Allocation of Demand Management Costs

Finance and Insurance Committee
Item 6b
July 8, 2019

Allocation of Demand Management Costs

- Background
  - Board Direction
    - April 2018: Board approved board letter 8-2; directed staff to undertake a Demand Management Cost Allocation Study
  - Current functionalization based on 25-year planning
    - 1996 IRP: "The Preferred Resource Mix of the regional reliability plan forms the basis for determining Metropolitan's facility requirements and capital expenditures from fiscal year 1995-96 through 2019-20....”

Allocation of Demand Management Costs

- Proposed process
  - May 2019: Overview of Demand Management Cost Functionalization
  - July 2019: Demand Management Cost Functionalization for Metropolitan
  - Fall 2019: Incorporating Demand Management Cost Functionalization recommendations into the Cost of Service process
  - December 2019: Budget process
  - February 2020: proposed water rates and charges for calendar years 2021 and 2022

Peter Mayer, P.E.
Principal
Water Demand Management, LLC

- Professional engineer and urban water expert
- 25 years experience
- Urban water management
- Water planning
- Rate analysis
- Demand analysis and forecasting
- Water loss control
- Author of reports evaluating the benefits of demand management programs

Over his career, Peter has worked with hundreds of water utilities and organizations across the US and Canada.

Functional Assignment of Metropolitan's Demand Management Costs

Finance and Insurance Committee

July 8, 2019

Peter Mayer, P.E.

Review	Consider	Present	Step Thru	Explain
WaterDM Project and functional assignment of demand management costs	Metropolitan's history of functional assignment of demand management costs	WaterDM's recommended methodology for demand management functional assignment.	The functional assignment of demand management process and a hypothetical example.	How functional assignment method is consistent with industry understanding of impacts of demand management.

Presentation Outline

WaterDM Project Goals

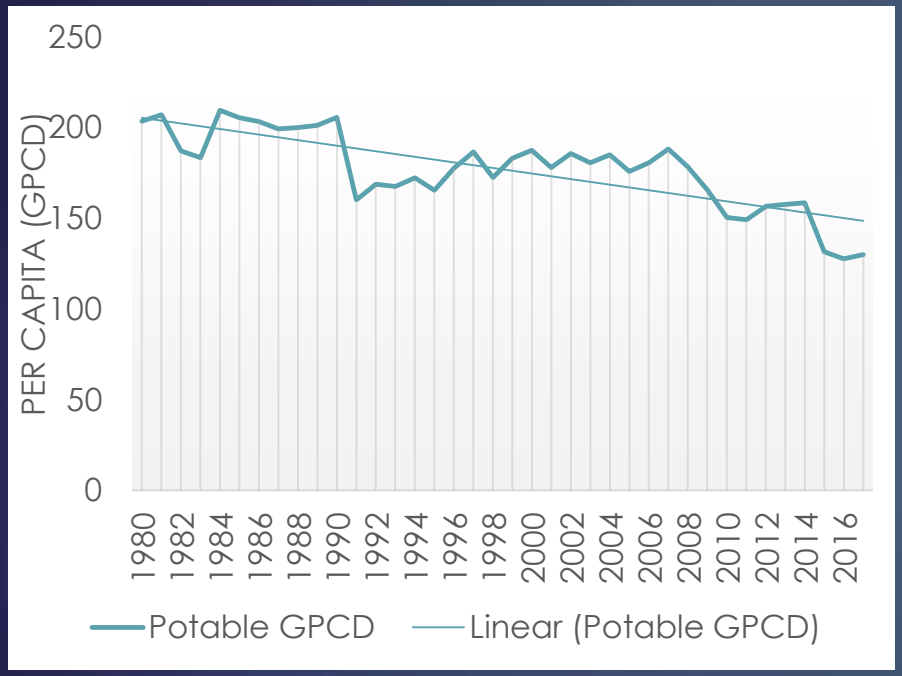
Prepare a recommended methodology for updating Metropolitan's functional assignment of demand management program costs.

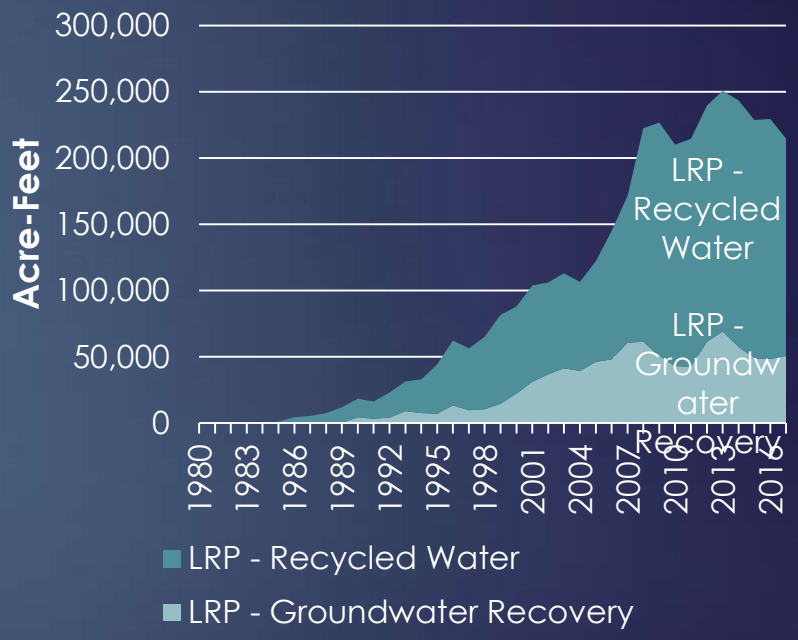
Method should be clear, understandable, and updatable so that Metropolitan can use it regularly in the cost of service rate making process.

Establish conformance of the approach with industry understanding of the impacts of demand management.

Metropolitan Demand Management =

Conservation Program + **Local Resources Program (LRP)**





Metropolitan's flexible, interconnected system benefits all member agencies. Demand management* is a key component of Metropolitan's Preferred Resource Mix to deliver least-cost, sustainable water supply into the future.

*Metropolitan Demand Management also includes the Future Supply Action Program, advertising, and labor.

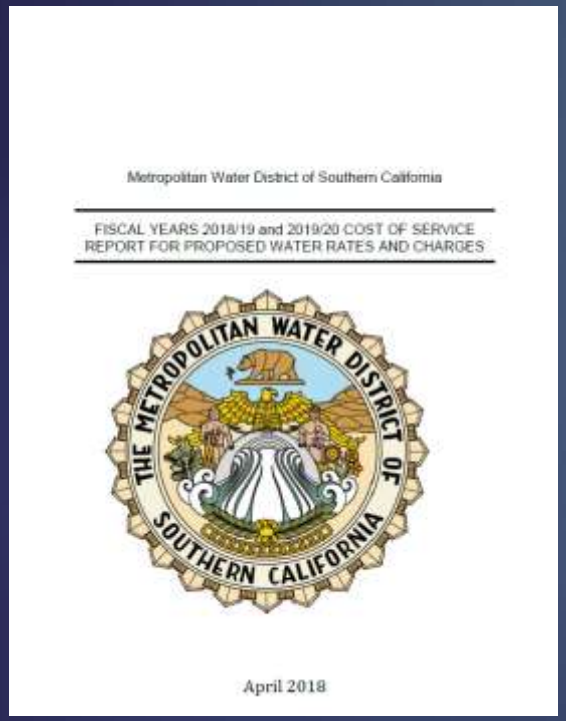
Functional assignment establishes the allocation of the real costs for demand management to the appropriate cost components, in the appropriate relative share.

Adapted from:

AWWA. 2017. Water Rates. M1, Seventh Edition, American Water Works Association. Denver Colorado.

Bonbright, J. C., A.L. Danielson, D.R. Kamerschen. 1988. *Principles of Public Utility Rates.* Public Utilities Report Arlington VA.

Metropolitan Cost of Service Process



Step 1	Develop of Revenue Requirements
Step 2	**Functionalize Costs**
Step 3	Allocate Costs
Step 4	Distribute Costs To Rate Elements

History of Metropolitan Functional Assignment for Demand Management

1996

IRP establishes Demand Management in preferred resource mix

2015

IRP Update focuses on Adaptive Management. "Climate change may prove to be the most significant challenge to water supply reliability for Southern California."

2018-19

WaterDM project to review and update functional assignment approach

Rates unbundled. Demand Management is a functional cost category and the rate is included in transportation based on expected avoided future infrastructure costs.

2001

Metropolitan retrospectively documents ~ $3 billion in avoided transportation infrastructure.

2016, 2018

Adaptive Management
Update Functional Assignment Approach

- **1996 IRP –** *25-year forecast through 2020**

  Identified demand management yet to be implemented, avoided future projects

- **Conclusion of 25-year period – Adaptive management**

  No longer infrastructure-driven

  Changes in regional water supply

  Regulatory constraints

  Climate change

  Reliability and variability of imported supply

  Consideration of new supplies

- **2018-19 Project to Update Functional Assignment Approach**

  Research and develop a well-considered, updatable functional assignment method for demand management, to be used as part of Metropolitan's cost of service process.

WaterDM
DEMAND MANAGEMENT

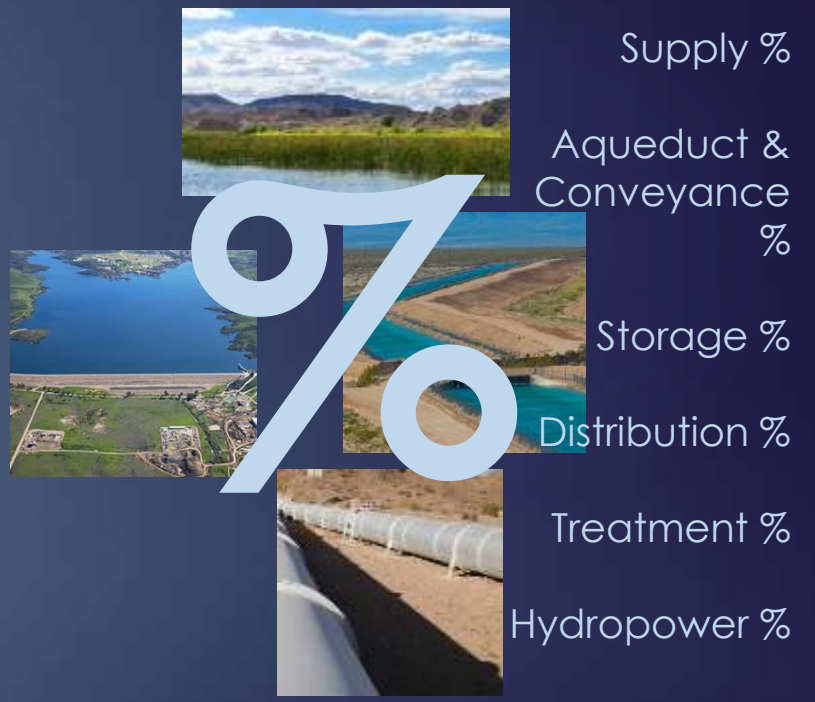
*1996 Integrated Water Resources Plan Vols. 1, 2, and 3. Metropolitan Water District of Southern California, pp. 6-1

Functional Assignment of Demand Management Costs

Real Costs

Method of assignment to functional categories through analysis of avoided costs.

Functional Categories



Supply %

Aqueduct & Conveyance %

Storage %

Distribution %

Treatment %

Hydropower %

In the absence of demand management, Metropolitan must deliver more water and more expenditures would be required in *some* of these categories.

Avoided cost, Marginal cost, Incremental cost

"Marginal cost is synonymous with avoided cost – the cost that would be saved (avoided) by reducing output by a small amount…it is synonymous with incremental cost – the added cost of a small amount of additional output."

Bauman, D.D., J.J. Boland, W.M. Hanemann with Foreword by G.F. White. 1998. Urban Water Demand Management Planning. McGraw-Hill, Inc. New York.

Functional Assignment Methodology

Goal: A clear, understandable, method Metropolitan can update and use regularly in the cost of service rate making process.

Multiple approaches possible.

Functional Assignment Methodology

Avoided cost approach:

In the absence of demand management more water must be delivered, and Metropolitan's system would need to be expanded across each of the impacted categories.

A reasonable and appropriate method to estimate the relative share of impact of demand management offsets into the foreseeable future for the purpose of setting rates is to calculate the relative share of each impacted category's budgeted revenue requirements.

Budgeted revenue requirements are the best available data.

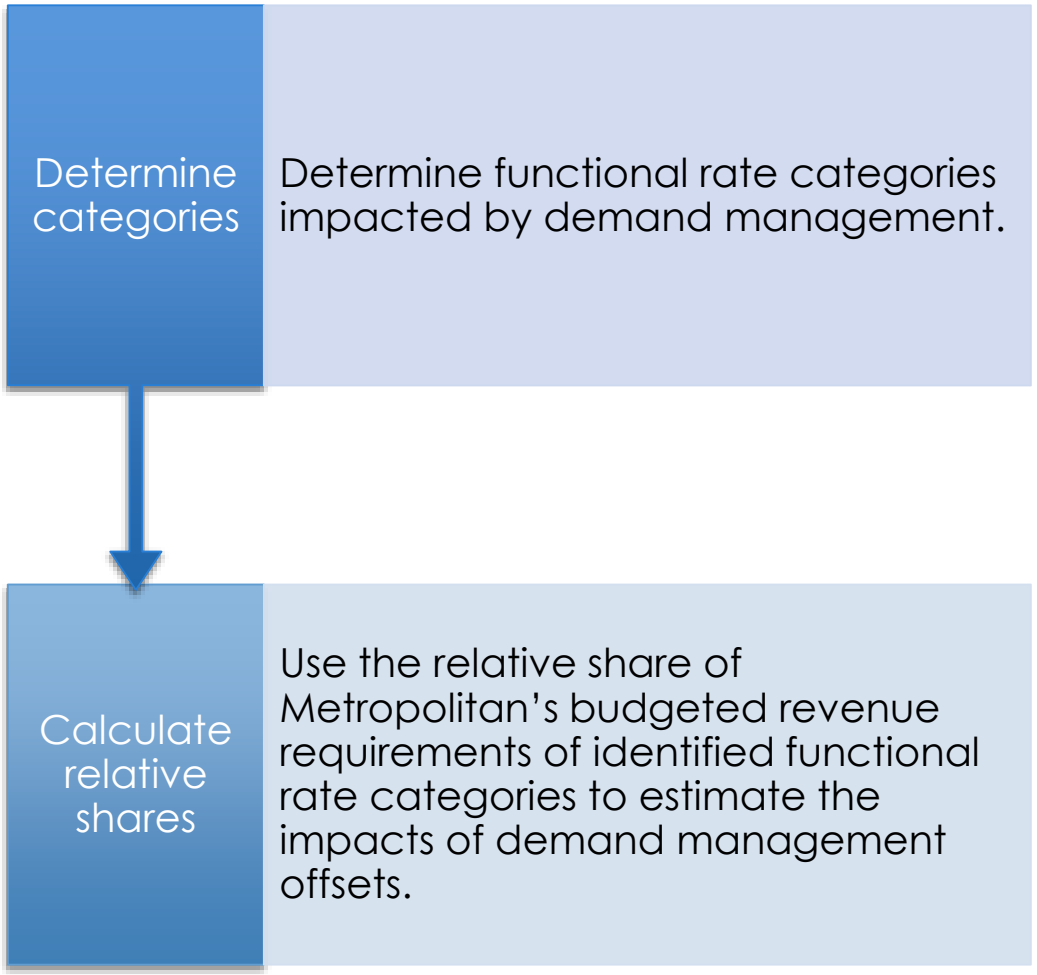
WaterDM Recommendation

To estimate the relative share of impact of demand management offsets into the foreseeable future for the purpose of setting rates…

WaterDM recommends an incremental cost approach to estimate the relative share of avoided marginal costs using Metropolitan's categorized budgeted revenue requirements.

Demand Management Functional Assignment Method

To simply and reasonably estimate the relative share of impact of demand management offsets



Functional Assignment Methodology

Method is objective and updatable.

Input data – Metropolitan's budgeted revenue requirements - are regularly updated as part of Metropolitan's biennial budget and rate setting process.

Determine Impacted Functional Categories

Metropolitan Functional Categories	DM Impact?
Supply	√
Conveyance and Aqueduct	√
Distribution	√
Storage	√
Treatment	X
Hydroelectric	X

Determine Impacted Functional Categories

Metropolitan Functional Categories	DM Impact?	Comment
Treatment	X	Treatment capacity is being downsized by Metropolitan.* DM does not avoid additional costs for treatment.
Hydroelectric	X	DM does not avoid additional costs for hydroelectric generation.

*Metropolitan Water District of Southern California. Feb. 13, 2017 Presentation to the Engineering and Operation Committee Item 6a, Review of Water Treatment Operating Capacities.

Determine Impacted Functional Categories

Metropolitan Functional Categories	DM Impact?	Comments
Supply	√	DM avoids annual water transfers and defers long-term supply investments.

In the absence of DM, meeting higher demands would require additional supply through annual water transfers and long-term supply investments. DM avoids associated O&M and capital expenses.

Determine Impacted Functional Categories

Metropolitan Functional Categories	DM Impact?	Comments
Conveyance & Aqueduct	√	DM continues to avoid annual O&M and defer long-term infrastructure investments.

Conveyance and aqueduct includes the Colorado River Aqueduct and the State Water Project.

DM avoids and defers conveyance system expansion.

Determine Impacted Functional Categories

Metropolitan Functional Categories	DM Impact?	Comments
Distribution	√	DM avoids annual O&M and defers long-term infrastructure investments.

Distribution generally includes conveyance within Metropolitan's service area.

DM avoids and defers distribution system expansion.

Determine Impacted Functional Categories

Metropolitan Functional Categories	DM Impact?	Comments
Storage	√	DM avoids annual O&M and defers infrastructure investments.

Storage includes emergency, dry year, and regulatory storage.

In the absence of DM, meeting higher demands would require additional storage in all categories and associated O&M and capital expenses.

Functional Assignment Process

Functional assignment establishes the allocation of the revenue requirement for demand management to the appropriate cost components, in the appropriate relative share.

DATA	CALCULATION	FUNCTIONAL ASSIGNMENT
Budgeted revenue requirement (million $/year) for each impacted functional category.	Divide category revenue requirement by total to calculate percent of total for each impacted functional category.	Supply % Aqueduct & Conveyance % Storage % Distribution %
		If Metropolitan is required to deliver more water, more expenditures would be required in each of these categories.

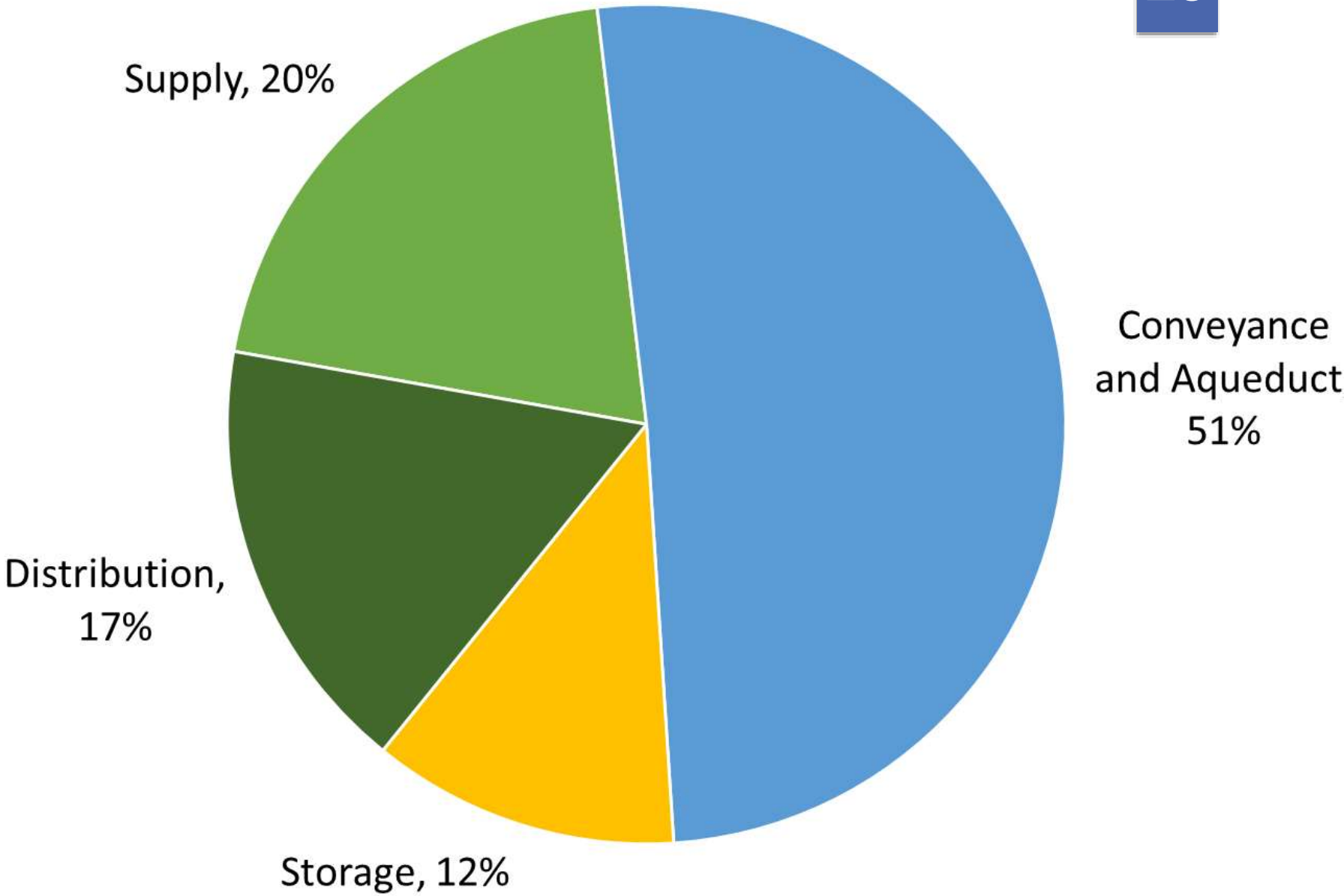
Hypothetical example

Relevant Functional Category	Hypothetical Revenue Requirements* (M$/year)	Demand Management Functional Assignment %
Supply	$ 240	**20%**
Conveyance and Aqueduct	$ 600	**51%**
Storage	$ 140	**12%**
Distribution	$ 200	**17%**
Total Relevant Category	**$ 1,180**	**100%**

*Includes
- Operations and maintenance
- Administrative and general
- Long-term investments and planning

*Excludes
- Demand Management

Hypothetical Demand Management Functional Assignment



Summary

Demand Management Functional Assignment Method

To simply and reasonably estimate the relative share of impact of demand management offsets

Determine categories	Determine functional rate categories impacted by demand management.
Calculate relative share	Utilize the relative share of Metropolitan's budgeted revenue requirements of identified functional rate categories to estimate the impact of demand management offsets.

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