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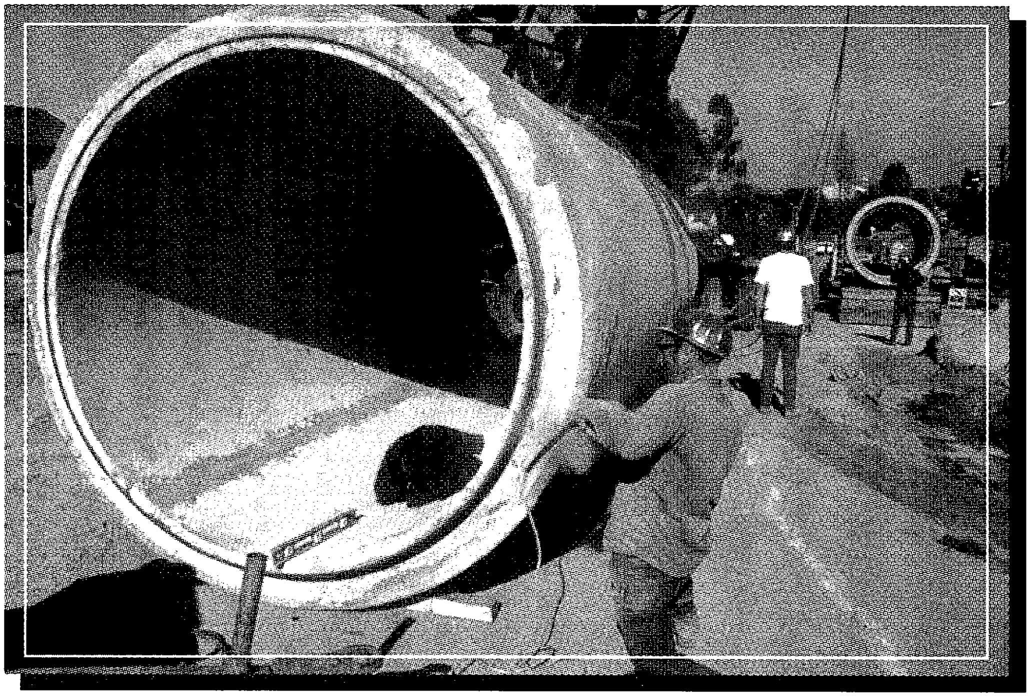
NEXUS STUDY IN SUPPORT OF METROPOLITAN'S NEW DEMAND CHARGE

JANUARY 1995



MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

41220

Nexus Study
In Support of Metropolitan's New Demand Charge

January 1995

The Metropolitan Water District of Southern California

Planning and Resources Division
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Contents

Section 1
Introduction

Purpose of Study

Metropolitan has developed a new water rate structure that provides for more stable water rates while securing revenues, retaining operating flexibility and resource management incentives, and distributing costs in an equitable manner. This new rate structure consists of the following components:

- *Water rate* using the current basic commodity charge (noninterruptible water rate structure with seasonal storage service and interim agricultural water);

- *Readiness-to-serve charge* to recover the debt service not paid from taxes necessary to meet reliability and quality needs of existing demands;

- *New demand charge* to recover the capital costs associated with accommodating new demands on Metropolitan's system;

- *Treated water peaking charge* to encourage agencies that meet their peak summer demands with Metropolitan's treatment facilities to change their behavior or more equitably share in the cost of facilities to meet their needs; and a

- *Connection maintenance charge* to recover a portion of the costs associated with maintaining Metropolitan service connections.

These rates provide most of the revenue of Metropolitan. However, Metropolitan also receives revenue from the following sources:

- *Ad valorem taxes*, which Metropolitan collects on property within the district for the purposes of carrying on the operations and paying the obligations of the district; and

- *Hydropower sales*, which Metropolitan generates during the operation of the water distribution system.

This study addresses only the new demand charge, which will be levied by Metropolitan pursuant to its authority over water rates and charges under the Metropolitan Water District Act and the California Government Code. By recovering the costs associated with accommodating new demands on Metropolitan, the new demand charge in effect requires each agency responsible for increased demands to help pay the cost of facilities necessary to serve anticipated new demands. The new demand charge was structured by Metropolitan with the intent of permitting member agencies and their subagencies, at their option, to establish mechanisms such as connection fees to collect the new demand charges. Through these mechanisms, Metropolitan's new demand charge would provide a means for water users responsible for growth in demands at the member agency or subagency level to pay the costs of Metropolitan facilities required to serve growth.

This study is furnished to establish the nexus (connection) between the new demand charge and the costs for new facilities to service new demands on Metropolitan's system. In doing so, this study documents the allocation of a portion of Metropolitan's Capital Improvement Program costs to projections of new demands.

Under California law (Government Code §66001), a local agency may impose a fee targeted at new development only if it first establishes the connection between the development and the facilities to be provided. The agency must also show that the amount of the fee does not exceed the cost of the proportionate amount of the facilities necessary to serve the new development. This connection usually is established through preparation of a nexus study.

Metropolitan does not propose to directly levy a connection fee or other charge on new development. The purpose of this study is to provide the documentation about the facilities to be funded through the new demand charge that member agencies and subagencies may need in preparation for levying their charge, if any, on new development.

This study will be reviewed annually and updated as required whenever there are significant changes in the facility programs and demand projections.

Organization of Study

Section 1 of this study introduces the concept of the new demand charge and its purpose, and provides background information on Metropolitan, its member agencies, and availability of water supplies. Section 2 describes historic water use and methodology for forecasting future water use. Section 3 describes the Capital Improvement Program and lists costs allocated to the new demand charge. Section 4 describes how the new demand charge is calculated. Appendix A illustrates two different approaches member agencies and subagencies might use to collect revenues from new demand to pay new demand charges to Metropolitan. Appendix B presents an allocation of water quality and treatment projects between existing and new demands. This information will help Metropolitan and its member agencies determine whether costs of additional treatment facilities warrant a separate change. Currently, water quality treatment projects are excluded from new demand charge because the costs are included in Metropolitan's treatment surcharge. Appendix C consists of a summary of the legal review for the Nexus Study.

Overview of the New Demand Charge

The new demand charge will be imposed as a per acre-foot charge on increased water demand on Metropolitan's distribution system. The charge is intended to recover the corresponding capital costs of the projects or portions of projects needed to service new demands. Fundamentally, the charge is equal to Metropolitan's costs of meeting new demands divided by the projected regional increase in demand.

The basic steps in determining the new demand charge are as follows:

- Determine the base water demands from which future increases in demands will be measured;
- Estimate the increase in regional water demands, based on projections of long-term demographics from adopted regional growth management plans;
- Determine which projects or portions of projects in Metropolitan's Capital Improvement Program are needed to serve the projected increases in water demand;
- Estimate the capital costs for the new facilities needed to serve the new demands; and
- Calculate the new demand charge as presented in Section 4 of this study.

The new demand charge will be implemented in fiscal year 1995-96. This study evaluates the new demand charge over a 25-year period, from fiscal year 1995-96 through 2019-20.

Background

The Metropolitan Water District of Southern California

Metropolitan was created in 1928 to provide supplemental water to the cities and communities of Southern California. Metropolitan's 5,153 square-mile service area includes most urbanized portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Nearly 16 million people—half the population of California—live in Metropolitan's service area. Metropolitan provides about 60 percent of the water used in Southern California.

Since its formation, Metropolitan has provided imported water to supplement the local supplies available to the people and economy of Southern California. Metropolitan relies on two sources of water supply: the State Water Project, which carries water from the Sacramento-San Joaquin Delta; and Metropolitan's Colorado River Aqueduct.

In recent years, constraints on the amount of imported water available to Metropolitan combined with increasing costs of water resources development, more stringent water and wastewater quality requirements, and growing environmental concerns have led Metropolitan to assume a broader responsibility for sound water management across Southern California.

Metropolitan and its member agencies have assumed a leadership role in developing innovative approaches to the efficient management of water resources. An Integrated Resource Planning (IRP) effort has been developed to promote a cost-effective and responsible balance of local supply development, regional water supply projects, and facility improvements. As part of this resource planning effort, Metropolitan is increasing the available supply of imported water through large-scale expansions of its transmission, storage, and treatment facilities.

Member Agencies of Metropolitan

Metropolitan is composed of 27 member agencies—14 cities, 12 municipal water districts, and one county water authority. Metropolitan supplies its member agencies with treated and untreated water. The member agencies and subagencies in turn combine it with local water resources for delivery to their customers. Member agencies vary in their reliance on Metropolitan; some depend on Metropolitan for virtually all their water, while others use Metropolitan's water only during peak periods (periods of high demand), for groundwater replenishment, and/or as a backup supply.

Availability of Water Supplies

Southern California has a wide array of water supply resources available to meet the water needs of the region. These resources consist of both local and imported supplies. Local supplies include groundwater and surface water runoff, wastewater reclamation, groundwater and ocean desalination, groundwater conjunctive use programs, and water conservation. Imported supplies include deliveries from the State Water Project, Colorado River Aqueduct, and water transfers.

Virtually all of these resources appear worthwhile when considered individually. However, their full implementation would result in duplicated efforts, unnecessary costs, and unacceptable water rate increases. To prevent this, Metropolitan's IRP process has evaluated the feasible combinations of resources in terms of water supply reliability, costs, risk, environmental and institutional concerns, and financing. Metropolitan's proposed Capital Improvement Program reflects the facilities necessary to serve the schedule and magnitude of required imported water deliveries as determined through the IRP process.

Metropolitan's Mission Statement and Goals

In 1992, Metropolitan's Board of Directors adopted the following mission statement:

The mission of the Metropolitan Water District of Southern California is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

The Board of Directors subsequently adopted goals that define methods of accomplishing Metropolitan's mission and achieving a reliable supply of high-quality water.

The Board of Directors expressed Metropolitan's commitment to maintain a balance of fixed and variable revenue sources; adequately consider the environmental effects and appropriate mitigation of its activities; operate in a cost-effective manner; recruit and retain a qualified staff that reflects the diversity of the service area; maintain a safe and healthful working environment; vigorously protect Metropolitan's legal interests; and maintain adequate systems of internal controls, including an independent audit function.

Reliability Goal

To accomplish its mission statement with regard to water supply reliability, Metropolitan's Board of Directors adopted the following goal:

Metropolitan will provide 100 percent of full service wholesale demands to its member agencies 90 percent of the time. During adverse hydrologic conditions, such as a repeat of the 1991 drought, Metropolitan will never provide less than 80 percent of full service demands to its member agencies.

This reliability goal expresses Metropolitan's objective of achieving a measurable overall performance standard. Although specified as a standard for wholesale water supply, it fully accounts for local resource management alternatives that directly reduce the demands for Metropolitan's imported water supplies. The reliability goal has guided the subsequent IRP and Capital Improvement Program activities at Metropolitan and has defined the minimum level of service upon which member agencies can rely in their own planning process.

Metropolitan has pledged to develop, construct, and operate the facilities necessary to achieve its reliability goal in a cost-effective manner. The costs associated with achieving this reliability goal for new demands on Metropolitan's system will be recovered through the new demand charge.

Metropolitan is simultaneously confronted with the challenges of operating and maintaining an aging physical system. The current distribution system cannot reliably deliver the supplies required to serve existing demands under adverse hydrologic conditions. Therefore, a significant part of the proposed Capital Improvement Program is designed to increase the supply reliability of the system to service existing demands. It is intended that these costs be recovered through the readiness-to-serve charge. The separation of project costs between these two charges is documented in this report.

Section 2
Water Use

Historic Water Use

Regional Water Use

Metropolitan tracks total regional water use through its water sales records and through water use reports prepared by the member agencies at the end of each fiscal year. These combined data show that total regional water use in Metropolitan's service area increased 32 percent during the 1980s—from 3.0 million acre-feet in 1980 to 4.0 million acre-feet in 1990. Most of this increase was due to growing urban demands, which increased 37 percent, while agricultural water use increased only 1 percent.

With the onset of the economic recession in late 1990 and the implementation of mandatory drought rationing effective February 1, 1991, total regional demands rapidly declined. By 1992, total regional demands had decreased 20 percent from their 1990 level, to 3.2 million acre-feet. Slightly less than half of this reduction can be attributed to the recession, with the remainder attributable to extreme wet weather and continued drought conservation. In 1993, regional demands increased slightly as lingering drought conservation behavior began to diminish.

Metropolitan Water Use

Demand on Metropolitan is the total regional demand less local water produced from groundwater, surface water, reclaimed water, and water imported through the Los Angeles Aqueduct by the City of Los Angeles.

As indicated by Metropolitan's water sales records, demands on Metropolitan increased significantly during the 1980s. In fiscal year 1979-80, Metropolitan supplied approximately 1.3 million acre-feet of the region's total water demand. In 1989-90, Metropolitan's deliveries had grown to a record high of 2.5 million acre-feet. Demands in fiscal year 1989-90 are considered above normal due to above-average temperatures and below-average rainfall. In 1990-91, the sixth year of a severe drought, Metropolitan fell short of meeting demand.

As with the total regional demands, the demands on Metropolitan have decreased in recent years from the 1989-90 level. Demands in fiscal year 1992-93 of about 1.91 million acre-feet are considered below normal due to below-average temperatures, above-average rainfall, and the continued effects of the economic recession and drought-related conservation. Demands on Metropolitan in 1993-94, also a below normal year, rose slightly to about 1.93 million acre-feet.

Base Average Metropolitan Water Use

The new demand charge is calculated using the increase in water purchases above a base amount, which reflects the expected normal demands for each member agency. A member agency's new demand charge base is the largest of the following: (1) the three-year average of its imported water purchases for fiscal years 1989-90 through 1991-92, excluding one-time drought storage (OTDS) agreements; (2) the four-year average of its imported water purchases for fiscal years 1989-90 through 1992-93, excluding OTDS agreements and long-term seasonal storage deliveries attributable to May and June 1993; and (3) the readiness-to-service allocation for fiscal year 1995-96, which is the two-year average of its imported water purchases for fiscal years 1992-93 through 1993-94, excluding long-term seasonal storage service, cyclic storage, direct groundwater replenishment deliveries, OTDS agreements, Cooperative Storage Program deliveries through April 12, 1994, and 1993 Demonstration Program deliveries. Metropolitan considers the largest of the three averages to more fairly represent a member agency's average use of imported water because it eliminates the effect of abnormally low water sales in fiscal year 1992-93. In addition, the new demand charge base should be greater than or equal to the readiness-to-serve base.

Table 2-1 shows the new demand base for each member agency.

The base amount of 2.18 million acre-feet closely matches the expected normal weather demands on Metropolitan's system predicted through statistical water demand forecasting for normal economic conditions. This would be the level of deliveries through Metropolitan's distribution system if the existing system were fully capable of reliably meeting current normal demands.

Metropolitan's system can deliver higher peak demands than the current calculated base demand. However, those higher deliveries are at a reliability less than desired.

Projected Water Demands

Methodology

Planning for water supply reliability requires detailed knowledge of the region and the factors that influence its water use characteristics. Metropolitan projects water demands for the region by incorporating forecasts of population, housing, jobs, and income from the adopted regional growth management plans provided by the Southern California Association of Governments (SCAG) and the San Diego Association of Governments (SANDAG). Currently, Metropolitan references the Draft 1993 Regional Comprehensive Plan developed by SCAG and the Preliminary Series 8 forecasts issued by SANDAG.

Table 2-1

New Demand Charge Base (acre-feet)

Member Agency	New Demand Charge Base
City of Anaheim	24,944
City of Beverly Hills	13,614
City of Burbank	20,446
Calleguas MWD	99,025
Central Basin MWD	115,834
Chino Basin MWD	76,265
Coastal MWD	41,441
City of Compton	5,026
Eastern MWD	55,603
Foothill MWD	9,610
City of Fullerton	12,262
City of Glendale	26,456
Las Virgenes MWD	18,525
City of Long Beach	42,539
City of Los Angeles	358,504
MWD of Orange County	243,828
City of Pasadena	22,638
San Diego County Water Authority	559,247
City of San Fernando	903
City of San Marino	1,327
City of Santa Ana	15,840
City of Santa Monica	8,889
Three Valleys MWD	69,664
City of Torrance	20,311
Upper San Gabriel Valley MWD	71,899
West Basin MWD	167,634
Western MWD of Riverside County	78,177
Total	**2,180,451**

The demographic factors affecting water use include the following:

- *Family Size.* Increases in family size increases household water use. However, because a significant amount of household water use is fixed (such as landscaping), water use per capita actually decreases as family size expands, and vice versa.

- *Housing Mix.* Single-family households typically use more water than multi-family households because of additional water using appliances and more outdoor water use per capita.

- *Income.* Increases in income tend to translate into additional water using appliances and greater outdoor water use, both of which increase per capita water use.

- *Industry Mix.* Increases in water-intensive industries (e.g., manufacturing that require washing or cooling) can increase per capita water use. Increases in industries such as finance decrease per capita water use.

- *Inland Growth.* Metropolitan's service area spans coastal, inland, and desert climate zones. Much of the growth in housing and development is projected to be in the inland and desert zones (e.g., Riverside and San Bernardino counties), which increases overall per capita water use.

Other factors that influence water use include the following:

- *Water Conservation.* Long-term water conservation efforts decrease per capita water use.

- *Price.* Increases in water prices tend to decrease per capita water use.

Metropolitan projects water demands for the entire region by incorporating these demographic factors into an econometric demand model known as *MWD-MAIN* (Municipal and Industrial Needs). This model was developed by the U.S. Army Corps of Engineers, Institute for Water Resources, in the early 1970s for use throughout the United States. Consultants for Metropolitan calibrated it to match Southern California conditions.

In addition, Metropolitan uses an *Integrated Resource Planning Simulation Model* (IRPSIM) to simulate the effects of different hydrologic and climatic conditions on future supply and demand. IRPSIM uses 70 years of climatic data to estimate the impact on projected agricultural, municipal, and industrial demands for the entire region, and impacts on local and imported water supplies. IRPSIM then determines the resultant water demands on Metropolitan.

Demographic Trends

Population

Between 1980 and 1990 the population in Metropolitan's service area increased 25 percent from 12.1 million to 15.1 million. During this period Metropolitan's service area accounted for over 50 percent of the state's population. The recent economic recession and an expected decrease in birth rates has slowed the annual average rate of population increase in the region from 2.4 percent during the 1980s to an expected rate of 1.5 percent between 1990 and 2010. Although the rate of population increase is expected to slow, over 233,000 people per year will be added to the region's population between 1990 and 2010. At this rate, regional population will reach 17.6 million by year 2000, and 19.7 million by year 2010. Metropolitan's planning horizon currently extends to year 2020 when population is expected to reach 21.7 million (Figure 2-1).

In addition to slowing the rate of population increase, the recession has also had an impact on the components of population increase. The poor job market is the primary reason that net migration, which was the largest component of annual increase during the 1980s, has dropped off. Figure 2-2 illustrates historic and estimated annual rates of population increase between 1990 and 2020.

Housing

In Metropolitan's service area, occupied households increased at an average annual rate of 80,000—from 4.3 million in 1980 to 5.1 million in 1990. During this same period the average family size increased from 2.79 to 2.96 persons per household. Multi-family housing grew at a faster rate than single-family housing in the 1980s, resulting in an increasing share of total households being made up of multi-family households. In 1980, multi-family households accounted for 42 percent of total households, increasing to 44 percent by 1990.

In the short-term, the recent recession has had a major impact on the housing market. Residential building permits in Southern California, a leading indicator of housing starts, have fallen 78 percent from an annual peak of 162,000 in 1988 to an estimated low of 35,000 in 1993. However, both the Construction Industry Research Board and the University of California Los Angeles Business Forecasting Project have forecast a modest recovery in residential building permits for 1994.

In general, the trends in housing that were witnessed during the 1980s are projected to continue through year 2010 as total households in Metropolitan's service area increase 30 percent—from 5.1 million in 1990 to 6.6 million in year 2010. By 2010, multi-family households will make up 46 percent of total housing. Family size is projected to peak in year 2000 at 3.01 persons per household and then gradually decline to 2.98 persons per household by year 2010. Even though the demographic trends of increasing multi-family share and increasing household size are working to slow the rate of increase in residential water use, forecasts of water demand reveal

Figure 2-1
POPULATION IN METROPOLITAN'S SERVICE AREA

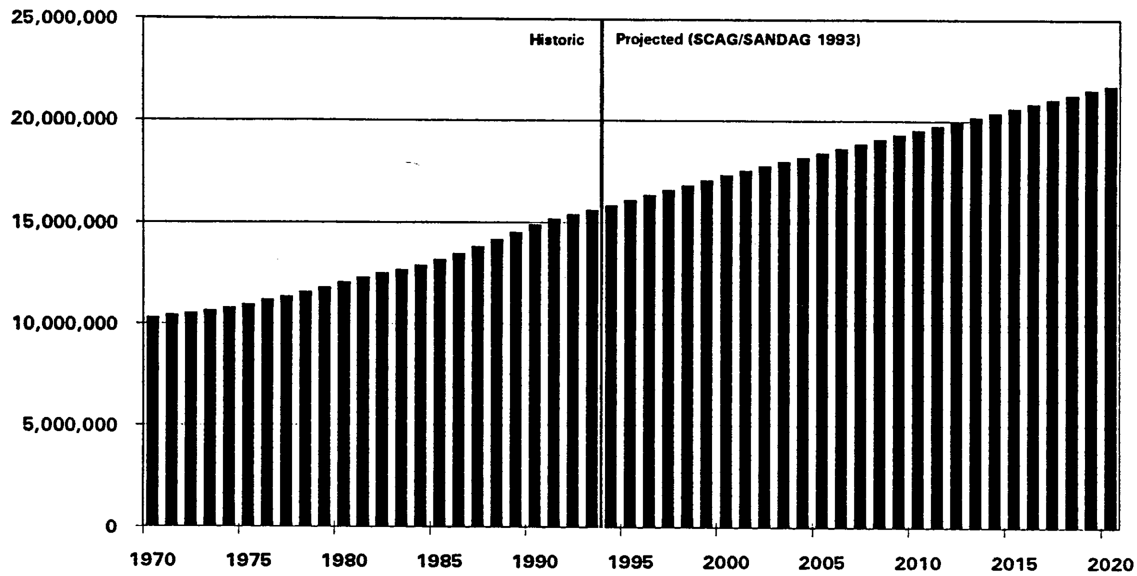
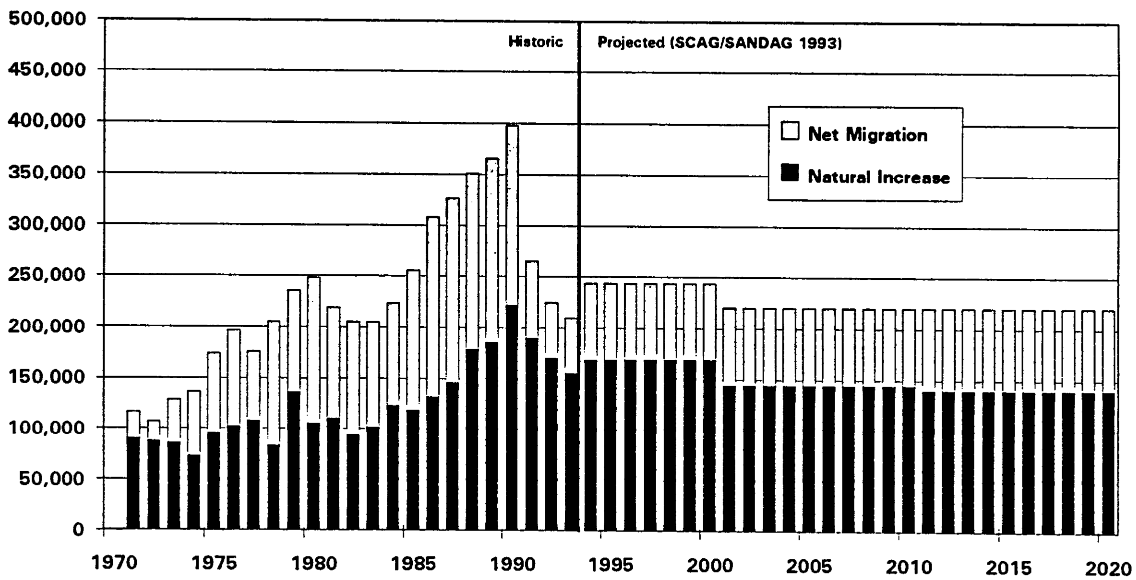


Figure 2-2
ANNUAL POPULATION GROWTH IN METROPOLITAN'S SERVICE AREA



that residential water use will remain the largest component of urban water use in Metropolitan's service area and will likely increase its share from current levels. Table 2-2 summarizes trends in housing in Metropolitan's service area.

Table 2-2
Regional Housing Trends

	1980	1990	2000	2010	2020
Single-Family Households (millions)	2.52	2.85	3.18	3.55	3.93
Multi-Family Households (millions)	1.82	2.25	2.65	3.07	3.41
Total Households (millions)	4.34	5.1	5.83	6.62	7.34
Family Size (persons per household)	2.79	2.96	3.01	2.98	2.96

Jobs

Total jobs in Metropolitan's service area increased at an average annual rate of 2.7 percent—from 6.0 million in 1980 (56 percent of total jobs in the state) to 7.6 million by 1990 (55 percent of total jobs in the state). The fastest growing sectors of the economy during this period were services (7.9 percent annually) and construction (3.9 percent annually). Manufacturing jobs were one of the slowest growing sectors during the 1980's, increasing an average of 0.1 percent a year.

The severity and duration of the recent recession has had a tremendous impact on job base in both the state and in Metropolitan's service area. Southern California has experienced job losses because of its traditionally volatile construction industry and the added impact of defense cutbacks on the large share of defense contractors and aerospace firms that are located in Southern California. These two unique factors, coupled with the nation-wide recessionary pressures and increased competition, have reduced the job base in Metropolitan's service area by an estimated 640,000 jobs since 1990. Job losses and the slow growth in housing caused by the recession have significantly reduced regional water use since 1990.

Jobs are expected to begin to increase by 1995. By year 2010, total jobs are expected to increase 30 percent—from 7.6 million in 1990 to 9.8 million. This growth reflects an average annual increase of 1.5 percent. Future job growth will be slower than that experienced during the 1980s, with the fastest growing sectors being services (2.5 percent annually) and retail trade (2.0 percent annually). The manufacturing industry's share of the job base is expected to continue to decline gradually after the recession through year 2010, decreasing 0.1 percent a year. Table 2-3 shows commercial and industrial jobs in Metropolitan's service area.

Table 2-3
Regional Jobs Data
(millions)

	1980	1990	2010
Commercial Jobs	4.58	6.17	8.45
Industrial Jobs	1.31	1.32	1.29
Total Non-Farm Jobs	5.89	7.49	9.74

Demand Forecasts

Based on the demographic trends and estimates of local water supplies provided by the member agencies, total regional water demands and demands on Metropolitan were projected through the year 2020. The total water use in Metropolitan's service area is projected to increase from an actual 4.0 million acre-feet in 1990 to a projected 5.0 million acre-feet in 2020 (projected assuming normal weather and full implementation of conservation practices). Under drier year conditions, which occur 10 percent of the time, regional demands are projected to be 6.5 million acre-feet in the year 2020.

With the demographic data used to generate the estimates of water demand growth, it is possible to split this growth between increased numbers of water users and from more intensive water use by existing water users. Due to changes in family size, income, and other factors, average household use will increase approximately four percent. Commercial and industrial water use will increase approximately three percent due to changes in productivity, types of businesses and other factors. Overall, the change in water use due to more intensive use by existing water users is projected to be 115,000 acre-feet, or fifteen percent of the projected increase in water demand.

Local water supplies, including groundwater, reclamation, and groundwater recovery projects, are expected to increase from 1.50 million acre-feet in 1990 to about 2.20 million acre-feet by year 2020.

Resulting normal weather demands for Metropolitan's imported water are expected to increase to 2.76 million acre-feet by year 2020 from the base average of 2.18 million acre-feet. Therefore, the growth in demand for Metropolitan water represents an increase of 580,000 acre-feet. Table 2-4 compares the base average demand to the projected normal demand in year 2020 for each member agency.

Although normal year conditions were used in the calculation of the new demand charge, many of the facility improvements of Metropolitan's proposed Capital Improvement Program are sized and timed to meet above-normal demand conditions. Projections at a drier year condition indicate demands on Metropolitan

Table 2-4

Projected New Demands on Metropolitan (acre-feet)

Member Agency	New Demand Charge Base Amount	Projected New Demands	Projected Year 2020 Demand(1)
City of Anaheim	24,944	7,249	32,193
City of Beverly Hills	13,614	2,036	15,650
City of Burbank	20,446	1,188	21,634
Calleguas MWD	99,025	33,098	132,123
Central Basin MWD	115,834	0	83,651
Chino Basin MWD	76,265	42,045	118,310
Coastal MWD	41,441	14,104	55,545
City of Compton	5,026	0	4,500
Eastern MWD	55,603	115,009	170,612
Foothill MWD	9,610	1,326	10,936
City of Fullerton	12,262	0	9,856
City of Glendale	26,456	0	20,644
Las Virgenes MWD	18,525	12,506	31,031
City of Long Beach	42,539	1,746	44,285
City of Los Angeles	358,504	0	315,495
MWD of Orange County	243,828	27,562	271,390
City of Pasadena	22,638	0	20,394
San Diego County Water Authority	559,247	244,882	804,129
City of San Fernando	903	0	812
City of San Marino	1,327	0	1,100
City of Santa Ana	15,840	1,895	17,735
City of Santa Monica	8,889	166	9,055
Three Valleys MWD	69,664	31,787	101,451
City of Torrance	20,311	0	15,220
Upper San Gabriel Valley MWD	71,899	5,921	77,820
West Basin MWD	167,634	0	124,639
Western MWD of Riverside County	78,177	171,871	250,048
Total	2,180,451	714,391	2,760,258

(1) Normal-year conditions.

could reach 3.25 million acre-feet in the year 2020, 19 percent more than normal year demands. Metropolitan's reliability goal of supplying 100 percent of full service demands to its member agencies 90 percent of the time commits Metropolitan to delivering these above-normal demands in dry years.

Section 3
Capital Improvement Program

Purpose of Capital Improvement Program

Metropolitan periodically updates a Capital Improvement Program (CIP) to guide its planning of new facility construction and rehabilitation of existing facilities. The program is in conjunction with other water management programs, such as resource development, water reclamation, and water transfers.

This plan has two objectives:

- To improve reliability and to maintain existing delivery and support facilities; and
- To increase the ability to provide water.

Part of Metropolitan's CIP is to maintain and improve the system and supply reliability for existing demands. In a dry year, imported water supplies available to Metropolitan are estimated to be approximately 1.5 million acre-feet (about 700,000 acre-feet from the Colorado River Aqueduct, 600,000 acre-feet from the State Water Project, and 200,000 acre-feet from existing storage). This supply is less than the current normal demand of 2.18 million acre-feet, indicating an immediate need to increase reliable supplies for existing demands on the system.

The other part of the CIP is to increase the supply, treatment, and delivery capacity for future demands. As described in Section 2, normal water demands on Metropolitan are expected to increase to 2.76 million acre-feet in a normal year and 3.25 million acre-feet in a dry year.

Some of the projects contained in Metropolitan's fiscal year 1994-95 CIP are listed in Table 3-1. Projects intended to improve existing system reliability and rehabilitate facilities are grouped at the heading "Total Reliability/Rehabilitation/Administrative Services" and are not shown individually. Only projects expected to be completed in fiscal year 1995-96 or later are included. Table 3-1 also shows the escalated, estimated annual expenditures for the CIP from fiscal year 1995-96 to 2019-20. Cost estimates were prepared by Metropolitan using standard construction cost estimating procedures.

Allocation to New Demand Charge

Each project in the CIP was evaluated to determine whether it replaces or rehabilitates a facility, constructs new facilities to service new demands, or some combination of both. Costs of replacing or rehabilitating existing facilities or providing administrative services for the Metropolitan system were excluded from

Table 3-1

Based On: Optimal Case (10/94) - w/o Contingency

Capital Improvement Program

94/95 - 19/20

($ Thousands - Escalated)

Contingency Included (Yes = Y No = N) N

DISTRIBUTION AND STORAGE PROJECTS	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	Total Program 94/95 - 19/20
Total Reliability/Rehab./Admin. Service	62,681.7	56,526.7	65,054.3	105,524.4	85,384.4	40,202.9	42,213.0	44,323.7	46,539.8	48,866.8	51,310.2	53,875.7	56,569.5	59,397.9	62,367.8	65,486.2	68,760.5	72,198.6	75,808.5	79,598.9	83,578.9	87,757.8	92,145.7	96,753.0	101,590.6	106,670.2	1,811,187.9
Allen-McColloch Pipeline Purchase	19,657.3	8,110.2	7,683.0	7,600.0	7,600.0	7,600.0	7,600.0	7,600.0	7,600.0	7,600.0	7,600.0	4,634.5	4,634.5	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	-	-	-	-	132,519.5
CPA Interim Flow Augmentation Project	-	-	-	1,823.3	8,614.9	9,045.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19,483.8
South (Orange) County Pipeline - Joint Participation & Purchase	24,520.7	-	-	-	-	155.2	4,124.3	4,065.4	4,018.8	3,982.0	3,960.0	3,952.1	3,952.7	3,970.7	4,000.0	4,041.3	3,717.9	3,779.1	2,467.9	2,540.8	2,629.1	5,791.1	-	-	-	-	85,669.1
Treated Water Distribution	44,178.0	8,110.2	7,683.0	9,423.3	16,214.9	16,800.8	11,724.3	11,665.4	11,618.8	11,582.0	11,560.0	8,586.6	8,587.2	6,970.7	7,000.0	7,041.3	6,717.9	6,779.1	5,467.9	5,540.8	5,629.1	8,791.1	-	-	-	-	237,672.4
Domenigoni Valley Reservoir	211,182.6	360,970.0	353,329.8	330,855.7	150,464.0	12,895.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,419,697.2
Total Domenigoni Reservoir	211,182.6	360,970.0	353,329.8	330,855.7	150,464.0	12,895.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,419,697.2
Inland Feeder	34,500.0	132,742.4	230,086.0	256,309.2	149,781.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803,418.5
Total Inland Feeder	34,500.0	132,742.4	230,086.0	256,309.2	149,781.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803,418.5
San Diego Pipeline No. 6	6,064.3	17,338.3	55,537.8	109,693.8	50,394.6	25,768.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264,796.9
Total San Diego Pipeline No.6	6,064.3	17,338.3	55,537.8	109,693.8	50,394.6	25,768.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264,796.9
West Valley Area Study	338.5	118.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	456.5
West Valley Project	-	-	-	-	-	-	-	-	-	-	10,847.4	15,569.5	28,087.9	31,220.3	20,080.1	6,223.6	-	-	-	-	-	-	-	-	-	-	112,028.8
Total West Valley	338.5	118.0	-	-	-	-	-	-	-	-	10,847.4	15,569.5	28,087.9	31,220.3	20,080.1	6,223.6	-	-	-	-	-	-	-	-	-	-	112,485.3
Central Pool Augmentation Tunnel & Pipeline	-	-	-	-	3,743.7	4,011.6	9,939.1	9,988.5	13,360.2	118,050.6	119,390.9	134,160.0	135,806.3	-	-	-	-	-	-	-	-	-	-	-	-	-	548,450.8
Total Central Pool Augmentation (Distribution and Storage Projects)	-	-	-	-	3,743.7	4,011.6	9,939.1	9,988.5	13,360.2	118,050.6	119,390.9	134,160.0	135,806.3	-	-	-	-	-	-	-	-	-	-	-	-	-	548,450.8
Chino Basin Groundwater Storage Program	667.5	6,207.2	6,231.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,106.4
North Las Posas Basin Groundwater Storage Program	2,000.0	29,000.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31,000.0
Pasadena Groundwater Storage Program	-	-	-	-	510.5	1,072.1	1,125.7	13,297.1	13,962.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29,967.3
Additional Groundwater	-	-	-	-	19,867.0	19,867.0	19,867.0	19,867.0	19,867.0	19,867.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	119,201.7
Foothill Area Study	748.1	642.1	569.0	746.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,705.1
Total Conjunctive Use / GW Storage	3,415.6	35,849.3	6,800.7	746.0	20,377.5	20,939.0	20,992.6	33,164.0	33,828.9	19,867.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195,980.6
Desalination Demonstration Project	2,573.6	8,237.0	15,636.5	692.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27,139.3
Total Desalination	2,573.6	8,237.0	15,636.5	692.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27,139.3
Weymouth/Lake Mathews Area Study	625.5	1,440.2	232.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,298.1
Total Foothill and Weymouth	625.5	1,440.2	232.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,298.1
SUBTOTAL FOR DISTRIBUTION AND STORAGE PROJECTS	365,559.7	621,332.0	734,380.5	813,244.6	476,380.1	120,617.5	84,869.0	99,141.6	105,347.7	198,366.3	193,108.5	212,191.6	229,050.9	97,589.0	89,447.9	78,751.2	75,478.4	78,977.7	81,276.4	85,139.7	89,208.0	96,548.9	92,145.7	96,753.0	101,590.6	106,670.2	5,423,127.1

FILTRATION PROJECTS	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	Total Program 94/95 - 19/20
All Facilities - Discharge Elimination	170.4	5,487.8	144.8	38.5	35.3	23.8	22.2	23.3	12.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,958.6
All Filtration Plants & Distribution System - Chemical Spill Containment	9,296.0	8,546.8	1,653.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19,496.2
All Filtration Plants - Oxidation Retrofit Program	11,096.2	11,699.8	67,900.7	101,694.3	94,671.9	79,240.3	56,080.7	40,888.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	463,272.8
Diemer & Weymouth Filtration Plants - Install Emergency Generators	834.6	921.4	2,173.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,929.3
Diemer Filtration Plant - Miscellaneous Site Improvements	11,192.2	4,172.4	10,685.8	11,323.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37,373.6
Diemer, Weymouth & Jensen Filtration Plants - Sludge Handling Study	183.6	125.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	309.6
Filtr. Plants, Distr. System, & Colorado River Aqueduct - Backflow Prevention Assemblies	1,230.0	2,173.9	645.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,049.4
Jensen Filtration Plant - Expansion No. 1	19,810.2	6,866.3	1,900.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28,576.9
Jensen Filtration Plant - Replace Filter Media and Chemical Storage Tanks	229.3	157.6	120.5	3,697.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,204.4
Lake Perris Pumpback Expansion No. 3	1,970.2	3,730.4	961.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,661.6
Mills Filtration Plant - Expansion No. 2	44,295.6	27,317.5	9,093.1	2,220.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82,926.2
Mills Filtration Plant - Landfill	345.7	3,236.6	325.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,907.7
San Joaquin Reservoir - Improvement	3,688.4	13,551.1	3,572.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20,812.1
Skinner Filtration Plant - Miscellaneous Site Improvements	-	-	202.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	202.1
Skinner Filtration Plant - Emergency Power Generating System	1,368.3	678.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,046.5
Skinner Filtration Plant - Install Effluent Adjustable Weir Slide Gates	-	-	492.4	128.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	621.3
Skinner Filtration Plant - Landfill	629.3	392.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,021.4
Skinner Filtration Plant - Module 1-3, Electrical Conduit & Wireways Replacement	228.9	92.8	99.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	421.2
Skinner Filtration Plant - Modules 4, 5, & 6 Sedimentation Basins	1,623.3	10,050.8	20,107.0	3,520.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35,301.4
Warehouse & Storage Building at Mills Filtration Plant	237.9	1,045.8	1,883.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,167.6
Water Quality - Demonstration-Scale Testing	2,362.7	4,159.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,522.4
Water Quality Laboratory Expansion	567.9	3,013.6	9,790.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,371.9
Weymouth Filtration Plant - Miscellaneous Site Improvements	2,315.3	-	141.3	815.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,272.0
Weymouth, Diemer, & Skinner Filtration Plants - Ferric Chloride Retrofit	1,058.4	2,520.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,578.6
Total Water Quality/Treatment (Existing Plants)	123,315.1	109,940.8	131,893.0	123,437.4	94,707.2	79,264.0	56,102.9	40,912.2	12.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	759,585.1
Central Pool Augmentation Filtration Plant - Site Acquisition	13,038.8	20,591.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33,629.9
Central Pool Augmentation Filtration Plant	-	-	-	-	-	-	7,137.7	11,537.1	8,693.8	31,885.5	46,645.0	48,979.2	50,606.4	10,208.2	-	-	-	-	-	-	-	-	-	-	-	-	215,692.8
Central Pool Augmentation Filtration Plant Expansion 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,750.1	14,175.1	14,883.9	117,210.6	123,071.2	129,224.6	-	-	-	-	-	-	405,315.5
Total Central Pool Augmentation (Filtration Projects)	13,596.8	20,591.1	-	-	-	-	7,137.7	11,537.1	8,693.8	31,885.5	46,645.0	48,979.2	50,606.4	10,208.2	6,750.1	14,175.1	14,883.9	117,210.6	123,071.2	129,224.6	-	-	-	-	-	-	655,196.2
Perris/San Jacinto Area Study	-	303.2	165.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	468.7
Perris Filtration Plant	-	-	-	-	-	-	-	1,141.2	1,198.3	5,032.8	5,284.4	41,614.6	43,695.4	45,880.1	-	-	-	-	-	-	-	-	-	-	-	-	143,846.7
Perris Filtration Plant Expansion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,927.3	6,147.3	6,454.7	50,830.6	53,372.1	56,040.7	-	-	175,772.8
Total Perris Filtration Plant	19,894.9	303.2	165.5	-	-	-	-	1,141.2	1,198.3	5,032.8	5,284.4	41,614.6	43,695.4	45,880.1	-	-	-	-	2,927.3	6,147.3	6,454.7	50,830.6	53,372.1	56,040.7	-	-	339,983.1
SUBTOTAL FOR FILTRATION PROJECTS	156,806.7	130,835.1	132,058.6	123,437.4	94,707.2	79,264.0	63,240.6	53,590.5	9,904.5	36,918.3	51,929.4	90,593.8	94,301.8	56,088.3	6,750.1	14,175.1	14,883.9	117,210.6	125,998.5	135,372.0	6,454.7	50,830.6	53,372.1	56,040.7	-	-	1,754,764.5
TOTAL CIP (FOR NEXUS STUDY)	522,366.4	752,167.1	866,419.1	936,682.1	571,067.3	199,881.5	148,109.6	152,732.1	115,252.2	235,284.6	245,037.9	302,785.7	323,352.6	153,677.2	96,198.0	92,926.3	90,362.3	196,188.3	207,274.9	220,511.7	95,662.7	147,379.5	145,517.8	152,793.7	101,590.6	106,670.2	7,177,891.6

the new demand charge, because they are required whether or not any additional demands are met from the Metropolitan system.

Water quality and treatment projects are excluded since these costs are included in Metropolitan's treatment surcharge. However, allocation of these projects are shown in Appendix B to help Metropolitan and its member agencies determine whether the costs of additional treatment facilities warrant a separate charge.

Costs of projects that rehabilitate existing facilities and increase the ability to service new demands were allocated using flow capacity. For example, due to more stringent water quality regulations, the amount of water flow that can be processed by the Jensen Filtration Plant decreased to 540 cubic feet per second (cfs). However, existing peak demands are 850 cfs. Expansion No. 1 will add 620 cfs of capacity, with half of that expansion (310 cfs) allowing the plant to meet existing demands and half for future demands.

The allocation between existing demand and new demand is shown in Table 3-2. That portion of the project costs found to service new demands is allocated to the new demand charge. Table 3-3 shows these costs by year for each project.

Project Descriptions

The remaining, major projects in the CIP are described below.

Treated Water Distribution Projects

The following project extends the treated water distribution system.

Allen-McColloch Pipeline Purchase

The Allen-McColloch Pipeline is a treated water line constructed by Municipal Water District of Orange County that is being purchased by Metropolitan as an extension of regional water delivery capacity to consumers in Orange County. Allocation of this project is 100 percent for existing demand because the line currently conveys Metropolitan water to existing demand.

CPA Interim Flow Augmentation Project

This project constructs a pump station at the Diemer Filtration Plant to increase the flow delivery capacity of the Allen-McColloch Pipeline from 416 cfs to 556 cfs. Allocation of this project is 100 percent for new demand because the project would add capacity beyond the current capacity.

South (Orange) County Pipeline—Joint Participation & Purchase

This project is a treated water line constructed by Santa Margarita Water District that is being purchased by Metropolitan as an extension of regional water delivery capacity to consumers in Orange County. Allocation of this project is 100 percent

Table 3-2

Planning and Resources Division
Cost Allocation Summary
(Based on Optimal Case 10/94)
Without Contingencies

DISTRIBUTION AND STORAGE PROJECTS	Existing Demand	New Demand
Total Reliability/Rehab./Admin. Service	**100%**	**0%**
Allen-McColloch Pipeline Purchase	100%	0%
CPA Interim Flow Augmentation Project	100%	0%
South (Orange) County Pipeline - Joint Participation & Purchase	100%	0%
Treated Water Distribution	**100%**	**0%**
Domenigoni Valley Reservoir	62%	38%
Total Domenigoni Reservoir	**62%**	**38%**
Inland Feeder	49%	51%
Total Inland Feeder	**49%**	**51%**
San Diego Pipeline No. 6	19%	81%
Total San Diego Pipeline No.6	**19%**	**81%**
West Valley Area Study	27%	73%
West Valley Project	27%	73%
Total West Valley	**27%**	**73%**
Central Pool Augmentation Tunnel & Pipeline	17%	83%
Total Central Pool Augmentation (Distribution and Storage Projects)	**17%**	**83%**
Chino Basin Groundwater Storage Program	67%	33%
North Las Posas Basin Groundwater Storage Program	67%	33%
Pasadena Groundwater Storage Program	67%	33%
Additional Groundwater	67%	33%
Foothill Area Study	67%	33%
Total Conjunctive Use / GW Storage	**67%**	**33%**
Desalination Demonstration Project	49%	51%
Total Desalination	**49%**	**51%**
Weymouth/Lake Mathews Area Study	0%	100%
Total Foothill and Weymouth	**0%**	**100%**
TOTAL FOR DISTRIBUTION AND STORAGE PROJECTS	**67%**	**33%**

Table 3-3

New Demand Dollars

(Based on Optimal Case 10/94)
($ Thousands - Escalated)

Contingency Included (Yes = Y No = N)
N

DISTRIBUTION AND STORAGE PROJECTS	New Capacity	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	Total Demand Dollars 94/95 - 19/20
Total Reliability/Rehab./Admin. Service	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allen-McColloch Pipeline Purchase	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CPA Interim Flow Augmentation Project	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South (Orange) County Pipeline - Joint Participation & Purchase	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Treated Water Distribution	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Domenigoni Valley Reservoir	38.0%	80,249.4	137,168.6	134,265.3	125,725.2	57,176.3	4,900.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	539,484.9
Total Domenigoni Reservoir	38.0%	80,249.4	137,168.6	134,265.3	125,725.2	57,176.3	4,900.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	539,484.9
Inland Feeder	51.0%	17,595.0	67,698.6	117,343.8	130,717.7	76,388.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	409,743.4
Total Inland Feeder	51.0%	17,595.0	67,698.6	117,343.8	130,717.7	76,388.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	409,743.4
San Diego Pipeline No. 6	81.0%	4,912.1	14,044.0	44,985.6	88,852.0	40,819.6	20,872.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	214,485.5
Total San Diego Pipeline No.6	81.0%	4,912.1	14,044.0	44,985.6	88,852.0	40,819.6	20,872.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	214,485.5
West Valley Area Study	73.0%	247.1	86.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	333.2
West Valley Project	73.0%	-	-	-	-	-	-	-	-	-	-	7,918.6	11,365.8	20,504.1	22,790.8	14,658.5	4,543.2	-	-	-	-	-	-	-	-	-	-	81,781.0
Total West Valley	73.0%	247.1	86.1	-	-	-	-	-	-	-	-	7,918.6	11,365.8	20,504.1	22,790.8	14,658.5	4,543.2	-	-	-	-	-	-	-	-	-	-	82,114.3
Central Pool Augmentation Tunnel & Pipeline	83.0%	-	-	-	-	3,107.3	3,329.6	8,249.4	8,290.4	11,089.0	97,982.0	99,094.5	111,352.8	112,719.3	-	-	-	-	-	-	-	-	-	-	-	-	-	455,214.2
Total Central Pool Augmentation	83.0%	-	-	-	-	3,107.3	3,329.6	8,249.4	8,290.4	11,089.0	97,982.0	99,094.5	111,352.8	112,719.3	-	-	-	-	-	-	-	-	-	-	-	-	-	455,214.2
Chino Basin Groundwater Storage Program	33.0%	220.3	2,048.4	2,056.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,325.1
North Las Posas Basin Groundwater Storage Program	33.0%	660.0	9,570.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10,230.0
Pasadena Groundwater Storage Program	33.0%	-	-	-	-	168.5	353.8	371.5	4,388.0	4,607.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,889.2
Additional Groundwater	33.0%	-	-	-	-	6,556.1	6,556.1	6,556.1	6,556.1	6,556.1	6,556.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39,336.6
Foothill Area Study	33.0%	246.9	211.9	187.8	246.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	892.7
Total Conjunctive Use / GW Storage	33.0%	1,127.2	11,830.3	2,244.2	246.2	6,724.6	6,909.9	6,927.6	10,944.1	11,163.5	6,556.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64,673.6
Desalination Demonstration Project	51.0%	1,312.5	4,200.9	7,974.6	353.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,841.1
Total Desalination	51.0%	1,312.5	4,200.9	7,974.6	353.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,841.1
Weymouth/Lake Mathews Area Study	100.0%	625.5	1,440.2	232.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,298.1
Total Foothill and Weymouth	100.0%	625.5	1,440.2	232.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,298.1
TOTAL FOR DISTRIBUTION AND STORAGE PROJECTS	32.9%	106,068.7	236,468.7	307,046.1	345,894.1	184,216.1	36,011.8	15,177.0	19,234.6	22,252.5	104,538.1	107,013.1	122,718.6	133,223.4	22,790.8	14,658.5	4,543.2	-	-	-	-	-	-	-	-	-	-	1,781,855.1

for existing demand because the line currently conveys Metropolitan water to existing demand.

Domenigoni Valley Reservoir

This water supply storage project provides seasonal, drought carryover, and emergency storage. It meets a portion of the water storage needs necessary for Metropolitan to meet its reliability goal. It allows Metropolitan to take water when available from either the State Water Project or the Colorado River Aqueduct and store it for delivery when water are limited by drought or other conditions.

Emergency storage requirements assume imported water systems would be unable to deliver water for six months, but local supplies would continue at full production. Emergency storage is sized to supplement local supplies for six months assuming that water demands are 75 percent of normal water demands.

Carryover storage allows Metropolitan to meet its reliability goal during drought or other periods of water shortage. The storage volume requirement was calculated using statistical analysis of 70 years of hydrologic data. Withdrawals from storage for those hydrologic scenarios were used to determine carryover storage requirements.

Seasonal shift storage allows Metropolitan to meet peak summertime water demands with water from storage. It was calculated as the difference between monthly supply and monthly demand.

To allocate this reservoir project between new and existing demands, Metropolitan first calculated current requirements for emergency, drought carryover, and seasonal storage in the reservoir. This total was then compared to projected storage requirements (including emergency, drought carryover, and seasonal storage) in the year 2020. Dividing current storage requirements (in acre-feet of storage capacity) by year 2020 storage requirements shows the percentage portion allocated to serve new demands.

In equation form, the allocation is as follows:

Current storage requirements = Emergency + Drought Carryover + Seasonal
= 293,000 + 200,000 + 0
Year 2020 storage requirements
= 430,000 + 275,000 + 95,000

A. Allocation to Existing Demand
= (Current Storage Requirements) ÷ (Year 2020 Storage Requirements)
= 493,000 ÷ 800,000
= 62 percent

B. Allocation to New Demand = 38 percent

Inland Feeder

This water supply project delivers water from the east branch of the State Water Project to the Colorado River Aqueduct or Domenigoni Valley Reservoir. It will allow Metropolitan to take delivery of excess State Water Project water when it is available and store it in Domenigoni Valley Reservoir and other areas.

To allocate this feeder project between new and existing demands, Metropolitan first calculated expected annual supply requirements. The current supply needs were compared to the future supply needs. Dividing existing supply requirements (in acre-feet per year) by year 2020 supply requirements shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Existing supply requirements = 680,000 acre-feet
Year 2020 supply requirements = 1,390,000 acre-feet

A. Allocation to Existing Demand

= (Existing Requirements) ÷ (Year 2020 Requirements)
= 680,000 ÷ 1,390,000
= 49 percent

B. Allocation to New Demand = 51 percent

San Diego Pipeline No. 6

This pipeline constructs a new pipeline to increase flows from Metropolitan to San Diego County.

To allocate this feeder project between new and existing demands, Metropolitan first calculated expected annual delivery requirements. This requirement was then compared to actual delivery capacity. The amount of delivery capacity available beyond the delivery needs is available to improve the service reliability. Dividing the reliability capacity (in acre-feet per year) by the delivery capacity shows the percentage portion allocated to serve existing demands.

In equation form, the allocation is as follows:

Maximum annual delivery capacity = 360,000 acre-feet
Expected average annual deliveries = 290,000 acre-feet
Available annual reliability capacity for existing demand
= Delivery Capacity - Expected Deliveries
= (360,000 - 290,000) = 70,000 acre-feet

A. Allocation to Existing Demand
= (Reliability Capacity) ÷ (Delivery Capacity)
= (70,000) ÷ (360,000)
= 19 percent

B. Allocation to New Demand = 81 percent

West Valley Project

This project installs a new pipeline to increase flows from Metropolitan to western Los Angeles and southern Ventura counties.

To allocate this feeder project between new and existing demands, Metropolitan first calculated expected annual delivery requirements. This requirement was then compared to actual delivery capacity. The amount of delivery capacity available beyond the delivery needs is available to improve the service reliability. Dividing the reliability capacity (in acre-feet per year) by the delivery capacity shows the percentage portion allocated to serve existing demands.

In equation form, the allocation is as follows:

Maximum annual delivery capacity = 220,000 acre-feet
Expected average annual deliveries = 160,000 acre-feet per year
Available reliability capacity for existing demand
= Delivery Capacity - Expected Deliveries
= (220,000 - 160,000) = 60,000 acre-feet per year

A. Allocation to Existing Demand
= (Reliability Capacity) ÷ (Delivery Capacity)
= (60,000) ÷ (220,000)
= 27 percent

B. Allocation to New Demand = 73 percent

Central Pool Augmentation (Distribution and Storage Projects)

These projects install a new pipeline and tunnels to increase the flows from Metropolitan to the eastern portion of Metropolitan's Central Pool service area in Orange and western Riverside counties.

Central Pool Augmentation Tunnel and Pipeline

This project installs a new pipeline and tunnel to convey water from the Central Pool Augmentation Filtration Plant.

To allocate this feeder project between new and existing demands, Metropolitan first calculated expected annual delivery requirements. This requirement was then compared to actual delivery capacity. The amount of delivery capacity available beyond the delivery needs is available to improve the service reliability. Dividing the reliability capacity (in acre-feet per year) by the delivery capacity shows the percentage portion allocated to serve existing demands.

In equation form, the allocation is as follows:

Annual delivery capacity = 580,000 acre-feet
Expected annual deliveries = 480,000 acre-feet
Available annual reliability capacity for existing demand
= Delivery Capacity - Expected Deliveries
= (580,000 - 480,000) = 100,000 acre-feet

A. Allocation to Existing Demand
= (Reliability Capacity) ÷ (Delivery Capacity)
= (100,000) ÷ (580,000)
= 17 percent

B. Allocation to New Demand = 83 percent

Groundwater Storage

The following projects construct wells, spreading basins, and other facilities to provide groundwater storage to help meet the water delivery reliability goals of Metropolitan during droughts or other periods of water supply shortage.

Chino Basin Groundwater Storage Program

This groundwater storage project is located in San Bernardino County.

To allocate this conjunctive use project between new and existing demands, Metropolitan first calculated its current requirements for drought carryover storage. This total was then compared to projected drought carryover storage requirements in the year 2020. Dividing current storage requirements (in acre-feet of storage capacity) by year 2020 storage requirements shows the percentage portion allocated to serve new demands.

In equation form, the allocation is as follows:

Existing carryover storage requirements = 200,000 acre-feet
Year 2020 carryover storage requirements = 300,000 acre-feet

A. Allocation to Existing Demand
= (Existing Carryover Storage Requirements) ÷ (Year 2020 Carryover Storage Requirements)
= 200,000 ÷ 300,000
= 67 percent

B. Allocation to New Demand = 33 percent

North Las Posas Basin Groundwater Storage Program

This project will develop facilities to store water in the North Las Posas Groundwater Basin in Ventura County. Allocation of this project, as all groundwater storage projects, is 67 percent to existing demand and 33 percent to new demand.

Pasadena Groundwater Storage Program

This project will develop facilities to store water in the Raymond Groundwater Basin in Los Angeles County. Allocation of this project, as all groundwater storage projects, is 67 percent to existing demand and 33 percent to new demand.

Additional Groundwater

This project(s) will develop facilities to store water in groundwater basins for the benefit of Metropolitan. Allocation of this project, as all groundwater storage projects, is 67 percent to existing demand and 33 percent to new demand.

Foothill and Weymouth Area Studies

These projects examine needs for facilities in their respective area.

Foothill Area Study

This project evaluates water deliveries for conjunctive groundwater storage in northern Los Angeles County.

Allocation of this project, as all groundwater storage projects, is 67 percent to existing demand and 33 percent to new demand.

Weymouth/Lake Mathews Area Study

This project evaluates raw water delivery and filtration needs in eastern Los Angeles and western San Bernardino counties.

Allocation of this project is 100 percent to new demand.

Desalination Demonstration Project

This project designs and constructs a state-of-the-art 5 million gallon per day seawater desalination demonstration plant to provide a proven design and operating history to undertake a full-scale 50/100 million gallon per day seawater desalination project.

To allocate this project between new and existing demands, Metropolitan first calculated expected annual supply requirements. The current supply needs were compared to the future supply needs. Dividing existing supply requirements (in acre-feet per year) by year 2020 supply requirements shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Existing supply requirements = 680,000 acre-feet
Year 2020 supply requirements = 1,390,000 acre-feet

A. Allocation to Existing Demand

= (Existing Requirements) ÷ (Year 2020 Requirements)
= 680,000 ÷ 1,390,000
= 49 percent

B. Allocation to New Demand = 51 percent

Section 4
New Demand Charge

The new demand charge is calculated using water sales above a historic base. As explained in Section 2, the base amount is the higher of the readiness-to-serve base, the three-year average or the four-year average of sales to each member agency.

Each fiscal year, the average of each member agency's most recent four years of water purchases from Metropolitan will be compared to its base. To reflect normal demands on Metropolitan, each year's sales will be adjusted for sales for long-term storage purposes as follows:

- Water taken under one-time drought storage agreements (OTDS) will be excluded during the year of delivery
- Water taken under the Cooperative Storage Program (COOP) will be excluded through April 12, 1994.
- Water taken under long-term seasonal storage service (LTSSS), cyclic storage, and the 1993 Demonstration Storage Program (DEMO) will be subtracted from the water sales calculations through fiscal year 1993-94.
- Contractual LTSSS and COOP (starting April 13, 1994) deliveries will be excluded from the new demand charge calculation during the year of delivery but will be included in the year of use.

Water taken under these storage programs will be included in the water sales in the year in which the water is used.

The calculation of four-year average for fiscal year 1995-96 in equation form is as follows:

	FY 1992-93 Sales - (LTSSS allocated to May and June 1993) - OTDS - COOP - DEMO
+	FY 1993-94 Sales - (LTSSS allocated to July, August, and September 1993 and May and June 1994) - OTDS - COOP - DEMO
+	FY 1994-95 Sales - contractual LTSSS
+	FY 1995-96 Sales - contractual LTSSS
=	Subtotal of Adjusted Water Sales
÷	4
=	Four-year average adjusted water sales

This four-year average will roll each year (a new year's sales are added and the oldest year's sales are subtracted when the annual charge is calculated). A rolling average has been selected to even out highs and lows resulting from climatic, hydrologic, economic, and other factors in each year and to be consistent between measuring the base demand and new, permanent demand. An average also avoids penalizing a given agency for a single year's excursion above the basic normal demands.

The adjusted rolling four-year average will be compared to the base amount and the volume of water above the base amount will result in an one-time new demand charge. When a member agency exceeds its base amount, the new rolling four-year average will become its base amount, allowing water use to vary within that new base amount without any additional charges.

As an example, the water sales of two hypothetical member agencies are shown in Figures 4-1 and 4-2. Although both agencies purchase water beyond their base amount in several years, the new demand charge is incurred only when the rolling average exceeds the base amount. In the growing agency example, Figure 4-1, the water sales exceeds the base amount by 1,800 acre-feet in year 1, but the rolling average demand exceeds the base amount by only 450 acre-feet. As a result, the base amount increases from 100,000 acre-feet to 100,450 acre-feet and a new demand charge of 450 acre-feet is incurred.

In the non-growing agency example, Figure 4-2, the water sales exceeds the base amount by 3,950 acre-feet in year 2, but the rolling average demand remains less than the base amount. As a result, the base amount remains at 100,000 acre-feet and no new demand charge is incurred.

The amount of the unit new demand charge (per acre-foot of new demand) will be determined annually by Metropolitan's Board of Directors, up to a maximum amount equal to the present value of the projected costs of distribution and storage facilities to meet future demands (Columns 1, 2, and 3 on Table 4-1) divided by the projected quantity (in acre feet) of new demands. Column 1 on Table 4-1 repeats the projected annual expenditures in each year through fiscal year 2019-20 for capital facilities for new demands listed on Table 3-3. The present value of these amounts is calculated using the most recent five-year average of the 30-year treasury bond rate (7.97 percent) as a discount factor. The present value of these annual payments totals $ 1.28 billion and represents the amount of money Metropolitan estimates it would have to invest in 1994 to pay for the distribution and storage facilities required to meet the new demand.

Through purchases of water supplied by Metropolitan, new users will pay a portion of the costs of financing Metropolitan's capital facilities (including facilities to serve new demand) because some capital costs are paid with revenue (PAYGO) and some debt service costs are included in the basic water rate. To avoid double payment by these users of the same capital costs, the present value of annual expenditures for facilities for new demand, $ 1.28 billion, must be offset by a credit equal to the present value of the new users' share of capital costs (PAYGO and debt service) included in the water rate. To determine these amounts, Metropolitan's projected average water rates (Column 6) are calculated for the planning period. (The average

Figure 4-1
Demand Charge Analysis
Growing Agency Example

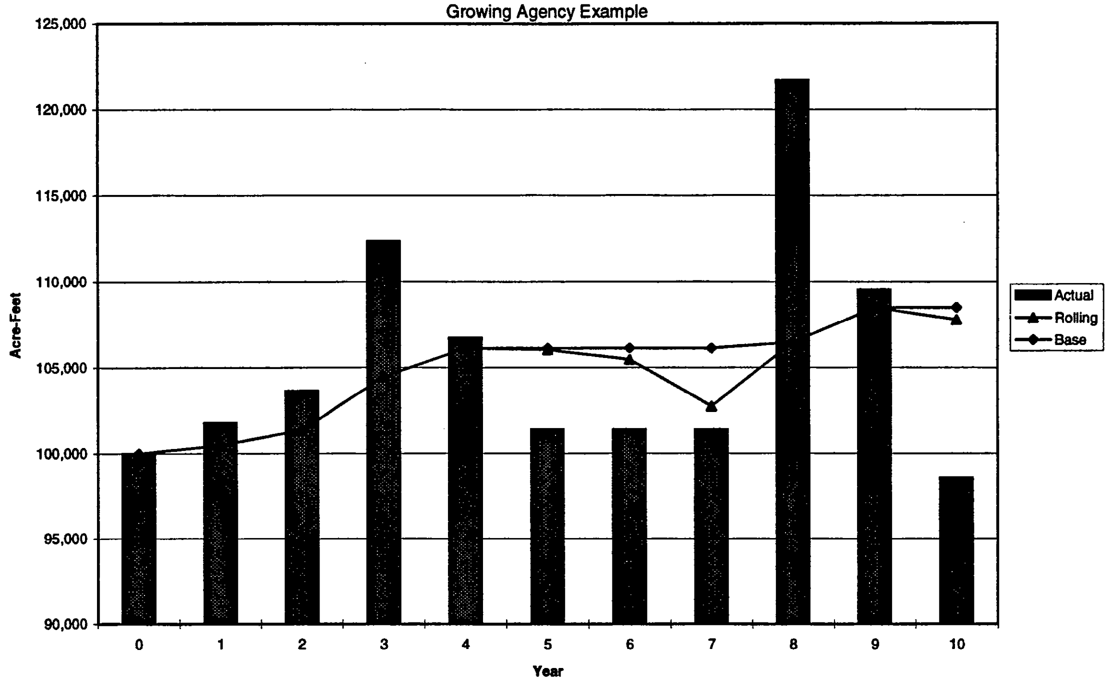
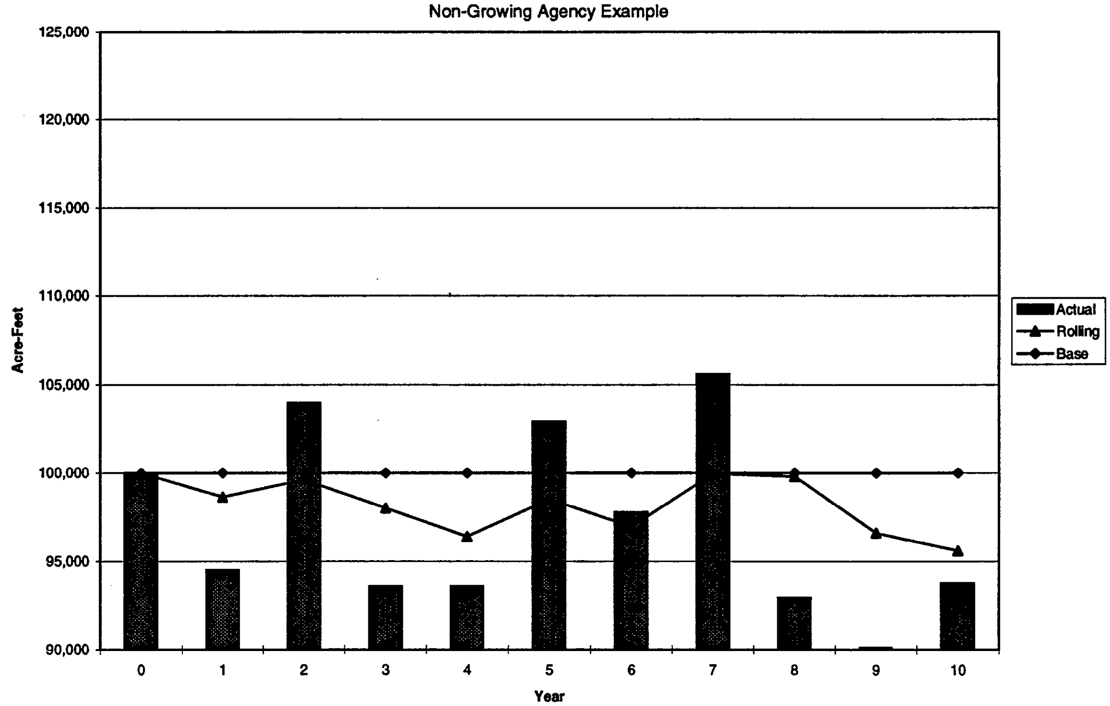


Figure 4-2
Demand Charge Analysis
Non-Growing Agency Example



New Demand Charge
Unit Charge Calculation

Table 4-1

Fiscal Year Ending	(1) CIP Costs For Future Users ($1,000's)	(2) Present Value Factor 7.97%	(3) Present Value of (1) ($1,000's)	(4) PAYGO attributed to Future Users ($1,000's)	(5) Present Value of (4) ($1,000's)	(6) Average Commodity Rate ($/af)	(7) Portion of Average Rate Attributed to Future User Debt Service ($/af)	(8) New Demand Above Initial Base (AF)	(9) Water Sales Revenue Allocated to Future User Debt Service ($1,000's)	(10) Present Value of (9) ($1,000's)	(11) Unit NDC ($/af)
1995	$106,669	1.0000	$106,669	$832	$832	$303	$0	17,721	$0	$0	$0
1996	$237,469	0.9262	$219,944	$1,052	$974	$307	$2	25,545	$44	41	$1,000
1997	$307,046	0.8578	$263,384	$1,328	$1,140	$308	$7	34,203	$237	203	$1,124
1998	$345,894	0.7945	$274,813	$2,683	$2,132	$308	$12	71,622	$883	701	$1,248
1999	$184,216	0.7358	$135,546	$4,253	$3,130	$313	$17	113,599	$1,935	1,424	$1,372
2000	$36,012	0.6815	$24,542	$2,689	$1,833	$326	$20	155,794	$3,183	2,169	$1,496
2001	$15,177	0.6312	$9,580	$2,729	$1,722	$339	$22	206,496	$4,641	2,929	$1,621
2002	$19,235	0.5846	$11,245	$3,151	$1,842	$345	$24	222,157	$5,399	3,156	$1,669
2003	$22,253	0.5415	$12,050	$2,670	$1,446	$348	$25	246,314	$6,242	3,380	$1,719
2004	$104,538	0.5015	$52,426	$5,813	$2,915	$348	$26	270,829	$7,085	3,553	$1,771
2005	$107,013	0.4645	$49,708	$7,704	$3,578	$348	$27	350,203	$9,489	4,408	$1,824
2006	$122,719	0.4302	$52,794	$7,650	$3,291	$348	$28	291,884	$8,167	3,513	$1,879
2007	$133,223	0.3984	$53,076	$8,564	$3,412	$348	$29	313,688	$9,116	3,632	$1,935
2008	$22,791	0.3690	$8,410	$4,574	$1,688	$348	$30	342,526	$10,413	3,843	$1,993
2009	$14,659	0.3418	$5,010	$3,078	$1,052	$348	$31	371,045	$11,345	3,878	$2,053
2010	$4,543	0.3166	$1,438	$3,390	$1,073	$348	$30	445,490	$13,183	4,174	$2,114
2011	$0	0.2932	$0	$0	$0	$355	$31	519,519	$16,309	4,782	$2,178
2012	$0	0.2715	$0	$0	$0	$362	$33	517,917	$17,247	4,683	$2,243
2013	$0	0.2515	$0	$0	$0	$369	$35	520,210	$18,377	4,622	$2,310
2014	$0	0.2329	$0	$0	$0	$376	$37	536,181	$20,093	4,680	$2,380
2015	$0	0.2157	$0	$0	$0	$384	$40	556,411	$22,118	4,771	$2,451
2016	$0	0.1998	$0	$0	$0	$392	$42	585,105	$24,673	4,930	$2,525
2017	$0	0.1851	$0	$0	$0	$399	$45	617,244	$27,611	5,111	$2,600
2018	$0	0.1714	$0	$0	$0	$407	$47	648,684	$30,782	5,276	$2,678
2019	$0	0.1588	$0	$0	$0	$416	$50	679,899	$34,224	5,435	$2,759
2020	$0	0.1470	$0	$0	$0	$424	$53	714,391	$38,147	5,608	$2,842
			$1,280,634		$32,059					$90,900	

Present Value Net CIP Costs For Future Users		Present Value PAYGO attributed to Future Users		Present Value Water Sales Revenue Allocated to Future User Debt Service				New Capacity for Future Demands		New Demand Charge
$1,280,634	- (	$32,059	+	$90,900)	=	$1,157,675	/	714,391	=	$1,621 /af

water rate, and hence the unit new demand charge, is sensitive to assumptions about CIP financing and timing.)

Metropolitan currently pays for twenty percent of annual capital expenditures with water sales revenue through its pay-as-you-go (PAYGO) fund. In the future, as new demand begins purchasing water, a portion of the PAYGO fund will be provided by the new demand. The portion of the PAYGO funds attributable to new demand is the ratio of water sales revenue attributed to the water sales beyond the base amount. It is determined by multiplying the average commodity rate (Column 6) and the projected annual acre-feet of new demand water sales (Column 8). The product is in column 4. Column 5 shows the present value of Column 4, determined using the discount factor shown in Column 2. The present value of the total PAYGO capital credit to the new demand charges totals $32 million.

A separate calculation is used to determine the portion of the water sales revenue used to service debt. The new demand capital portion included in the water rate (Column 7) is determined based on the proportion of the new demand debt service to the total water revenue requirement each year. The new demand capital portion of the water rate is multiplied by the projected annual acre-feet of new demand water sales (Column 8) to determine the annual new demand capital contribution (Column 9). Column 10 shows the present value of Column 9, determined using the discount factor shown in Column 2. The present value of the total capital credit to the new demand charges totals $91 million.

The present value of the projected facilities cost is reduced by the present value of the credit for PAYGO and future capital contributions, for a revised present value cost of $ 1.16 billion. This new cost is divided by the amount of projected new system capacity to be provided to serve new demands by the future facilities, measured in acre-feet per year (see Table 2-4). New capacity in the year 2020 is estimated to be 714,391 acre-feet per year. As a result, the present value cost of providing new facilities necessary for projected new demands is projected to equal $1,621 per acre-foot. This is the amount determined to represent the reasonable cost (per acre-foot of projected new demands) of facilities necessary to serve new demands.

The new demand charge will be implemented in fiscal year 1995-96. For the first four years, this charge is projected to be set lower than the total present value cost of new facilities to service new demands to minimize the financial impact and allow the member agencies time to adjust to the new charge, and to allow for changes in the Capital Improvement Program and the demand projections. The initial new demand charge is expected to be $1,000 per acre-foot of new demand. The actual new demand charge is expected to increase over five years toward the then-current unit new demand charge calculated as shown on Table 4-1 and explained above.

Table 4-2 shows the projected new demand charges for each member agency, in escalated dollars. For some member agencies, the demand for Metropolitan water

Table 4-2

Projected New Demand Charge Revenue

Member Agency	Projected Metropolitan Revenue (dollars)
City of Anaheim	19,500,000
City of Beverly Hills	4,100,000
City of Burbank	4,600,000
Calleguas MWD	48,600,000
Central Basin MWD	0
Chino Basin MWD	53,900,000
Coastal MWD	12,200,000
City of Compton	0
Eastern MWD	135,100,000
Foothill MWD	5,700,000
City of Fullerton	0
City of Glendale	0
Las Virgenes MWD	18,900,000
City of Long Beach	0
City of Los Angeles	0
MWD of Orange County	65,100,000
City of Pasadena	2,300,000
San Diego County Water Authority	413,600,000
City of San Fernando	500,000
City of San Marino	0
City of Santa Ana	8,100,000
City of Santa Monica	800,000
Three Valleys MWD	42,700,000
City of Torrance	0
Upper San Gabriel Valley MWD	10,200,000
West Basin MWD	0
Western MWD of Riverside County	294,100,000
Total	1,140,000,000

will peak before year 2020, resulting in new demand charges even though their year 2020 demands may not exceed their new demand base amount.

The actual unit new demand charge will be calculated and reviewed annually to reflect any changes in the capital projects and programs designed to accommodate new demands, and will be established each year by the Board, based on these calculations. Once incurred by a member agency, the new demand charge may be collected over a 15-year period, which corresponds to the average weighted life of Metropolitan's outstanding long-term debt. The amount collected each year will be adjusted to include carrying costs calculated at Metropolitan's weighted average cost of capital. Over the past decade, those costs have ranged between 5.58 and 5.83 percent.

Appendix A
Implementation Approach

The purpose of this appendix is to illustrate two different approaches member agencies and subagencies might utilize to implement capacity charges (depending upon the particular agency these may be termed connection fees, impact fees, development fees, etc) at the local level to collect revenues from new connections (users) to pay new demand charges to Metropolitan. This appendix applies only to those agencies that desire to collect part or all of their potential new demand charge obligations to Metropolitan from new users. It is recognized that certain agencies may opt to pay new demand charges with water rate revenues. Furthermore it is also recognized that not all of an agency's new demand charge obligations may be attributable to new users.

The first approach to charge new users is to use the relationship between new demand and the requirements of new users as established in the Nexus study and directly implement a charge. This is termed "Direct Implementation." The second approach is to incorporate estimated payments to Metropolitan under the new demand charges as just another cost element in the development of local capacity charges. This approach is termed "Indirect Implementation."

Direct Implementation Approach

The simplest approach for member agencies and/or subagencies would be to directly implement a capacity charge on new users based on the results of this Nexus Study. The study found that the allocated cost of facilities necessary to serve new demands through the year 2020 is $1,621 per acre-foot of new demand. It is planned that initial implementation of the charge by Metropolitan will be at $1,000 per acre-foot. Many water agencies perform a similar calculation as presented in the Nexus Study to establish capacity charges for their agency. They could simply add Metropolitan's charge to their charge or levy it directly as an additional, separately identified charge.

Each member agency or subagency has available to it data on the average annual water usage in its service area for different types of users. A common finding is that a typical residential user served through a 3/4-inch water meter uses about 0.5 acre-feet of water a year. If so, then a capacity charge based upon the new demand charge Nexus Study would be $500 per new 3/4-inch meter assuming the agency planned to have Metropolitan supply all additional future demands. For new customers with larger size meters, the agency could use a meter capacity ratio to set the capacity charge or base it on experienced average annual demands by current customers having larger meters. For example, according to American Water Works Association standards, a 2-inch meter can deliver approximately 5.3 times as much water as a 3/4-inch meter. Thus, the capacity charge for a 2-inch meter could be set at $2,650 to proportionately recover its cost. However, because the meters may be oversized to provide fire-fighting flows, an agency's data may indicate that customers with a 2-inch meter only use about 2.5 acre-feet of water per year. An appropriate capacity charge then would be $2,500.

Another approach commonly employed is to use an equivalent dwelling or residential unit ratio (EDU or RDU). Again, if a typical dwelling unit in an agency's jurisdiction uses 0.5 acre-feet of water per year, then the charge would be set at $500 per EDU, again assuming all new demands will be met from Metropolitan. Each commercial or other type of customer added to the system would be charged on their assigned EDUs. However, unlike meter capacity, there is no set standard for determining the EDUs of different types of customers and agencies use a variety of methods to determine EDUs.

Agencies that plan to use water sources such as local supplies, conservation, or reclamation to meet a portion of their future demands in their service area must reduce the per unit demand to only that portion which Metropolitan will supply before calculating the capacity charge. Thus, if only one-half of all future demands in a particular agency's service area are to be met from Metropolitan, then the per unit demand would be reduced to 0.25 acre-feet (assuming 0.5 acre-feet per year per unit) and the capacity charge would be $250.

Indirect Implementation Method

Under the indirect implementation method, a member agency would need to develop estimates of the new demand charge it expects to incur during some appropriate study period. The study period should match the period the agency used to establish its own capacity charges. Thus, if an agency based its calculation of capacity charges on its capital improvement program to the year 2010, then an estimate should be made of the new demand charges payable to Metropolitan through the same year. Those payments can be considered a capital outlay for the acquisition and delivery of water supply to the agency since the Nexus Study clearly identifies that the new demand charge represents payment for capital costs of facilities to serve new demand.

To further illustrate this approach, if the agency planned to expend $3,000,000 on its own facilities to serve 3,000 new customers between now and 2010, then it would have a capacity charge of $1,000 per new customer. This could be expressed per equivalent meter or EDU depending upon the agency's approach to setting such charges. If each new customer uses 0.5 acre-feet of water per year, then that agency will incur $1,500,000 in new demand charges to Metropolitan. Its total capital outlay for construction of its facilities plus its share of Metropolitan's facilities will be $4,500,000. That would then raise the calculated capacity charge to $1,500 per new customer. Note that the increase in the charge is the same as the amount of the charge calculated under the direct method.

A further refinement which must be made when using this approach is to separate the estimated new demand charge between growth and increases from existing users. Again, using the above example, if existing users also increase their demands and cause the estimated total new demand charge to be $2,000,000 instead of $1,500,000 then the agency must reduce the amount of new demand charges by 25 percent before calculating capacity charges applicable to new users. The remaining $500,000 in new demand charges will need to be recovered from existing users through water rates or other appropriate mechanisms.

The indirect method may require more work than the direct implementation method, however, it is likely to be more consistent with the various approaches used by member agencies to establish capacity charges in their service areas. Member agencies which do not presently have capacity charges would need to establish such charges for this method to work. Such charges could be based solely on the agency's anticipated new demand charge obligations.

Member agencies which do not have capacity charges but which do have subagencies with capacity charges would need to develop a mechanism similar to Metropolitan's new demand charge in order to pass costs through to its subagencies and enable them to develop their own capacity charges under this approach. It is important for member agencies which have subagencies to determine whether it or its subagencies will actually levy the charge so that new users do not pay more than once for new Metropolitan capacity.

Figure A-1 shows how this Nexus Study provides the necessary information to member agencies or subagencies to develop their own nexus to implement capacity charges under the methods discussed above. This Nexus Study includes development of new demand projects, an identification of new facilities to serve that new demand, and a resulting unit cost applicable to each unit of new demand. Each agency or subagency must then take the capacity charge on new development. Under Section 66000-66009 of the Government Code each local agency imposing a charge on new development must meet certain specified criteria, including establishment of a local nexus between the need for facilities and their costs to new development. Therefore, each member agency and/or subagency must use its own demand projections, customer growth data, and average use per customer with the unit cost data from this Nexus Study to establish local capacity charges.

Exhibit A-1 presents an example draft resolution or ordinance complete with example calculations for implementing local capacity charges based on this Nexus Study. The example calculations relate to both the direct and indirect methods. Each local agency or subagency must add information regarding its specific authority to levy capacity charges and its procedures for setting and collecting the charges, depositing of funds collected, and other matters in accordance with the appropriate Government Code sections.

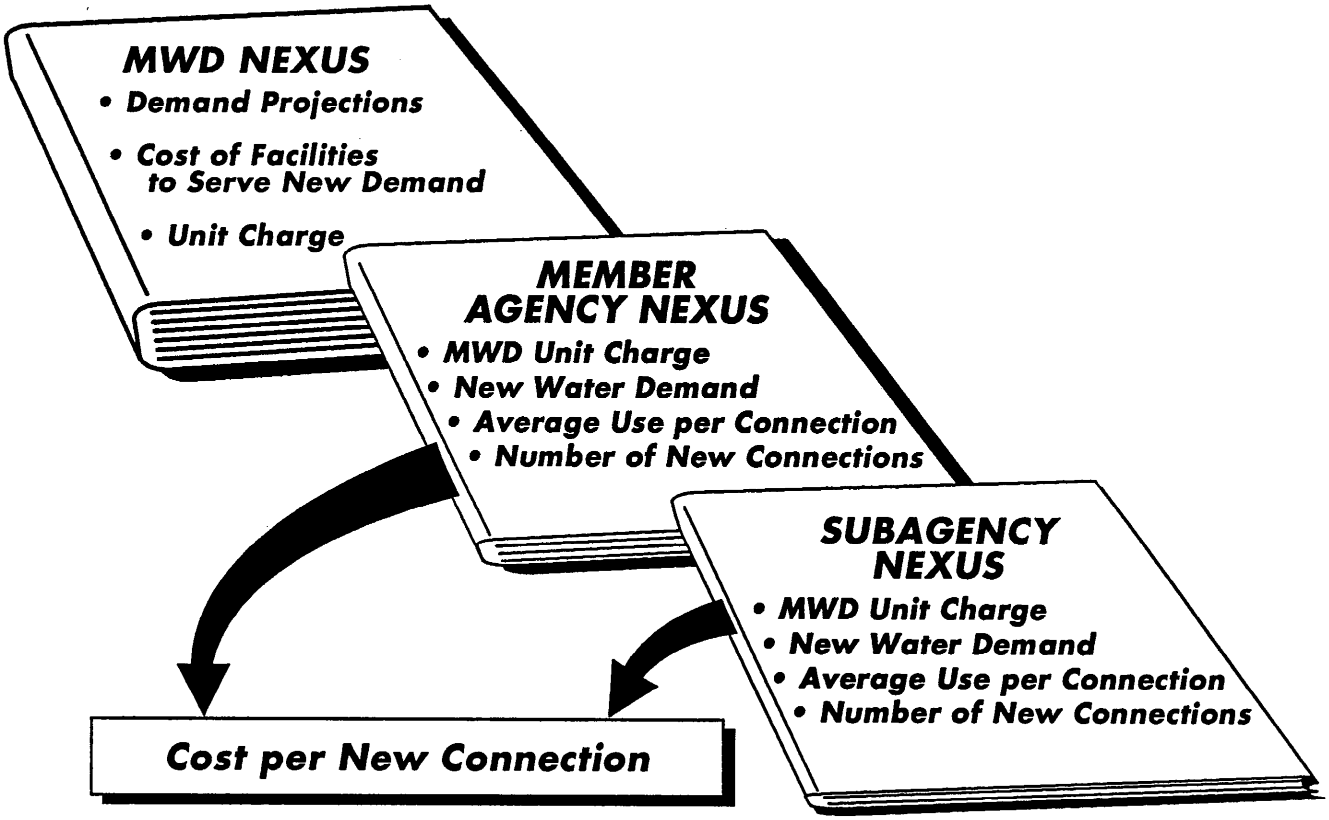

MWD NEXUS
• Demand Projections
• Cost of Facilities to Serve New Demand
• Unit Charge
MEMBER AGENCY NEXUS
• MWD Unit Charge
• New Water Demand
• Average Use per Connection
• Number of New Connections
SUBAGENCY NEXUS
• MWD Unit Charge
• New Water Demand
• Average Use per Connection
• Number of New Connections
Cost per New Connection

Figure A-1

EXHIBIT A-1

[ORDINANCE] [RESOLUTION] OF THE ____________________
[Governing Body]
OF ________________
IMPOSING CAPACITY CHARGE[1]

WHEREAS, ...

[RECITALS SHOULD ADDRESS the agency's authority for imposition of the charge, procedures followed for notice of imposition of charge and public hearing, consideration of environmental effects and CEQA action or exemption, etc., and findings concerning the charge.

Specific findings about the charge to be adopted, which are required under AB 1600 (Government Code sections §66000 et seq.) should include substantially the following:]

WHEREAS, the purpose of such capacity charge is to provide for payment of the new demand charge imposed by The Metropolitan Water District of Southern California anticipated to be incurred by [AGENCY];

WHEREAS, the "Nexus Study in Support of Metropolitan's New Demand Charge" dated ___________, 199_, shows the capital facilities to be provided with proceeds of the new demand charge and the estimated costs of those facilities;

WHEREAS, such capital facilities are being provided so that Metropolitan may provide water service for anticipated new demands in its service area;

WHEREAS, [AGENCY] obtains [finding regarding amount of water to be obtained from Metropolitan] of its water from Metropolitan, and the projects and persons to be subject to the capacity charge imposed hereby will use water, and thus will increase [AGENCY]'s demands on Metropolitan;

WHEREAS, the capacity charge imposed hereby is reasonable and necessary to provide for payment of Metropolitan's new demand charge and to provide for the capital facilities to be funded from proceeds of such new demand charge, which capital facilities will benefit the persons and projects required to pay the capacity charge;

---

[1]This draft contains a rough outline and illustrative provisions for a local agency ordinance or resolution imposing a capacity charge. Legal requirements and procedures vary. Consequently, counsel must be consulted on any ordinance or resolution adopted by the local agency.

NOW, THEREFORE, the [Governing Body] of [AGENCY] does hereby [ordain] [resolve, determine and order] as follows:

Section 1. The foregoing recitals are true and correct and constitute legislative findings of this [governing body].

Section 2. That the public interest and necessity require [AGENCY] to impose a capacity charge on each new connector to [AGENCY]'s water system to provide for payment of the new demand charge and fund the capital facilities to be provided by The Metropolitan Water District of Southern California with proceeds of such new demand charge.

Section 3. That the amount of such new demand charge expected to be incurred by [AGENCY], based upon forecasts by [AGENCY] and by Metropolitan, is $ _________ through the end of fiscal year _____.

Section 4. That in order to provide for the payment of such new demand charge, the capacity charge to be paid by each new connector to [AGENCY]'s water system shall be as follows:

[INSERT SCHEDULE OF CHARGES, BY SIZE OF CONNECTION, EDU, ETC.]

Section 5. That the amount of such capacity charge was calculated as provided in Exhibit A attached hereto and incorporated by reference.

Section 6. That, based on the new demand charge to be incurred by [AGENCY] and the cost of facilities to be provided with proceeds of the new demand charge, which facilities will be provided to supply water to the persons and projects to be subject to the capacity charge imposed hereby, the amount of such capacity charge is reasonable in relation to the cost of the public facilities to be funded through such capacity charge.

[INSERT LOCAL AGENCY PROCEDURES FOR COLLECTION OF CAPACITY CHARGE, DEPOSIT AND USE OF FUNDS, ETC.]

EXAMPLE CALCULATIONS
LOCAL AGENCY CONNECTION CHARGE FOR NEW DEVELOPMENT

Direct Implementation Method

Metropolitan New Demand Charge	×	Annual Average Use per Base Unit	×	Percent of Future Water from Metropolitan	=	Local Agency New Connection Charge (a)(b)
$1000 per AC-FT		.55 AC-FT per EDU		100%		$550 per EDU
$1000 per AC-FT		.55 AC-FT per EDU		50%		$275 per EDU
$1000 per AC-FT		.55 AC-FT per ¾" Meter		100%		$550 per ¾" Meter
$1000 per AC-FT		.55 AC-FT per ¾" Meter		50%		$275 per ¾" Meter
$1000 per AC-FT		.5 AC-FT per ERU		20%		$100 per ERU
$1000 per AC-FT		.4 AC-FT per ERU		80%		$320 per ERU
$1000 per AC-FT		.3 AC-FT per ERU		0%		No Charge

(a) For recovery of Metropolitan's new demand charge from a base unit of growth. For new users with additional units or larger meters, the local agency would use its own established method for increasing the base unit charge.

(b) Excludes recovery of new demand charge due to increased usage by existing users.

Indirect Implementation Method

Local Agency Costs to Serve New Development (a)		$3,000,000
Estimated New Demand Charge from Metropolitan (b)	$2,000,000	
Percentage of New Demand from Growth (c)	75%	
New Demand Charge Allocated to New Development	$1,500,000	$1,500,000
Total Cost to Serve New Development		$4,500,000
Estimated New Units (EDUs)		3,000 EDUs
Total Charge per New Unit		$1,500

(a) Total capital cost for facilities necessary to serve new development over a specified period of time, usually 10 years or more.

(b) Total estimated new demand charge from Metropolitan or passed through by a Metropolitan Agency to a subagency during the same period.

(c) Only that portion of new demand charge attributable to new development can be recovered from new development in a connection charge. The remaining new demand charges must be recovered from existing users because they also increased their demands.

Appendix B
Water Quality Projects

The cost of treatment facilities is included in Metropolitan's treatment surcharge. Although this study divides treatment facilities between existing and future demands, they are excluded from the new demand charge. The allocation is presented to demonstrate that the need for these facilities are for both existing and future demands and to help Metropolitan and its member agencies determine whether the costs of additional treatment facilities warrant a separate charge.

The allocation between existing demand and new demand is shown in Table B-1. That portion of the project costs found to service new demands is shown in Table B-2.

Project Descriptions

The following projects rehabilitate existing filtration plants, meet the requirements of various treatment regulations, and/or increase the ability to service new demands.

Metropolitan operates five regional filtration plants. Allocation of these projects is based on flows. Water demands on these treatment plants will generally be higher in the summer and in dry years. Seasonal and dry year peak demands are used for allocating water quality and treatment projects because those projects are sized to meet these peak demands.

Some of the filtration plants cannot purify as much water as they have in the past because of more stringent water quality regulations. These regulations and new demands have required Metropolitan to rehabilitate and expand some of the existing filtration plants. In the following water quality and treatment projects, those projects or portions of projects required to bring the plants back up to its historic peak capacity (before the more stringent water quality regulations became effective) are allocated to existing demands. Projects associated with filtration capacity beyond historic peak demands are allocated to future demands. Historic peak demands on existing plants are utilized rather than plant design capacity because at times historic peak flows have exceeded the designed plant capacity. Using historic peak demands instead of historic average demands results in a smaller percentage of the project's cost being allocated to the new demand charge.

All Facilities - Discharge Elimination

This project identifies discharges from facilities and where economically feasible, eliminates that discharge or where not, obtains permits for that discharge.

Table B-1

Planning and Resources Division

Cost Allocation Summary

(Based on Optimal Case 10/94)

Without Contingencies

FILTRATION PROJECTS	Existing Demand	New Demand
All Facilities - Discharge Elimination	77%	23%
All Filtration Plants & Distribution System - Chemical Spill Containment	77%	23%
All Filtration Plants - Oxidation Retrofit Program	77%	23%
Diemer & Weymouth Filtration Plants - Install Emergency Generators	93%	7%
Diemer Filtration Plant - Miscellaneous Site Improvements	100%	0%
Diemer, Weymouth & Jensen Filtration Plants - Sludge Handling Study	85%	15%
Filtr. Plants, Distr. System, & Colorado River Aqueduct - Backflow Prevention Assemblies	100%	0%
Jensen Filtration Plant - Expansion No. 1	50%	50%
Jensen Filtration Plant - Replace Filter Media and Chemical Storage Tanks	100%	0%
Lake Perris Pumpback Expansion No. 3	0%	100%
Mills Filtration Plant - Expansion No. 2	20%	80%
Mills Filtration Plant - Landfill	34%	66%
San Joaquin Reservoir - Improvement	100%	0%
Skinner Filtration Plant - Miscellaneous Site Improvements	75%	25%
Skinner Filtration Plant - Emergency Power Generating System	75%	25%
Skinner Filtration Plant - Install Effluent Adjustable Weir Slide Gates	75%	25%
Skinner Filtration Plant - Landfill	75%	25%
Skinner Filtration Plant - Module 1-3, Electrical Conduit & Wireways Replacement	75%	25%
Skinner Filtration Plant - Modules 4, 5, & 6 Sedimentation Basins	75%	25%
Warehouse & Storage Building at Mills Filtration Plant	75%	25%
Water Quality - Demonstration-Scale Testing	77%	23%
Water Quality Laboratory Expansion	77%	23%
Weymouth Filtration Plant - Miscellaneous Site Improvements	86%	14%
Weymouth, Diemer, & Skinner Filtration Plants - Ferric Chloride Retrofit	87%	13%
Total Water Quality/Treatment (Existing Plants)	**71%**	**29%**
Central Pool Augmentation Filtration Plant - Site Acquisition	0%	100%
Central Pool Augmentation Filtration Plant	0%	100%
Central Pool Augmentation Filtration Plant Expansion 1	0%	100%
Total Central Pool Augmentation (Filtration Projects)	**0%**	**100%**
Perris/San Jacinto Area Study	0%	100%
Perris Filtration Plant	0%	100%
Perris Filtration Plant Expansion	0%	100%
Total Perris Filtration Plant	**0%**	**100%**
TOTAL FOR FILTRATION PROJECTS	**31%**	**69%**

Table B-2

New Demand Dollars

(Based on Optimal Case 10/94)
($ Thousands - Escalated)

FILTRATION PROJECTS	New Capacity	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	Total Demand Dollars 94/95 - 19/20
All Facilities - Discharge Elimination	23.0%	39.2	1,262.2	33.3	8.9	8.1	5.5	5.1	5.4	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,370.5
All Filtration Plants & Distribution System - Chemical Spill Containment	23.0%	2,138.1	1,965.8	380.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,484.1
All Filtration Plants - Oxidation Retrofit Program	23.0%	2,552.1	2,691.0	15,617.2	23,389.7	21,774.5	18,225.3	12,898.6	9,404.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106,552.7
Diemer & Weymouth Filtration Plants - Install Emergency Generators	7.0%	58.4	64.5	152.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	275.1
Diemer Filtration Plant - Miscellaneous Site Improvements	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diemer, Weymouth & Jensen Filtration Plants - Sludge Handling Study	15.0%	27.5	18.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46.4
Filtr. Plants, Distr. System, & Colorado River Aqueduct - Backflow Prevention Assemblies	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jensen Filtration Plant - Expansion No. 1	50.0%	9,905.1	3,433.2	950.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,288.5
Jensen Filtration Plant - Replace Filter Media and Chemical Storage Tanks	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lake Perris Pumpback Expansion No. 3	100.0%	1,970.2	3,730.4	961.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,661.6
Mills Filtration Plant - Expansion No. 2	80.0%	35,436.5	21,854.0	7,274.5	1,776.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66,341.0
Mills Filtration Plant - Landfill	66.0%	228.1	2,136.2	214.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,579.1
San Joaquin Reservoir - Improvement	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skinner Filtration Plant - Miscellaneous Site Improvements	25.0%	-	-	50.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.5
Skinner Filtration Plant - Emergency Power Generating System	25.0%	342.1	169.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	511.6
Skinner Filtration Plant - Install Effluent Adjustable Weir Slide Gates	25.0%	-	-	123.1	32.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	155.3
Skinner Filtration Plant - Landfill	25.0%	157.3	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	255.3
Skinner Filtration Plant - Module 1-3, Electrical Conduit & Wireways Replacement	25.0%	57.2	23.2	24.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105.3
Skinner Filtration Plant - Modules 4, 5, & 6 Sedimentation Basins	25.0%	405.8	2,512.7	5,026.8	880.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,825.3
Warehouse & Storage Building at Mills Filtration Plant	25.0%	59.5	261.5	471.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	791.9
Water Quality - Demonstration-Scale Testing	23.0%	543.4	956.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,500.2
Water Quality Laboratory Expansion	23.0%	130.6	693.1	2,251.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,075.5
Weymouth Filtration Plant - Miscellaneous Site Improvements	14.0%	324.1	-	19.8	114.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	458.1
Weymouth, Diemer, & Skinner Filtration Plants - Ferric Chloride Retrofit	13.0%	137.6	327.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	465.2
Total Water Quality/Treatment (Existing Plants)	28.8%	54,672.7	42,198.5	33,551.1	26,201.0	21,782.7	18,230.7	12,903.7	9,409.8	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	218,953.0
Central Pool Augmentation Filtration Plant - Site Acquisition	100.0%	13,038.8	20,591.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33,629.9
Central Pool Augmentation Filtration Plant	100.0%	-	-	-	-	-	-	7,137.7	11,537.1	8,693.8	31,885.5	46,645.0	48,979.2	50,606.4	10,208.2	-	-	-	-	-	-	-	-	-	-	-	-	215,692.8
Central Pool Augmentation Filtration Plant Expansion 1	100.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,750.1	14,175.1	14,883.9	117,210.6	123,071.2	129,224.6	-	-	-	-	-	-	405,315.5
Total Central Pool Augmentation (Filtration Projects)	100.0%	13,596.8	20,591.1	-	-	-	-	7,137.7	11,537.1	8,693.8	31,885.5	46,645.0	48,979.2	50,606.4	10,208.2	6,750.1	14,175.1	14,883.9	117,210.6	123,071.2	129,224.6	-	-	-	-	-	-	655,196.2
Perris/San Jacinto Area Study	100.0%	-	303.2	165.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	468.7
Perris Filtration Plant	100.0%	-	-	-	-	-	-	-	1,141.2	1,198.3	5,032.8	5,284.4	41,614.6	43,695.4	45,880.1	-	-	-	-	-	-	-	-	-	-	-	-	143,846.7
Perris Filtration Plant Expansion	100.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,927.3	6,147.3	6,454.7	50,830.6	53,372.1	56,040.7	-	-	175,772.8
Total Perris Filtration Plant	100.0%	19,894.9	303.2	165.5	-	-	-	-	1,141.2	1,198.3	5,032.8	5,284.4	41,614.6	43,695.4	45,880.1	-	-	-	-	2,927.3	6,147.3	6,454.7	50,830.6	53,372.1	56,040.7	-	-	339,983.1
TOTAL FOR FILTRATION PROJECTS	69.2%	88,164.3	63,092.7	33,716.7	26,201.0	21,782.7	18,230.7	20,041.4	22,088.1	9,894.9	36,918.3	51,929.4	90,593.8	94,301.8	56,088.3	6,750.1	14,175.1	14,883.9	117,210.6	125,998.5	135,372.0	6,454.7	50,830.6	53,372.1	56,040.7	-	-	1,214,132.3

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plants. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Jensen Plant:
  Existing Peak Demand = 850 cfs
  Capacity with Expansion #1 = 1,160 cfs
Weymouth Plant:
  Existing Peak Demand = 690 cfs
  Capacity = 800 cfs
Diemer Plant:
  Existing Peak Demand = 800 cfs
  Capacity = 800 cfs
Mills Plant:
  Existing Peak Demand = 170 cfs
  Capacity with Expansion #2 = 500 cfs
Skinner Plant:
  Existing Peak Demand = 600 cfs
  Capacity with Expansion #3 = 800 cfs

A. Allocation to Existing Demand:
  = (Sum of Existing Peak Demands) ÷ (Sum of Capacities)
  = (850 + 690 + 800 + 170 + 600) cfs ÷ (1,160 + 800 + 800 + 500 + 800) cfs
  = 77 percent

B. Allocation to New Demand = 23 percent

All Filtration Plants & Distribution System - Chemical Spill Containment

This project minimizes the chance of contamination in the event of a chemical spill.

Allocation of this project, as all projects common to all filtration plants, is 77 percent to existing demand and 23 percent to new demand.

All Filtration Plants - Oxidation Retrofit Program

This project evaluates the use of ozone as a disinfectant to reduce disinfection byproducts in Metropolitan's system.

Allocation of this project, as all projects common to all filtration plants, is 77 percent to existing demand and 23 percent to new demand.

Diemer and Weymouth Filtration Plants - Install Emergency Generators

This project ensures that the plants continue to operate during extended power outages.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plants. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Diemer Plant:
 Existing Peak Demand = 800 cfs
 Capacity = 800 cfs
Weymouth Plant:
 Existing Peak Demand = 690 cfs
 Capacity = 800 cfs

A. Allocation to Existing Demand:
 = (Sum of Existing Peak Demands) ÷ (Sum of Capacities)
 = (800 + 690) cfs ÷ (800 + 800) cfs
 = 93 percent

B. Allocation to New Demand = 7 percent

Diemer Filtration Plant - Miscellaneous Site Improvements

Several Capital Improvement Projects to maintain and modify existing equipment are planned for the Diemer plant.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plant. This demand was then compared to filtration plant capacity. Because the Diemer plant is already fully utilized by existing demands, allocation of these projects is 100 percent to existing demand.

Diemer, Weymouth & Jensen Filtration Plants - Sludge Handling Study

This project investigates mechanical sludge dewatering procedures for the Diemer, Weymouth & Jensen Plants.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plants. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Diemer Plant:
Existing Peak Demand = 800 cfs
Capacity = 800 cfs
Weymouth Plant:
Existing Peak Demand = 690 cfs
Capacity = 800 cfs
Jensen Plant:
Existing Peak Demand = 850 cfs
Capacity with Expansion #1 = 1,160 cfs

A. Allocation to Existing Demand:
= (Sum of Existing Peak Demands) ÷ (Sum of Capacities)
= (800 + 690 + 850) cfs ÷ (800 + 800 + 1,160) cfs
= 85 percent

B. Allocation to New Demand = 15 percent

Filter Plants, Distribution System, and Colorado River Aqueduct - Backflow Prevention Assemblies

This project minimizes the opportunity for cross-connections with contaminants that may be present in the plant. It is required to comply with water quality regulations. Allocation of this project is 100 percent to existing demand.

Jensen Filtration Plant Expansion No. 1

This project expands the capacity of the Jensen plant to compensate for the loss of filtration capacity resulting from implementation of more stringent water quality regulations.

To allocate this filtration plant project, Metropolitan first determined the filtration capacity that was lost due to the regulations. This loss was then compared to the capacity of the filtration plant expansion project. Dividing the loss of plant capacity by the capacity of the expansion project shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Historic Capacity = 850 cfs
Current Capacity = 540 cfs
Lost Capacity due to regulations
= (Historic Capacity) - (Current Capacity)
= 850 cfs - 540 cfs
= 310 cfs
Total Capacity of Jensen Filtration Plant with Expansion #1 = 1,160
Capacity of the Jensen Filtration Plant Expansion #1

= (Capacity with Expansion) - (Current Capacity)
= 1,160 cfs - 540 cfs
= 620 cfs

A. Allocation to Existing Demand
= (Lost Capacity) ÷ (Capacity of Expansion #1)
= 310 cfs ÷ 620 cfs
= 50 percent

B. Allocation to New Demand = 50 percent

Jensen Filtration Plant - Replace Filter Media

This project replaces the filter media.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plant. This demand was then compared to filtration plant capacity. Since the plant has operated at its capacity, allocation of this project is 100 percent to existing demand.

Lake Perris Pumpback Expansion No. 3

This project would expand the existing pump station that pumps either Colorado River Aqueduct water or Lake Perris water to the Mills Filtration Plant. The facility is sized to convey half of the filtration plant capacity. To allocate this project, Metropolitan compared the required capacity to the existing capacity. Since the pumpback capacity exceeds the historic required capacity, the project is allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Historic Mills Filtration Plant Capacity = 240 cfs
Required Pumpback Capacity = 240 ÷ 2
= 120 cfs
Current Pumpback Capacity = 150 cfs

A. Allocation to Existing Demand
= (Required Capacity) - (Current Capacity)
= 120 cfs - 150 cfs
= < 0
= 0 percent

B. Allocation to New Demand = 100 percent

Mills Filtration Plant - Expansion No. 2

This project expands the capacity of the Mills Plant to compensate for the loss of filtration capacity resulting from implementation of more stringent water quality regulations.

To allocate this filtration plant project, Metropolitan first determined the filtration capacity that was lost due to the regulations. This loss was then compared to the capacity of the filtration plant expansion project. Dividing the loss of plant capacity by the capacity of the expansion project shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Historic Capacity = 240 cfs
Current Capacity = 170 cfs
Lost Capacity due to Regulations
= (Historic Capacity) - (Current Capacity)
= 240 cfs - 170 cfs
= 70 cfs
Total Capacity of Mills Filtration Plant with Expansion #2 = 500 cfs
Capacity of the Mills Filtration Plant Expansion #2
= (Capacity with Expansion) - (Current Capacity)
= 500 cfs - 170 cfs
= 330 cfs

A. Allocation to Existing Demand
= (Lost Capacity) ÷ (Capacity of Expansion #2)
= 70 cfs ÷ 330 cfs
= 20 percent

B. Allocation to New Demand = 80 percent

Mills Filtration Plant - Landfill

This project evaluates sizes, sites, and constructs a landfill for sludge from the Mills Plant.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plant. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Existing Peak Demand = 170 cfs
Capacity with Expansion #2 = 500 cfs

A. Allocation to Existing Demand
= (Existing Peak Demand) ÷ (Capacity with Expansion #2)
= 170 cfs ÷ 500 cfs
= 34 percent

B. Allocation to New Demand = 66 percent

San Joaquin Reservoir Improvement Project

This project covers the existing reservoir as required to meet the Safe Drinking Water Act. Allocation of this project is 100 percent to existing demand.

Skinner Filtration Plant - Miscellaneous Site Improvements

Several Capital Improvement Projects to maintain and modify existing equipment are planned for the Skinner plant.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plant. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Existing Peak Demand = 600 cfs
Capacity = 800 cfs

A. Allocation to Existing Demand
= Existing Peak Demand ÷ Capacity
= 600 cfs ÷ 800 cfs
= 75 percent

B. Allocation to New Demand = 25 percent

Skinner Filtration Plant - Emergency Power Generating System

This project installs an emergency power generating system at the Skinner plant.

Allocations are the same as those described under the previous Skinner Filtration Plant project.

Skinner Filtration Plant - Install Effluent Adjustable Weir Slide Gates

This project installs adjustable effluent weir slide gates to improve filter cleaning.

Allocations are the same as those described under the previous Skinner Filtration Plant project.

Skinner Filtration Plant - Landfill

This project designs and constructs a landfill for sludge from the Skinner Filtration Plant.

Allocations are the same as described under the previous Skinner Filtration Plant project.

Skinner Filtration Plant - Module 1-3, Electrical Conduit and Wireways Replacement

The project replaces the electrical conduit and wireways in 54 filters on Modules 1-3 at the Skinner Plant.

Allocations are the same as described under the previous Skinner Filtration Plant project.

Skinner Filtration Plant - Modules 4, 5, & 6 Sedimentation Basins

The project designs and constructs sedimentation basins at the Skinner plant to comply with anticipated water quality regulations.

Allocations are the same as described under the previous Skinner Filtration Plant project.

Warehouse & Storage Building at Mills Filtration Plant

This project designs and constructs a warehouse and storage building at the Mills Plant to accommodate the increase number of personnel resulting from consolidation of facilities.

Allocations are the same as described under the previous Mills Filtration Plant project.

Water Quality - Demonstration-Scale Testing

This study evaluates the use of ozone as a disinfectant to reduce disinfection byproducts in Metropolitan's system.

Allocation of this project, as all projects common to all filtration plants, is 77 percent to existing demand and 23 percent to new demand.

Water Quality - Laboratory Expansion

This project enlarges the water quality laboratory.

Allocation of this project, as all projects common to all filtration plants, is 77 percent to existing demand and 23 percent to new demand.

Weymouth Filtration Plant - Miscellaneous Site Improvements

Several Capital Improvement Projects to maintain and modify existing equipment are planned for the Weymouth plant.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plant. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Existing Peak Demand = 690 cfs
Capacity = 800 cfs

A. Allocation to Existing Demand
= (Existing Peak Demand) ÷ (Capacity)
= 690 cfs ÷ 800 cfs
= 86 percent

B. Allocation to New Demand = 14 percent

Weymouth, Diemer, Skinner Filtration Plants - Ferric Chloride Retrofit

This project installs ferric chloride chemical feed systems at the Weymouth, Diemer, and Skinner plants. The new chemical feed systems will allow for more efficient coagulation of different water qualities.

To allocate this filtration plant project, Metropolitan first determined the current demand on the filtration plants. This demand was then compared to filtration plant capacity. Dividing existing demands (in cfs of filtration capacity) by filtration plant capacity shows the percentage portion of the project to be utilized for current requirements. The remaining portion of the project is the portion allocated to serve anticipated new demand.

In equation form, the allocation is as follows:

Weymouth Plant:
Existing Peak Demand= 690 cfs
Capacity = 800 cfs
Diemer Plant:
Existing Peak Demand = 800 cfs
Capacity = 800 cfs
Skinner Plant:
Existing Peak Demand = 600 cfs
Capacity with Expansion #3 = 800 cfs

A. Allocation to Existing Demand:
   = (Sum of Existing Peak Demands) ÷ (Sum of Capacities)
   = (690 + 800 + 600) ÷ (800 + 800 + 800)
   = 87 percent

B. Allocation to New Demand = 13 percent

Central Pool Augmentation (Filtration Projects)

These projects install and expand a new filtration plant to increase the flows from Metropolitan to the eastern portion of Metropolitan's Central Pool service area in Orange and western Riverside counties.

Central Pool Augmentation Filtration Plant - Site Acquisition

This project identifies and acquires critically needed lands for the Central Pool Augmentation Filtration Plant.

Allocation of this project to new demand is 100 percent.

Central Pool Augmentation Filtration Plant

The Central Pool Augmentation Study has currently identified the need for additional treated water capacity and is evaluating alternative sites for the Central Pool Augmentation Filtration Plant. It will be constructed in stages to minimize initial capital outlay. This project is the first stage.

Allocation of this project to new demand is 100 percent.

Central Pool Augmentation Plant Expansion 1

The Integrated Resources Planning Study has identified the future need for enlarging the Central Pool Augmentation Filtration Plant. It will be constructed in stages to minimize initial capital outlay. This project is the second stage.

Allocation of this project to new demand is 100 percent.

Perris Filtration Plant

This project installs a new filtration plant to increase the flows from Metropolitan to Riverside County.

Perris/San Jacinto Area Study

This project evaluates alternative sites for the Perris Filtration Plant, which would be constructed to meet new demand. Allocation of this project is 100 percent to new demand.

Perris Filtration Plant—Site Acquisition

This project identifies and acquires critically needed lands for the Perris Filtration Plant.

Perris Filtration Plant

The Perris and San Jacinto Area Study has currently identified the need for additional treated water capacity and is evaluating alternative sites for the Perris Filtration Plant. It will be constructed in stages to minimize initial capital outlay. This project is the first stage.

Allocation of this project to new demand is 100 percent.

Perris Filtration Plant Expansion

The Perris Filtration Plant will be constructed in stages to minimize initial capital outlay. This project is the second stage.

Allocation of this project to new demand is 100 percent.

Appendix C
Summary of Legal Review of Nexus Study

In its action on December 14, 1993, Metropolitan's Board of Directors directed the General Manager "to complete a nexus study with legal review for the new demand charge no later than mid-1994, such that member agencies who choose to do so can pass on the appropriate amount of this charge in their connection fees or other charges."

Metropolitan requested legal review of the nexus study from its outside counsel with respect to rate matters, O'Melveny & Myers. In a letter dated June 10, 1994, Brian S. Currey of O'Melveny & Myers described the new demand charge and the requirements for the nexus study. His letter concluded that "any member agency with authority to impose [fees on new development] would be able to use them to recover that portion of the proposed new demand charge that will result from new development within the member agency's service area."

Such counsel has reviewed interim drafts of the nexus study. Mr. Currey confirmed in a letter dated December 5, 1994, that after reviewing the third draft of the nexus study his earlier conclusion remains unchanged. His letter affirms, "Any member agency with authority to impose fees on new development would be able to use those fees to recover that portion of the proposed New Demand Charge that will result from new development within the member agency's service area."