%.

Of these funds, the Federal Interstate Transfer Withdrawal (FAIX) program has provided flexible funding for transportation projects. For example, the redevelopment of the Hollywood District, Powell Boulevard reconstruction, the construction of the Banfield Highway, and the construction of the Banfield light rail line were all financed with FAIX funds. These funds are not tied to site-specific projects, instead, the City Council and Metro Region were able to rank order transportation projects throughout the city and region. In contrast, most remaining sources of capital funding are site-specific.

It is difficult to predict future construction and expansion costs associated with growth. In some cases, growth means construction of new houses which require new local roads. This cost is generally borne by the adjacent property owners or developers. Although local improvement districts may be formed with the city's assistance, the cost is paid by the local property owner, not the city. New growth in local roads, however, can mean increased traffic on collectors and arterials. The city is responsible for expansion costs for these streets. Increasing capacity to maintain a certain level of service has been a cost which the city has incurred, when funding was available.

In other cases, new growth means new business development, such as the Columbia South Shore area, or redevelopment activity, such as the Central East Side, or the proposed Convention Center. All of these developments require changes in the transportation system. Development and transportation form a natural relationship trading lead roles depending on the degree of development which has already occurred. New development cannot happen unless transportation first provides access to land. Redevelopment frequently leads the way to increased or altered transportation requirements.

New growth and a dynamic economic redevelopment environment are important to the city's health. Flexible capital funds are necessary to meet the demands placed on the transportation infrastructure.

## V. PROJECTED SYSTEM NEEDS

In 1985, PDOT initiated a needs assessment process to identify current and projected needs of Portland's transportation capital facilities. The analysis assessed work activities necessary to preserve the city's capital investment in its transportation facilities. It did not include operations and maintenance (O&M) work activities. The analysis assumed that routine maintenance, street sweeping, bridge painting, and routine traffic signal maintenance would continue to occur at present levels. If routine maintenance is decreased then repair and preservation needs will increase. New construction needs were not included.

The first step in this process was to identify the current condition of transportation facilities. Performance measures were selected within each capital inventory to assess the condition and use of the inventory. Current condition was determined for pavement, bridges, retaining walls, traffic signals, street lights and for safety and congestion of major intersections. The current level of funding for repair and preservation was calculated for each inventory.

In January 1987, the current condition and funding assessment was completed for all inventories except drainage facilities, curbs and sidewalks. The city's investment value in transportation facilities is over \$1.5 billion. On the average, sixty percent of these facilities are in good or better condition. The reverse of this is that forty percent of transportation facilities need repair, preservation, replacement or reconstruction work. The unmet repair and preservation need for transportation facilities total \$50.9 million. Table 1 from Portland's Transportation System: Status and Condition Report, January 1987, summarizes the status, replacement value, condition, and unmet need of Portland's transportation system.

The relatively good condition of Portland's transportation system is in large part due to the age of the system and prudent use of federal financing. Between 1978 and 1990, over \$135 million will be spent on the transportation system. Eighty-five percent of this amount is for construction and fifteen percent for repair and preservation work.



Table 1

## PORTLAND TRANSPORTATION SYSTEM STATUS, CONDITION, AND VALUE

January 1987

FACILITY	STATUS	REPLACEMENT VALUE	CONDITION - Percent						UNMET NEED
			VG	G	F	P	VP	N/A	
<b>PAVEMENT</b>									
Improved Streets	3,245 lane miles	\$ 1,250,789,200	24%	37%	24%	12%	3%		43,634,500
Unimproved Streets	122 lane miles	38,812,000					100%		
<b>STRUCTURES</b>									
Bridges	109	79,550,104	40%	28%	18%	10%	4%		740,000
Retaining Walls	167	12,872,775	88%	10%	2%	0%	0%		
Guardrails	15 miles	4,275,637						X	
Stairways	168	2,633,700						X	
Harbor Wall	5,400 feet	55,211,750						X	
		154,343,166							740,000
<b>TRAFFIC SIGNALS</b>									
Hardware	872	39,240,000		69%	20%	11%			4,140,000
Controllers	872	5,073,000		66%	11%	23%			1,222,000
Other Signal Equipment	96	500,000						X	
		44,813,000							5,362,000
<b>TRAFFIC SAFETY</b>									
Major Intersections	1,228	Not Applicable		82%	15%	3%			1,133,200
<b>STREET LIGHTS</b>	39,000	7,015,500		77%	21%	2%			0
<b>STREET SIGNS</b>									
Street Name	39,885	678,045						X	
Parking	35,800	1,005,980						X	
Traffic Control	21,900	843,150						X	
	97,595	2,527,175							N/A
<b>PARKING METERS</b>	6,269	2,373,950						X	N/A
<b>FACILITIES SUBTOTAL</b>		1,500,673,991							50,869,700
<b>RIGHT-OF-WAY</b>	1,660 miles	\$ 2,149,909,344							0
<b>TOTAL</b>		\$ 3,650,583,335							50,869,700

\* City investment has not been made on unimproved streets. The value given denotes the cost to improve the streets, including drainage improvements.

CODES	VG=Very Good	G=Good	F=Fair	P=Poor	VP=Very Poor	N/A=Info Not Available
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Source: City of Portland, Bureaus of Maintenance, Transportation Engineering, Transportation Planning & Finance, Traffic Management, 7/86.

Rating systems exist for each major inventory. In 1983 a Pavement Management System (PMS) was put into operation. It identifies condition and assigns a maintenance strategy for each street within the city. The percentage of streets in good or better condition decreased from 68% in 1985 to 61% in 1986. This decrease is attributed to an increase in miles due to annexation and an increase in the number of miles needing surface treatment for which no funds were available. To bring the streets in poor and very poor condition up to good or better condition would require \$43.6 million. All of these projects are R&P work activities.

In 1986, PDOT completed an evaluation of its bridges and retaining walls which included the development of an inventory rating system. The system was used to assess the condition of the city's bridges and retaining walls.

Sixty-eight percent of bridges are in good or better condition. The existing funding level is not sufficient to maintain bridges in current condition. A ten year Capital Improvement Program was developed to preserve the city's bridges in current condition. An \$11 million investment is necessary to maintain current bridge condition over the next ten years. To bring the poor and very poor bridges in critical condition to good or better condition would require \$740,000.

Retaining wall condition was assessed for all retaining walls except the Harbor Wall. The Harbor wall represents 36% of the total \$154 million invested in the structures inventory. Ninety-eight percent of the inventory is in good or better condition. It is expected that this condition can be maintained given current levels of maintenance. However, over-all structure liability cannot be determined until the condition of the Harbor Wall is evaluated.

Traffic signal condition has been calculated for the two major components of signals: intersection hardware and signal controllers. Replacement occurs on a 25-year replacement cycle for hardware and a 15-year replacement cycle for controllers. Sixty-nine percent of intersection hardware and sixty-six percent of signal controllers are in good condition. It would take \$4.1 million to bring all of intersection hardware currently exceeding useful life into good condition. It would cost \$1.2 million to bring signal controllers exceeding useful life into good condition.

Street lights differ from other transportation facilities in that a separate levy provides financing for the system. By the end of 1987-88, 97% of the street lights will be in good condition. There are no unmet needs within this category. However, between 2010 and 2017 all luminaires converted to energy-efficient lights will reach their 30 year life-span and will need to be replaced.

Within the city there are forty major intersections that are rated as critical with regard to safety and congestion. It would cost \$1.2 million to improve all forty intersections using an average cost of improvement per intersection of \$28,330.

Current identified unmet needs for repair and preservation within transportation facilities total \$50.9 million. If unmet needs were met all of transportation facilities would be in fair or better condition. No facilities would be in poor condition.

This analysis of projected system needs does not include operations and maintenance and construction and expansion needs. If maintenance work activities are decreased then repair and preservation needs will increase. If repair and preservation is deferred then construction and expansion needs will increase.

## VI. RESOURCES COMPARED WITH IDENTIFIED NEED

Several steps were taken to compare PDOT's resources with projected and identified needs. The first step was to devise a mathematical model to forecast requirements for the next five years not taking into consideration unmet need. The second through fourth steps addressed unmet needs.

First, assumptions of the mathematical model were determined: 1) an inflation rate of 4% per year with FY 86-87 as the base value was used; 2) annexation increments were based on the City/County Road Contract adjusted forecasts; 3) administrative overhead was distributed 60% to O&M, 30% to R&P and 10% to C&E; 4) 120% of FAIX grant resources for FY 87-88 and FY 88-89 was used to account for required match; and, 5) a \$6 million FAIX program beyond FY 90-91 was assumed.

Second, the shortfall for FY84-85 and FY85-86 was calculated based on unmet pavement needs. Unmet needs for structures, traffic signals, street lights and traffic safety are not available for these years, making unmet needs for these years low.

Third, the FY86-87 shortfall was based on transportation facility unmet needs for pavement, structures, traffic signals, street lights and traffic safety modifications.

Fourth, the shortfall for future years was based on: 1) pavement unmet needs continuing at historic levels, an average of 45 miles per year; 2) a ten-year Capital Improvement Program for structures; 3) the life-spans of traffic signals and street lights.

The analysis of revenue was based on: 1) no new sources of revenue; 2) the depletion of the Street Lighting Levy reserve in 1991; 3) an inflation rate of 4% for Utility Franchise Fees; and, withholding one million of the State Highway Trust Fund in the reserve account each fiscal year.

The following table shows a three-year history and a five-year forecast of PDOT's annual requirements and resources.

TRANSPORTATION RESOURCES AND REQUIREMENTS  
FY84-85 THROUGH FY91-92

(in millions of current dollars)

	ACTUAL		BUDGET	FORECAST				
	FY84-85	FY85-86	FY86-87	FY87-88	FY88-89	FY89-90	FY90-91	FY91-92
Resources	\$46.6	\$47.8	\$56.8	\$62.4	\$81.7	\$48.0	\$44.6	\$45.0
FY86-87 SERVICE LEVEL								
Requirements								
O & M	23.2	27.5	33.9	35.4	37.3	39.2	41.1	42.8
R & P	4.0	3.4	4.7	5.1	5.4	5.7	5.0	5.3
C & E	19.4	16.9	18.2	22.8	43.0	21.0	22.0	22.9
Total Requirements	\$46.6	\$47.8	\$56.8	\$63.3	\$85.7	\$65.9	\$68.1	\$71.0
Difference (Resources less Total Requirements)	\$0.0	\$0.0	\$0.0	(\$0.9)	(\$4.0)	(\$17.9)	(\$23.5)	(\$26.0)
FY86-87 SERVICE LEVEL - O & M AND C & E NEEDED R & P SERVICE LEVEL								
Requirements								
O & M	23.2	27.5	33.9	35.4	37.3	39.2	41.1	42.8
R & P	4.0	3.4	4.7	5.1	5.4	5.7	5.0	5.3
Unmet R & P *	35.8	2.2	12.9	5.0	5.9	6.1	5.7	7.0
C & E	19.4	16.9	18.2	22.8	43.0	21.0	22.0	22.9
Total Requirements	\$82.4	\$50.0	\$69.7	\$68.3	\$91.6	\$72.0	\$73.8	\$78.0
Difference (Resources less Total Requirements)	(\$35.8)	(\$2.2)	(\$12.9)	(\$5.9)	(\$9.9)	(\$24.0)	(\$29.2)	(\$33.0)
CUMULATIVE TOTAL DIFFERENCE	(\$35.8)	(\$38.0)	(\$50.9)	(\$56.8)	(\$66.7)	(\$90.7)	(\$119.9)	(\$152.9)

The table of Transportation Resources and Requirements shows that existing resources will be inadequate to support the current service level by FY87-88. A shortfall of \$.9 million in FY87-88 will increase to \$26 million annually by FY91-92 in the absence of new revenue. If R&P unmet needs are included, as shown in the second set of requirements, the annual shortfall would increase by \$5-7 million annually. By FY91-92, the total cumulative shortfall would grow to nearly \$153 million. This figure is conservative in that it excludes the unfunded needs pertaining to operation and maintenance, and construction and expansion.

The table also shows an unmet need in prior years. The FY84-85 and FY85-86 cumulative figures of \$35.8 million and \$38.0 million, respectively, are for the pavement portion of unmet repair and preservation needs. Beginning in FY86-87, the \$50.9 cumulative shortfall represents the unmet repair and preservation need for all transportation facilities.

## VII. NEW OR INCREASED RESOURCE OPTIONS

New or increased resource options need to be identified and pursued in order for the city to continue to fund necessary transportation services at the existing level of service. As a part of this effort, PDOT requested Government Finance Associates, Inc. (GFA) to review potential transportation financing options that may be available to PDOT. Options were divided into three categories: revenue options, institutional options, and debt financing options. Criteria were established to evaluate the options according to legality, revenue adequacy, equity, public acceptance and ease of administration to determine which financing options best meet the short and long-term needs of PDOT. Options were reviewed for their ability to fund operating or capital work activities.

Numeric values of 1, 3, or 5 were assigned to each criterion. A higher numeric value indicates a higher level of acceptability. For each criterion key factors were assigned as follows: legality was determined by the presence or absence of the city's authority to implement an option; revenue adequacy was based on the revenue generating capacity and the stability of the revenue stream; equity was measured by the relation between what it costs to provide a transportation service and what the user is charged; public acceptance was based on PDOT's or other communities' historical experience; and, ease of administration was assessed based on staff time and city resources necessary to implement an option.

Combined evaluation scores equal to or greater than 17 indicate that an option should be pursued. A score of 15 indicates that an option should be considered as part of a long-term funding strategy.

The following table lists revenue options evaluated by GFA.

Those items with scores equal to or greater than 17 representing existing revenue sources that should be pursued are: serial levy, state highway funds, federal funds, state and county gas tax, right-of-way related charges, parking/storage charges, and drainage fees.

TABLE 2  
 City of Portland  
 Office of Transportation  
 Evaluation of Transportation Revenue Options

ITEM	LEGALITY	EVALUATION CRITERIA						USES OF FUNDS	
		REVENUE ADEQUACY	EQUITY	PUBLIC ACCEPTANCE	EASE OF ADMIN.	TOTAL	OPERATING	CAPITAL	
<b>Broad Based Taxes</b>									
Income Tax	1	5	1	1	5	13	X	X	
Property Tax	3	5	1	1	5	15	X	X	
Tax Base	3	5	1	3	5	17	X	X	
Serial Levy	1	5	1	1	1	9	X	X	
Local Sales Tax	1	3	1	3	1	9	X	X	
Real Estate Transfer Tax	1	3	1	3	1	9	X	X	
<b>Public/Private Financing</b>									
Systems Development Charges	3	3	5	3	3	17	X	X	
Construction Tax	1	3	5	3	3	15	X	X	
Developer Tax	1	3	5	3	3	15	X	X	
Traffic Impact Fees	3	3	5	3	3	17	X	X	
Development Growth Management	3	3	5	3	1	15	X	X	
Development Rights Swap	3	3	5	3	1	15	X	X	
<b>Grants/Revenue Sharing</b>									
Lottery Funds	5	1	3	5	5	19	X	X	
State Highway Funds	5	3	3	5	5	21	X	X	
State Energy Funds	5	1	3	5	5	19	X	X	
Federal Funds	5	3	3	5	5	21	X	X	
<b>Fuel User Charges</b>									
State Gas Tax	3	5	5	3	5	21	X	X	
Regional Gas Tax	1	3	5	1	3	13	X	X	
County Gas Tax	3	5	5	3	5	21	X	X	
City Gas Tax	1	3	5	3	5	17	X	X	
<b>Transportation Excise Taxes</b>									
Auto Sales Tax	1	3	3	1	1	9	X	X	
Special Excise Taxes	1	3	5	1	1	11	X	X	
<b>Vehicle User Charges</b>									
Weight/Mile Tax	1	3	5	1	1	11	X	X	
Auto Registration Fees	1	3	5	3	3	15	X	X	
<b>Right-of-Way Related Charges</b>									
Utility Franchise Fees	5	3	3	3	5	19	X	X	
Street Permit Fees	5	1	5	3	5	19	X	X	
Subsurface Leasing	3	1	5	3	3	15	X	X	
Air Rights Leasing	3	1	5	3	3	15	X	X	
<b>Parking/Storage Charges</b>									
	3	3	3	3	5	17	X	X	

TABLE 2 (Continued)  
 City of Portland  
 Office of Transportation  
 Evaluation of Transportation Revenue Options

ITEM	EVALUATION CRITERIA							TOTAL	USES OF FUNDS	
	LEGALITY	REVENUE ADEQUACY	EQUITY	PUBLIC ACCEPTANCE	EASE OF ADMIN.		OPERATING		CAPITAL	
User Fees										
Street Lighting	3	5	5	3	1	17	X	X		
Street Cleaning	3	5	5	3	1	17	X	X		
Street Maintenance	3	5	5	3	1	17	X	X		
Drainage	5	5	5	3	5	23	X	X		
Tax Increment Financing										
Property Tax Increment	5	5	3	3	3	19	X	X		
Income Tax Increment	1	5	3	3	3	15	X	X		
Transportation Access Charges										
Tolls	1	3	5	1	1	11	X	X		
Automatic Toll Collection	1	3	5	1	1	11	X	X		
Extraction Taxes	1	1	1	5	1	9	X	X		

LEGEND:  
 1-Low  
 3-Medium  
 5-High



New revenue options that should be pursued are: public/private financing, lottery funds, state energy funds, city gas tax, user fees, and property tax increment financing.

Existing revenue sources were described in Chapter III of this report. The following descriptions are of new revenue options:

Public/private financing is a method where the private sector is required to pay for a part or all of public facility improvements. The demand for these improvements is generated by new development. The arguments for implementing fees and charges are based on the need to expand capacity to meet the transportation needs of the development. Development growth management policies should be developed first before system development charges, construction taxes, developer taxes or traffic impact fees are established.

State lottery funds are available for projects that are linked to economic development. The city must apply on a per project basis for funds.

State energy funds are available for projects that reduce energy consumption. Major transportation categories are traffic signal and street light energy reduction and transportation management which includes alternative transportation and parking management.

User fees are charges that recover the costs of transportation services. Portland currently includes a drainage fee as a part of the sewer bill. Street lighting, street cleaning and street maintenance user fees are being considered by Portland as part of the Street User Fee Study.

Property tax increment financing is a revenue option that is used to fund projects that are part of an urban renewal district. According to GFA, this revenue option relies on increases of a dedicated revenue stream within the urban renewal district to pay off bonded debt sold to finance the underlying public improvements. As private investment occurs within the district, annual revenues increase and provide the basis for debt repayment. The revenue stream currently allowed by state law is the property tax.

The State Modernization Program was not reviewed by GFA but is a potential source of funds. Two hundred million dollars has been set aside from the 1985 gas tax increase for improvements to the State Highway System. Funds are distributed according to a six-year plan process established by the Oregon Department of Transportation.

GFA's table shows that all revenue sources can be used for construction and expansion projects. The only funds that are not available for operating uses are public/private financing, grants/revenue sharing and tax increment financing. The only resource restricted to operations and maintenance work activities is the street cleaning user fee.

The GFA report did not include an analysis of the use of funds for repair and preservation work. The recognition of the importance at the national, state and city level of repairing and preserving an already constructed, aging system suggests a new look at funding options for this type of work.

The following table shows that funding sources for operations and maintenance and construction and expansion can be used for repair and preservation except for a street cleaning user fee, specific grants and tax increment financing.

FUNDING SOURCE BY WORK TYPE

O&M	R&P	C&E
Fuel User Charges State Gas Tax County Gas Tax City Gas Tax	Fuel User Charges State Gas Tax County Gas Tax City Gas Tax	Fuel User Charges State Gas Tax County Gas Tax City Gas Tax
Vehicle User Charges State Weight/Mile Tax Auto Registration Fee State Titling Fee	Vehicle User Charges State/Weight Mile Tax Auto Registration Fee State Titling Fee	Vehicle User Charges State/Weight Mile Tax Auto Registration Fee State Titling Fee
Right-Of-Way Charges Utility Franchise Fees	Right-Of-Way Charges Utility Franchise Fees	Right-Of-Way Charges Utility Franchise Fees
User Fees Drainage Street Lighting Street Cleaning Street Maintenance	User Fees Drainage Street Lighting Street Maintenance	User Fees Drainage Street Lighting Street Maintenance
Broad-Based Taxes Serial Levy	Broad-Based Taxes Serial Levy	Broad-Based Taxes Serial Levy
Parking Charges	Parking Charges	Parking Charges
	Grants/Revenue Sharing HBR State Energy Funds	Grants/Revenue Sharing State Lottery Federal Funds FAU HCD
	Public/Private Financing Systems Development Charge	Public/Private Financing Systems Development Charge
		Tax Increment Financing

Public/Private Financing options may be a source for repair and preservation work activities. An argument can be made that new development or redevelopment generates additional traffic that results in a faster rate of deterioration of the existing street system. If this argument can be documented, then public/private financing options might be extended to new development that dictates repair and preservation work as well as new capital projects.

Grants and revenue sharing funds have been used for construction and expansion and repair and preservation work. The city expended 85% of all federal funds on construction and expansion and 15% on maintenance and restoration. New grant funds could be pursued for repair and preservation work.

## VIII TRANSPORTATION FUNDING STRATEGY

The City of Portland's transportation goal is to provide a safe, efficient and balanced transportation system that supports economic development, sustains existing businesses and enhances neighborhood liveability. The system balances safety, neighborhood needs, mobility, and the transporting of goods. The city's transportation system is a part of a regional and state transportation system. It is highly dependent on transit. It has as one of its basic premises the conservation of energy as set forth in goal six of the City's Comprehensive Plan.

A funding strategy sets forth policies and priorities. It is the basis of an action plan for developing and expending funds. PDOT's systematic identification of system requirements and resources lays the foundation for a funding strategy. Identified requirements must be combined with city goals and policies to establish transportation's priorities for operations and maintenance, repair and preservation and construction and expansion. Once priorities are set, resource options can be developed.

The review of historic expenditures is a review of past priorities for expenditure of funds. To a large degree past work activities were based on the availability of funds. This resulted in providing basic operations and maintenance services and constructing new capital facilities. Repair and preservation of transportation facilities was deferred.

The analysis of past expenditures shows that Portland's transportation priorities have been to serve increased travel demand and to provide a safe, energy efficient transportation system that supports economic development activities.

The city's goal to provide a balanced transportation system must be expanded to include the provision of the most cost effective management of transportation facilities. This report's analysis indicates a current need to repair transportation facilities in poor condition. It will require a commitment to continue to improve productivity. Transportation resources must be managed so that an increase in travel demand is met by transit, rideshare and other transportation alternatives in addition to constructing new capital facilities. These alternatives and increased capital construction should all contribute to the support of economic development.

The City of Portland has a number of different transportation operating plans and policies that guide transportation services. The Downtown Parking and Circulation Policy adopted in 1975 and updated in 1980 and 1986 by the City Council was developed to manage the downtown transportation system in support of the goals of the 1972 Downtown Plan. The Arterial Streets Classification Policy (ASCP) adopted in 1977 and updated in 1983 guides the future development of Portland's transportation street system. The ASCP was incorporated into the Comprehensive Plan in 1980 and updated in 1984. The Regional Transportation Plan adopted by the Metropolitan Service District and updated annually sets the general direction for the region. This plan provides the population and employment forecasts that are used for regional transportation decision making. These forecasts and the plan itself are adopted by City Council resolution.

The Public Facilities Plan, Document 11 of the Comprehensive Plan, places in priority order the expenditure of funds on public facilities and services: 1) maintenance of existing facilities and service levels; 2) upgrading and improvement of existing facilities and services; and 3) expansion of existing systems, and new facilities and services.

The city's Debt Management Policy, Item 12, Maintenance, Replacement and Renewal, states that "...the City should set aside sufficient current revenues to finance on-going maintenance needs and to provide reserves for periodic replacement and renewal."

One of the objectives of the capital budgeting process for FY 86-87 is "to insure the existing infrastructure is systematically and adequately maintained".

Based on these existing city-adopted plans and policies and on an assessment of needs, the following transportation funding priorities are recommended: the first priority is to provide funding for the maintenance and operation of the existing transportation system; the second priority is to provide funding for the repair and preservation of existing transportation facilities; and the third priority is to provide funding for the construction and expansion of capital transportation facilities.

The establishment of these transportation priorities provides the basis of a transportation funding strategy. The identification of transportation facility unmet needs through the annual Status and Condition report represents the next step in formulating a strategy. To complete the funding strategy, an analysis of operation and maintenance procedures must be conducted to determine O&M needs and an analysis of construction and expansion needs must be performed to determine C&E needs. In addition, a number of policy decisions need to be addressed: the role of the public and private sector in transportation facilities and services should be defined; the responsibility of the system user to pay for transportation services needs to be determined; and, the role of the federal and state government in providing assistance to local government must also be determined.

While the above analyses and determinations are taking place, new resources

will be explored to provide a predictable source of funds to provide transportation services at existing service levels. If new sources of funding are not developed service levels will be reduced. The actual programs reduced will be a policy decision. The need to make reductions in some or all areas is inevitable unless new funds are secured.

## IX. TRANSPORTATION FUNDING STRATEGY IMPLEMENTATION

The synthesis of the recent studies on transportation funding sources and service needs shows that: predictable sources of funding dedicated to transportation services are needed; resources are inadequate to fund transportation services at the current service level; productivity improvements will continue to reduce costs, however, they cannot be expected to meet the entire resource shortfall; resources are not available to meet the identified backlog of repair and preservation of transportation facilities; federal funds that have provided the city with resources to respond to new growth and development are scheduled to end in 1990; and, revenue is needed to fund new capital projects to maintain a dynamic economic environment.

This acknowledgement of the need for a predictable source of revenue and sufficient funds to provide at least the current level of service, led to the GFA analysis of new or increased revenue options. The evaluation of options by their legality, revenue adequacy, equity, public acceptance and ease of administration provided a method for selecting resource options.

The next step in the process is to determine which of the identified revenue options should be pursued. This decision is a policy decision and requires policy discussions on the impact of each revenue source on the city and different segments of the population. For example, before a System Development Charge is pursued the effect of this charge on the development community needs to be addressed.

Revenue option selection should also take into consideration current efforts to evaluate and implement resource options. For example, The Road Finance Study's recommendations for an increase in the state gas tax, state weight/mile tax, vehicle registration fees and a new state titling fee will be considered by the 1987 state legislature. Street user fees are being reviewed at the staff level. A study of system development charges is underway.

Recommended resource options are listed below. Projected revenue is on an annual basis. The priority for implementation needs to be established based on the GFA analysis, staff analyses, and policy discussions.

RECOMMENDED RESOURCE OPTIONS

FUEL USER CHARGES

State Gas Tax  
State Weight/Mile Tax

Task: Monitor bills at legislature.  
Bureau: TP&F  
Required approval: State legislature.  
Time: 1987 legislative session.  
Projected revenue: \$1.1 million for each one cent equivalent increase.

County Gas Tax

Task: Develop proposal for increasing county gas tax.  
Bureau: TP&F  
Required approval: City Council, County Commission.  
Time: 1988 budget.  
Projected revenue: Amount would depend on increase and adjustments to the City-County agreement.

City Gas Tax

Task: Develop a proposal for a city gas tax in conjunction with county gas tax proposal.  
Bureau: TP&F  
Required approval: City Council, voter approval.  
Time: ?  
Projected revenue: \$1-5 million

VEHICLE USER CHARGES

Vehicle Registration Fee  
State Titling Fee

Task: Monitor bills at state legislature.  
Bureau: TP&F  
Required approval: State legislature.  
Time: 1987 state legislative session.  
Projected revenue: 10% annual increase in registration fee raises \$22 million statewide with 20% share for cities with 27% of this share allocated to Portland, for an annual revenue of \$1.1 million. A 2% titling fee will raise \$92 million statewide with an allocation of 20% to cities with 27% to Portland, for an annual revenue of \$4.9 million.



## RIGHT-OF-WAY RELATED CHARGES

### Utility Franchise Fee

Task: Develop proposal to determine a predictable percentage for PDOT.  
Bureaus: TP&F, Bureau of Maintenance (BOM), Bureau of Transportation Engineering (BTE).  
Required Approval: City Council  
Time: FY88-89 budget.  
Projected revenue: ?

## USER FEES

### Drainage

Task: Increase drainage fee and dedicate percentage of increase to PDOT to implement drainage master plan.  
Bureaus: TP&F, BOM, BTE, Bureau of Environmental Services (BES)  
Required Approval: City Council.  
Time: FY 88-89.  
Projected revenue: ?

- Street Lighting
- Street Cleaning
- Street Maintenance
- Street Operations

Task: Complete Street User Fee study.  
Bureaus: TP&F.  
Required Approval: City Council, Voter.  
Time: FY 88-89.  
Projected revenue: Revenue is based on cost recovery.  
Street lighting user fee, if implemented, would replace serial levy and provide \$6.5 million annually. Street cleaning, maintenance and operations would provide annual revenues up to \$26 million.

## BROAD-BASED TAXES

### Serial Levy

Task: Develop proposal for three-year street lighting levy, if street lighting user fee is not pursued.  
Bureau: Bureau Transportation Management (BTM)  
Required Approval: City Council, voter.  
Time: May, 1988 election.  
Projected revenue: \$6.5 million annually.

## PARKING CHARGES

Task: Include in the parking management program a policy on revenue. Develop a proposal for increased revenues based on policy.

Bureau: BTM & TP&F.

Required approval: City Council

Time: 1987

Projected revenue: \$1-5 million

## PUBLIC/PRIVATE FINANCING

### Growth Management Policies

Task: Develop Growth Management Policies which take into account the policies of other jurisdictions. Develop review process for citizen and developer review.

Bureaus: TP&F and Bureau of Planning (BOP).

Required approval: Planning Commission, City Council.

Time: 1987

Projected revenue: Policies are the basis of System Development Charges.

### System Development Charges

Task: Institute SDC's for capital and possibly repair and preservation work categories. Base charges on Growth Management Policies.

Bureaus: BTE & TP&F

Required Approval: City Council

Time: 1987-88

Projected revenue: \$1-5 million.

## TAX INCREMENT FINANCING

Task: Select specific geographic areas that qualify for Urban Renewal status.

Bureaus: BTE, TP&F & Portland Development Commission (PDC)

Required approval: City Council

Time: 1987 on-going

Projected revenue: Exceeding \$5 million.

## GRANTS/REVENUE SHARING

### Federal Aid to Urban Systems (FAU)

Task: Develop proposals for continued federal funding of urban area transportation needs.

Bureau: TP&F

Required approval: Federal

Time: 1987 on-going (1990 reauthorization)

Projected revenue: Dependent on project eligibility and level of funding.

### New Federal Funds

Task: Develop proposals for new federal funds. Monitor the development of any new federal funds.

Bureau: TP&F

Required approval: Federal

Time: 1987 on-going

Projected revenue: ?

### Housing and Community Development Block Grant (HCD)

Task: Work with the Bureau of Community Development on defining eligible transportation programs in HCD areas.

Bureau: BTE

Required approval: City Council

Time: 1987 on-going

Projected revenue: Dependent on project eligibility.

### Highway Bridge Replacement (HBR)

Task: Based on Structures Capital Evaluation, select bridges that qualify for HBR funding.

Bureau: BTE

Required approval: Oregon Department of Transportation

Time: 1987 and on-going.

Projected revenue: Dependent on project eligibility.

### State Modernization Program

Task: Develop proposals for improvements on and off the State Highway System within Portland.

Bureau: BTE & TP&F

Required approval: Oregon Department of Transportation

Time: 1987-1988

Projected revenue: Dependent on project eligibility.

### State Energy Funds

Task: Develop transportation energy conservation projects.

Bureau: BTM, TP&F, BTE

Required approval: State

Time: 1987 on-going

Projected revenue: Dependent on project.

## State Lottery Funds

Task: Select specific C&E projects that will qualify as economic development projects.

Bureau: BTE & TP&F

Required Approval: State

Time: 1987 on-going

Projected revenue: Dependent on project.

## DEBT FINANCING OPTIONS

General Obligation Bonds

Revenue Bonds

Privatization

Task: Research the applicability of debt financing options to PDOT. Develop a master-plan for project implementation.

Bureau: TP&F & Office of Fiscal Administration (OFA)

Required approval: City Council

Time: 1987-88

Projected revenue: Not a source of new revenue. Technique to smooth out cash flow.

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ATTACHMENT 1

TRANSPORTATION FUNDS

FY 86-87 APPROVED BUDGET ASSUMPTIONS: \$56.8 MILLION

1. Includes all direct expenditures for the bureaus of Transportation Engineering, Transportation Planning & Finance, Traffic Management, and Maintenance.
2. Includes all direct expenditures for Special Appropriations, including Senior Citizen Sidewalk Program, Towing Refund Program and Stock Account.
3. Excludes interagencies between Transportation Operation Fund bureaus.
4. Excludes Street Light Fund interagencies with Transportation Operating and Transportation Construction Funds.
5. Excludes Transportation Construction Fund interagencies with Transportation Operating Fund.
6. Includes all other service reimbursements outside PDOT, e.g., to Sanitary Fund, General Fund, Fleet, Water, etc.
7. Excludes cash transfers between Construction Fund, Operating Fund and Street Lighting Fund.
8. Excludes street lighting contingency and maintenance stock account.
9. Includes non-budgeted federal grants, FHWA construction share and the HCD/LID construction shares.
10. Excludes reserves for State Tax Street Fund and Parking Meter Fund.
11. Excludes sanitary sewer interagency.
12. Includes street light reserve for future years.

GENERAL REVENUES	31.1	CONTRACTS	.9
Utility Franchise Fees	9.3		
State Highway Trust Fund	8.2	GRANTS	11.5
Parking Charges	5.0	FAIX	6.1
City/County Road Contract	5.8	FAU	.4
Miscellaneous Other	2.8	HBRR	.5
		MISC.	.4
STREET LIGHT LEVY	7.6	UMTA	2.2
		HCD	1.9
COST RECOVERY/SERVICE REIMBURSEMENT	3.4		
			Total \$ 56.8
PROPERTY OWNERS	2.3		

ATTACHMENT 2

DOCUMENTATION OF UNMET NEED  
*Repair + Preservation Components*

PAVEMENT:

Pavement backlog is actual center-line miles times a factor of \$91,000: 348 x \$91,000 = \$31.7; 394 x \$91,000 = \$35.8; 418 x \$91,000 = \$38.0; 480 x \$91,000 = \$43,634,500. Beginning in FY88-89 and each FY through FY 91-92 the backlog is assumed to increase at 45 center-line miles per year based on a 45 mile average for the last five years. This represents a \$4.1 million annual need. 45 x \$91,000 = \$4,095,000.

STRUCTURES:

The structures unmet need was calculated based on information contained within the Structural Capital Evaluation Project. Of the sixteen bridges in poor or very poor condition, four bridges have critical elements that triggered their inclusion in the first year of the ten year CIP:

Bridge	Cost	Year in CIP
3	\$ 260,000	1
93	350,000	1
95	65,000	1
96	65,000	1
	<hr/>	
	\$ 740,000	

Future year projections are based on the ten year CIP.

Year	Total
1988	\$ 785,000
1989	1,630,000
1990	1,560,000
1991	715,000
1992	2,270,000

TRAFFIC SIGNALS:

Intersection signal hardware

Unmet need was based on the number of hardware wiring units exceeding useful life multiplied by the cost of replacement - 92 x \$45,000 = \$4,140,000. For future years unmet need was calculated based on the number of hardware units that exceed their useful life and need to be replaced each year.

Year	# Reaching Useful Life	# Replaced	Unmet Need	Cost(\$45,000 each)
1988	13	12	1	\$ 45,000
1989	5	4	1	45,000
1990	14	4	10	450,000
1991	24	4	20	900,000
1992	19	4	15	675,000

## Signal controllers

Unmet need for controllers was based on the number exceeding useful life multiplied by the cost of replacement. The replacement cost to replace entire controllers and cabinets is \$6,500. It cost, \$3,000 to replace the controllers. All controllers reaching useful life in the next five years need new cabinets. Existing unmet need is 188 x \$6,500 for a total of \$1,222,000.

Future unmet need was based on the rate of replacement for controllers exceeding their useful life in that year:

Year	# Reaching Useful Life	# Replaced	Unmet need	Cost (\$6,500)
1988	36	18	18	\$117,000
1989	23	10	13	84,500
1990	0	0		
1991	0	0		
1992	0	0		

## TRAFFIC SAFETY AND CONGESTION MODIFICATIONS:

The unmet need was calculated for 40 major intersections in critical condition at a modification cost of \$28,330 for a total of \$1,133,200. The calculation is based on 1985 accident data and therefore is low.

Future unmet need was calculated based on annexation, increased traffic growth and existing funding levels. The data used to calculate the impact of funding levels on "A" intersections is based on 40 intersections. The unmet need for the 40 intersections was calculated for 1986-87, therefore these 40 intersections are subtracted to reach unmet need for future years. Unmet need for 1988 is 4 intersections. To arrive at unmet need for 1989 through 1992, these 4 intersections are subtracted.

Year	"A"	"A" if unmet need is met	Modified	Unmet need	cost (\$28,330)
1988	46 - 40	6	2	4	\$113,320
1989	46 - 44	2	2	0	
1990	45 - 44	1	2	0	
1991	44 - 44	0	0	0	
1992	43 - 44	0	0	0	

If all 40 intersections were modified in 1987, "A" intersections would increase to 6 given annexation and increased traffic growth. If these six were modified (two intersections modified with existing funding and four intersections at an average cost of \$28,330) then existing funding would maintain major intersections below a level of 1.8 accidents per million entering vehicles; accident costs less than \$1,000 per million entering vehicles; and a predicted peak hour reduction in approach speed less than 60%. Once "A" intersections were improved to this point, existing funding could be increased for "B" level intersections.



Year	SUMMARY						"A"
	Pavement	Structures	Lights	Hardware	Controllers	Signals	
FY86-87	43,634,500	740,000	0	4,140,000	1,222,000	1,133,200	-50,869,700
FY87-88	4,100,000	785,000	0	45,000	117,000	113,320	-5,160,320
FY88-89	4,100,000	1,630,000	0	45,000	84,500	0	-5,859,500
FY89-90	4,100,000	1,560,000	0	450,000	0	0	-6,110,000
FY90-91	4,100,000	715,000	0	900,000	0	0	-5,715,000
FY91-92	4,100,000	2,270,000	0	675,000	0	0	-7,045,000

**PDOT REQUIREMENTS AND RESOURCES**

A mathematical model was used to arrive at PDOT requirements and resources. The following assumptions were made:

1. Annexation increments are based on incremental City/County Road Contract forecasts.
2. Administrative money is allocated 60% to O&M, 40% to R&P and 10% to C&E.
3. An inflation rate of 4% using FY86-87 budget as base value.
4. The FAIX grant program was assumed to be 120% x FAIX grant resources to account for match for FY87-88 and FY88-89; For FY90 and beyond a, base \$6 million FAIX program was assumed.
5. A 10% inflation rate was used for the 3 year period ending FY89-90 with FY86-87 used as the base year. FY 90 and beyond assumed an inflation rate of 4%.

*Assum catch FY86*

	FY86-87	FY87-88	FY88-89	FY89-90	FY90-91	FY91-92
Requirements	56.8	63.3	85.7	65.9	69.1	72.0
Resources	56.8	62.4	81.7	48.0	44.6	45.0
Revenue						
Shortfall	0.0	(0.9)	(4.0)	(17.9)	(24.5)	(27.0) = 74.3

**CUMULATIVE SHORTFALL**

The cumulative shortfall was calculated by adding unmet need and revenue shortfall.

Year	Shortfall Unmet need	Shortfall Revenue	Total
FY86-87	\$50.9	0.0	\$50.9
FY87-88	5.0	0.9	5.9
FY88-89	5.9	4.0	9.9
FY89-90	6.1	17.9	24.0
FY90-91	5.7	24.5	30.2
FY91-92	7.0	27.0	34.0
Total	80.6	74.3	154.9



*P. 24 sh deficit totals requirements*

