Evaluation of Expenditures, Revenue Sources, and Alternative Water, Wastewater and Stormwater Rate Structures in New York City: Final Report

December 18, 2009

New York City Department of Environmental Protection

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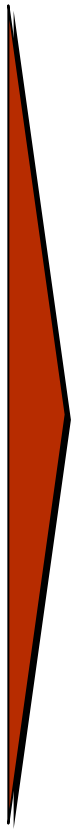
Rate Study Context

- DEP, along with many other large water and wastewater utilities, is experiencing:
  - Increasing capital and operating costs
  - Capital budgets largely driven by Federal and State mandates
  - Aging infrastructure that requires investment
  - Increasing energy costs/Green House Gas (GHG) concerns
  - Decline in per capita and total water usage
- These factors have led to increases in average water/sewer rates in recent years above the rate of inflation in utilities across the nation, including in NYC.
  - These increases are happening in the midst of an economic downturn, when ratepayers are facing an overall increase in the cost of government services, or service cuts.

Rate Study Overview

Study Objectives

- Primary objective of study is to analyze different rate structures and charges, with particular attention paid to:
  - Financial stability (for both DEP and customers)
  - Equity
  - Water conservation
  - Stormwater management
  - Other best management practices
- Other important considerations include:
  - Ratepayer sensitivity
  - Economic competitiveness
  - Implementation
  - Future system needs
  - Affordable housing stock
  - Regulatory/water quality concerns



Key Phases

PHASE 1

- Analyses of DEP's current rate structure and capital and operating expenses.
- Survey of water and wastewater utilities from around the country to identify capital and operating budgets and identify universe of alternative rate structures.
- Meetings with stakeholder groups to facilitate public input and understand key concerns.

PHASE 2

- Analysis of the potential applicability of alternative rate structures for NYC, and their potential impacts.

Rate Study Overview

Key Components of Our Work

- DEP and BAH collected data on approximately 56 water and wastewater utilities nationally, including information on rate structures, capital and operating budgets, and intergovernmental reimbursements and relationships. Data from peer utilities was then compared to NYC.
- Four different types of rate structures/mechanisms were analyzed. Both quantitative and qualitative analyses were performed.
  - Fixed Charges
  - Stormwater Rate Structures
  - New Development Charges
  - Water Conservation Rates

Current Work

- Completed and analyzed individual rate structures.
- Public stakeholder outreach will start in January and be complete by March.
- DEP will present options for potential rate-structure changes by April.

Phase 1: Benchmarking

Information from the following utilities was collected

Water/Wastewater Utilities

- Atlanta Department of Watershed Management
- Baltimore Bureau of Water & Wastewater
- Boston Water & Sewer Commission
- Buffalo Water Authority
- Chicago Department of Water Management
- Columbus Public Utilities
- Dallas Water Utility
- DC Water and Sewer Authority
- Detroit Water and Sewerage Department (DWSD)
- Glendale Water and Wastewater Utilities
- Greensboro Water
- Houston Water/Wastewater Utility
- Irvine Ranch Water District
- Jacksonville (JEA Water and Wastewater Utility)
- Kansas City Water Services Department
- Miami-Dade County Water and Sewer Department (WASD)
- New Orleans Sewerage & Water Board
- Newark Department of Water & Sewer Utilities
- Niagara Falls Water Board
- Oakland / East Bay Municipal Utility District
- Orlando Utilities Commission
- Philadelphia Water Department
- Phoenix Water Services Department
- Pittsburgh Water and Sewer Authority
- San Antonio Water System
- San Francisco Public Utilities Commission
- Seattle Public Utilities
- St. Louis Water and Wastewater Department
- Washington Sanitary Suburban Commission (WSSC)

Water Utilities

- Cleveland Division of Water
- Denver Water
- Greater Cincinnati Water Works
- Honolulu Board of Water Supply
- Indianapolis Water
- Las Vegas Valley Water District
- Los Angeles Department of Water & Power
- Louisville Water Company
- Metropolitan Water District (MWD) of Southern California
- Milwaukee Water Works
- Portland Water Bureau
- San Diego County Water Authority
- San Diego Water Department
- San Jose Municipal Water System
- Southern Nevada Water Authority
- Suffolk County (NY) Water Authority
- Utica (Mohawk Valley Water Authority)

Wastewater Utilities

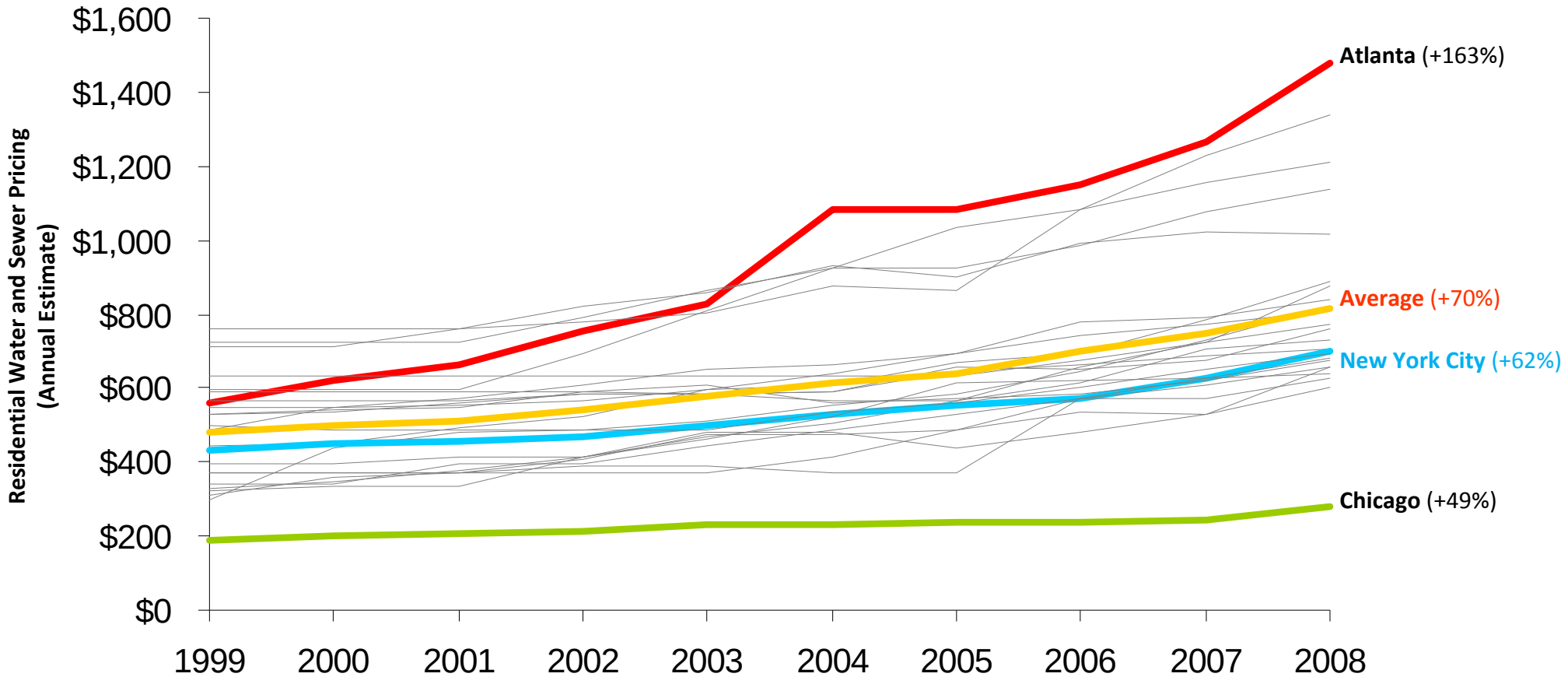
- Chicago Metropolitan Water Reclamation Department
- Cleveland Northeast Regional Sewer District
- Denver Wastewater Management Division
- Honolulu ENV (Department of Environmental Services)
- Las Vegas / Clark County Water Reclamation District
- Los Angeles Bureau of Sanitation
- Louisville / Jefferson County Metropolitan Sewer District
- Milwaukee Metropolitan Sewer District
- San Diego Metropolitan Wastewater Department

INFORMATION FROM UTILITIES WAS COLLECTED AT VARYING LEVELS OF DETAIL. 26 UTILITIES SHOWN IN RED PROVIDED MODERATE TO SIGNIFICANT INFORMATION.

Phase 1 Benchmarking Highlights

- Similar to DEP, water utility rates across the country have significantly increased over the past decade.
- Maintenance of aging infrastructure and compliance with Federal and State mandates are primary drivers behind capital expenditure programs.
- DEP finances its capital program through the proceeds of debt more than most other utilities surveyed.
- DEP's intergovernmental transfer, or rental payment, is comparable to the average of other cities surveyed, however, no other utility surveyed linked the amount of a transfer payment to debt service.

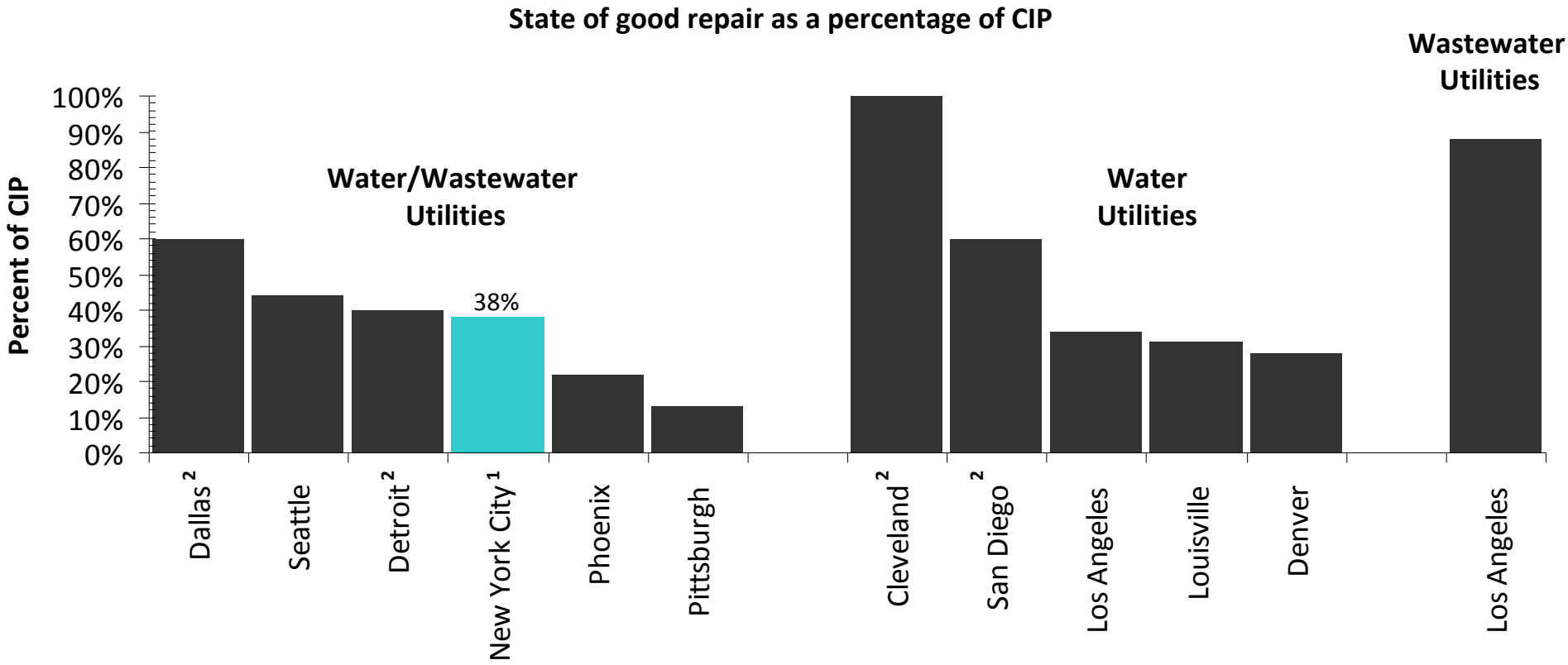
Rates around the country have increased over the past decade and NYC's rates and rate of increases are still below the national average



Notes:
1. Percentages reflect overall change between 1999 and 2008.
2. Amounts are taken from annual survey performed on behalf of the NYC Municipal Water Finance Authority.

Source: Booz Allen, Amawalk, NYCDEP

State of good repair costs are high as a percentage of the total Capital Investment Plan (CIP), largely due to aging infrastructure, however costs are consistent with other utilities

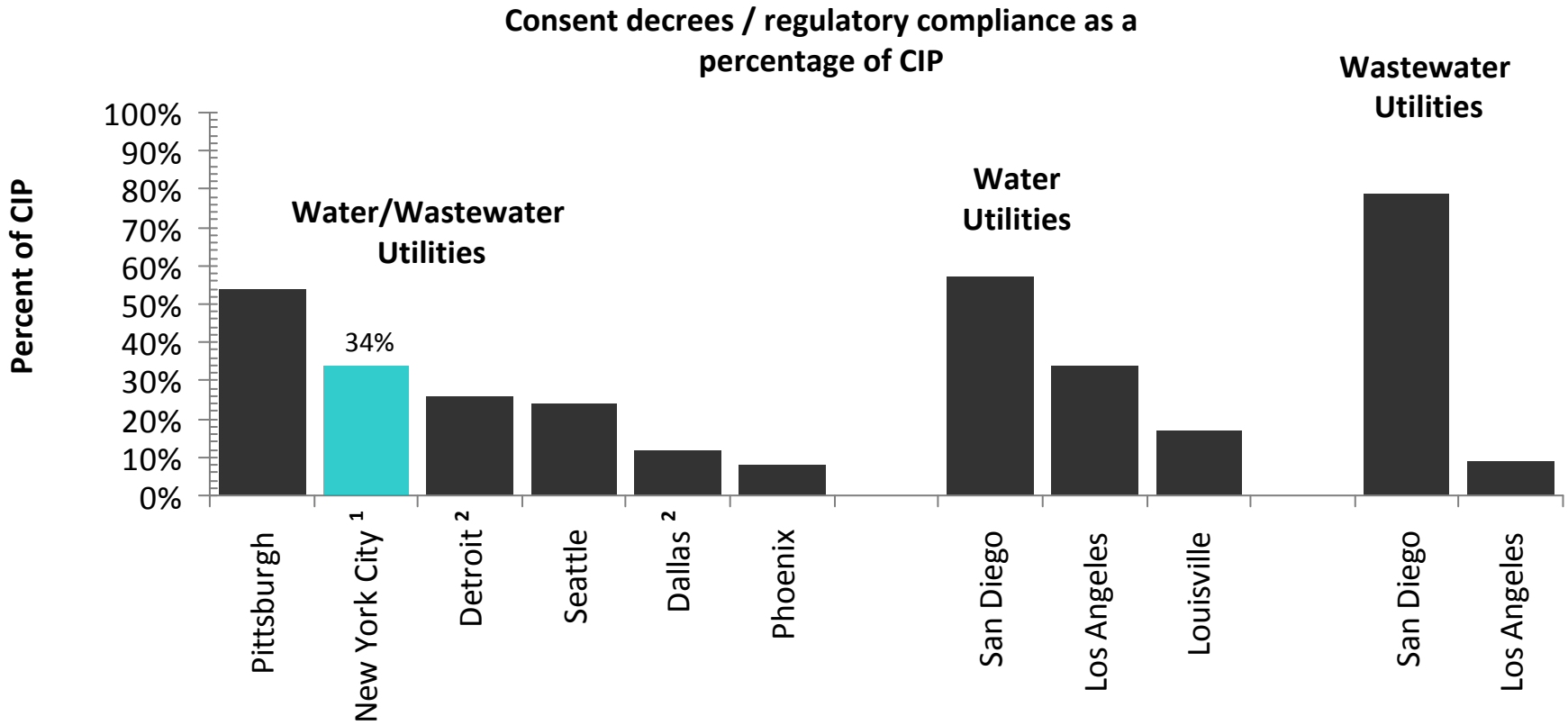


- CIP percentages shown are of 5-year, 10-year, or 11-year plans depending on the utility.

Footnotes:
1. Value for NYC based on budget for State of Good Repair (SOGR) and portion of BWSO projects identified in CIP.
2. Estimated percentage provided by utility.
3. Values shown reflect utiilities' CIPs current at the time of analysis.

Source: Booz Allen analysis

Future capital commitments associated with mandates are relatively higher when compared to other combined water/wastewater utilities

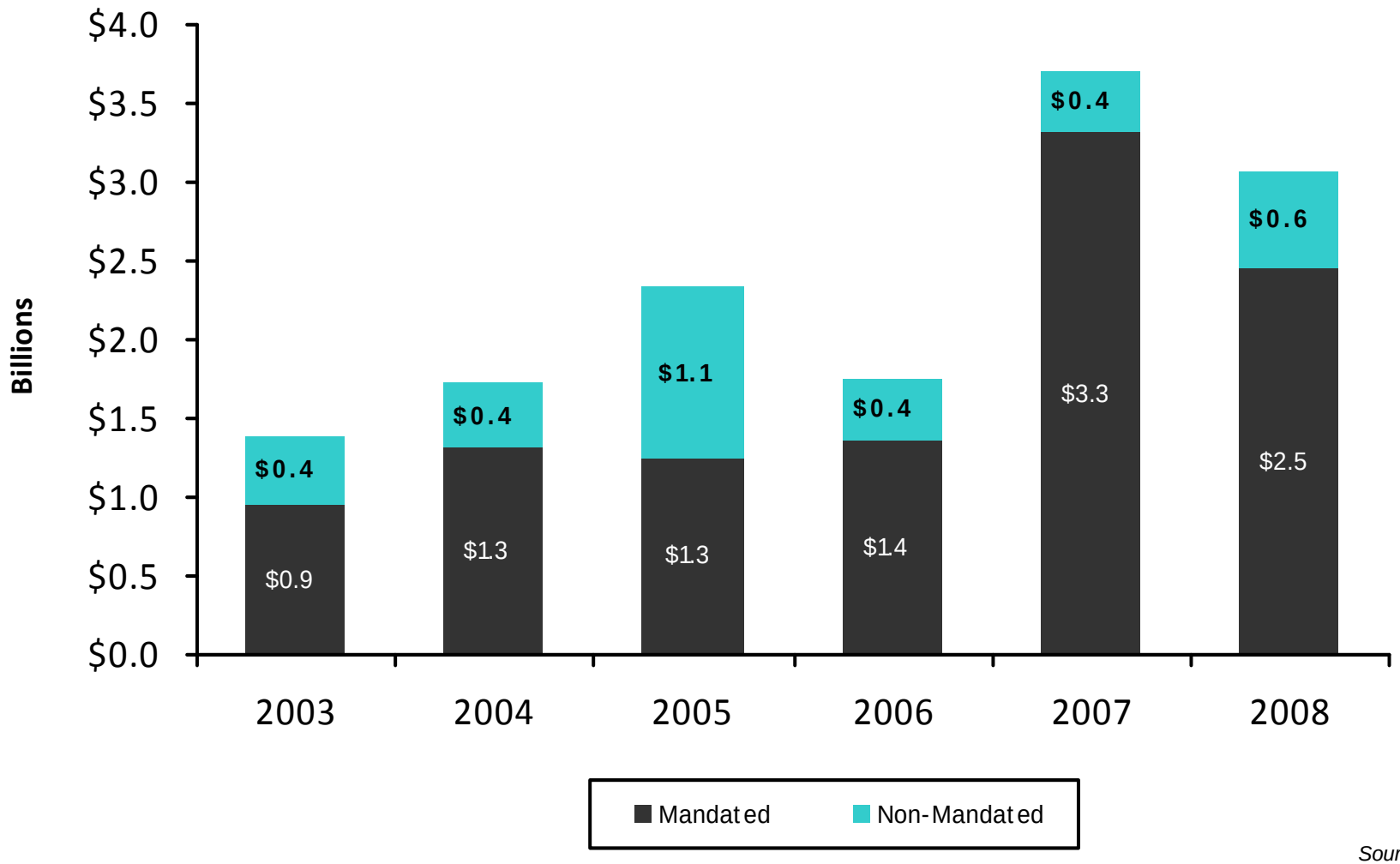


- CIP percentages shown are of 5-year, 10-year, or 11-year plans depending on the utility.

Footnotes:
1. Value for NYC based on budget for Mandated projects identified in CIP.
2. Estimated percentage provided by utility.
3. Values shown reflect utiilities' CIPs current at the time of analysis.

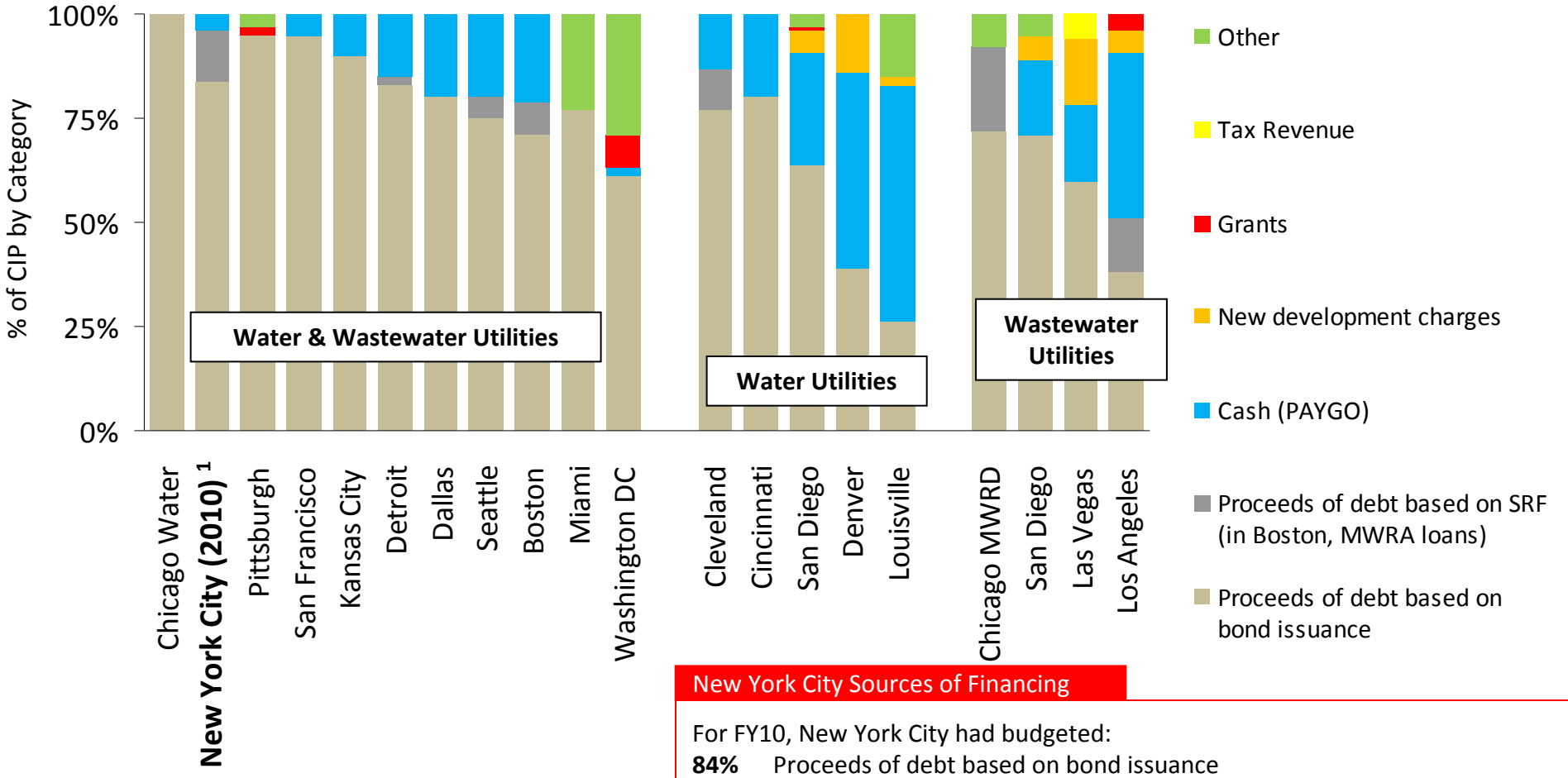
Source: Booz Allen analysis

Historically, mandated projects comprised 3/4 of the Capital Investment Plan



Source: Booz Allen analysis

Because of mandates, DEP is more leveraged than most other utilities, financing more than 95% of its capital program with proceeds from debt



New York City Sources of Financing

For FY10, New York City had budgeted:

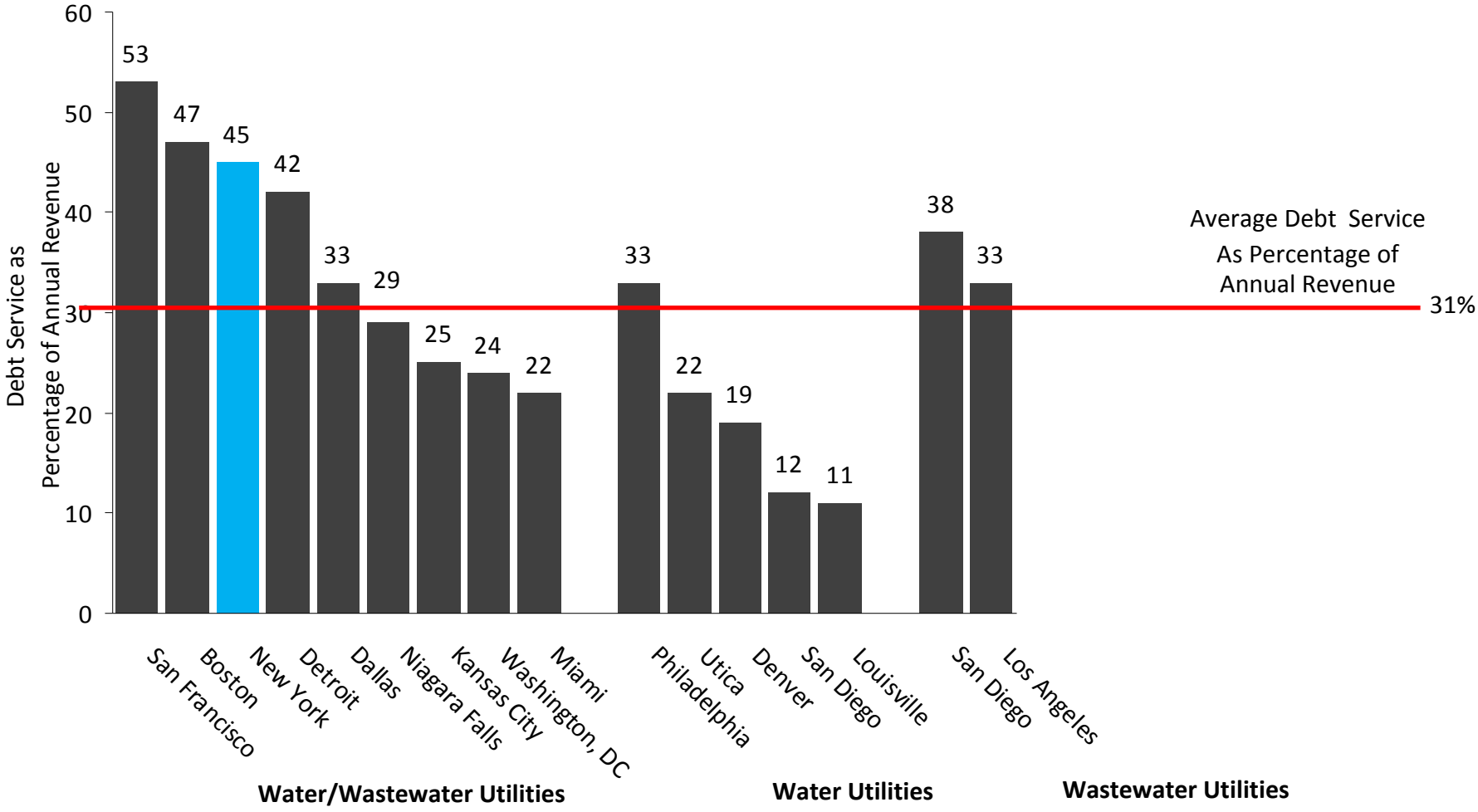
84%	Proceeds of debt based on bond issuance
12%	Proceeds of debt based on SRF loans (Note: Additional funding through SRF is expected through the American Recovery and Reinvestment Act)
4%	PAYGO

Footnotes:

1. NYC amounts do not include FY10 stiumulus funding of $220M directed to capital program.

Source: Booz Allen analysis

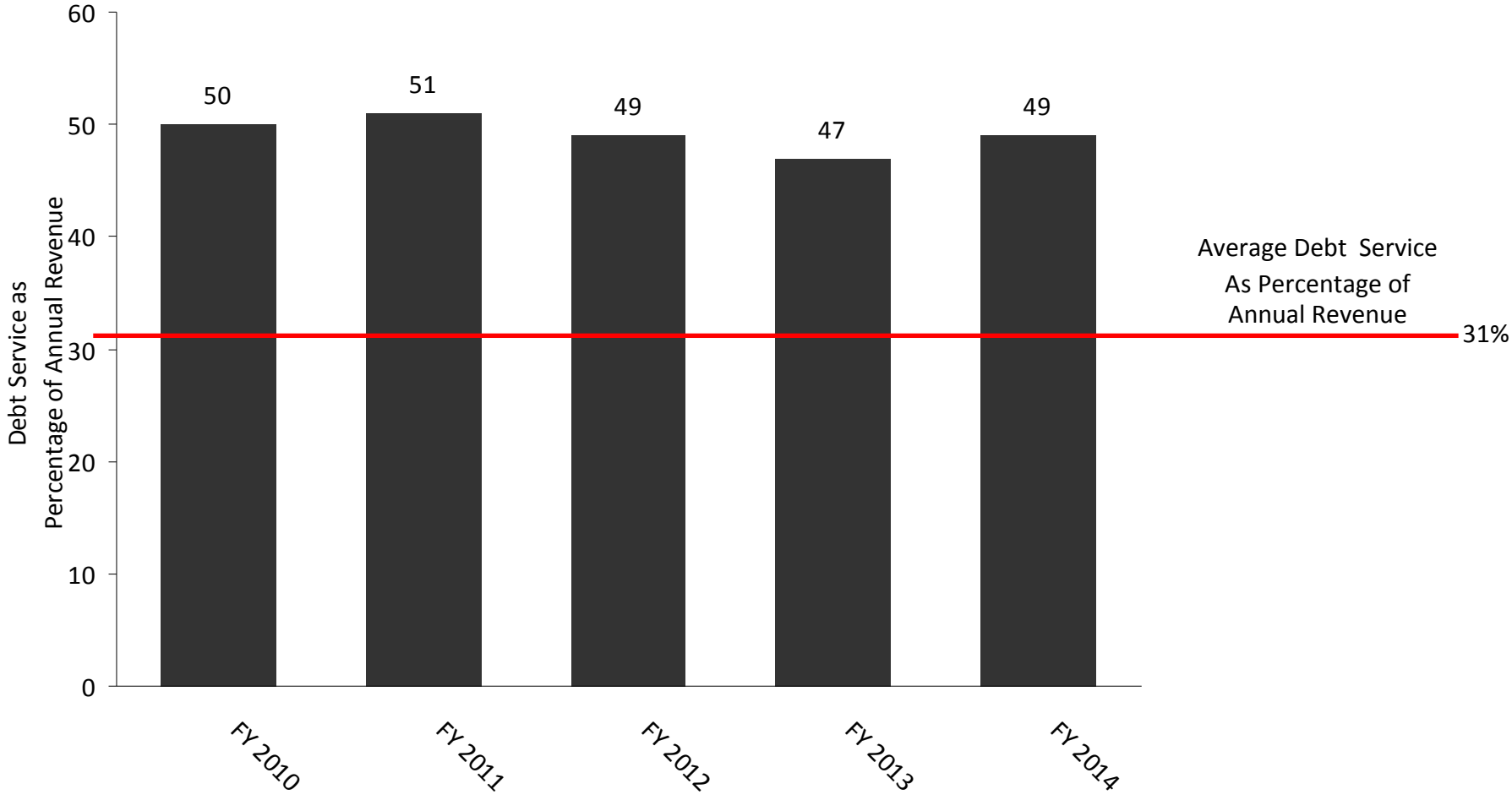
As a result of mandates and high debt, NYC's annual debt service is also higher than average and is a driver of rate increases



Notes:
1. Value for NYC includes general obligation debt service.
2. Values shown reflect budgets current at the time of analysis.

Source: Booz Allen analysis

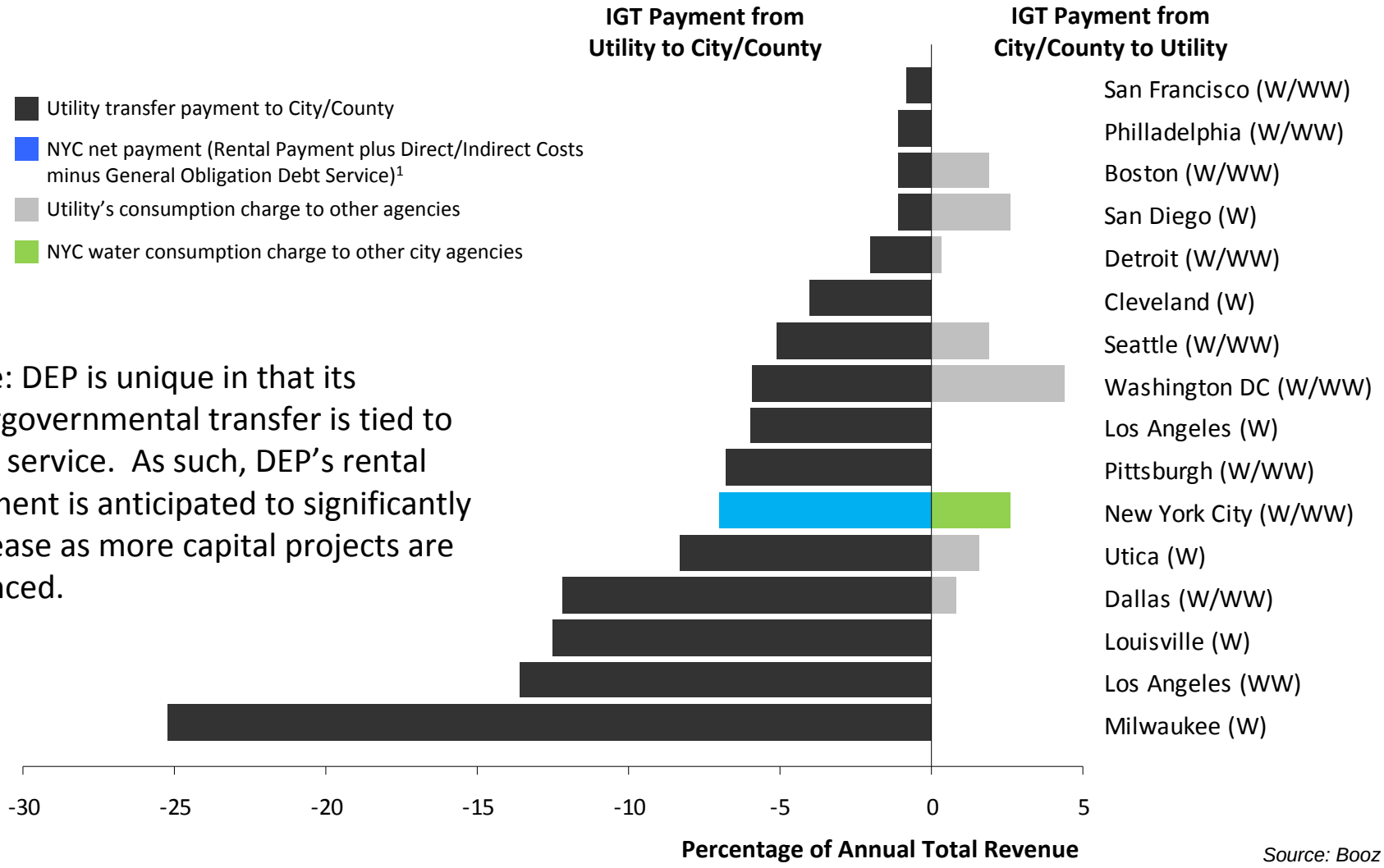
NYC's debt service as a percentage of revenue is projected to remain above average



Notes:
1. Value for NYC includes general obligation debt service.

Source: OS

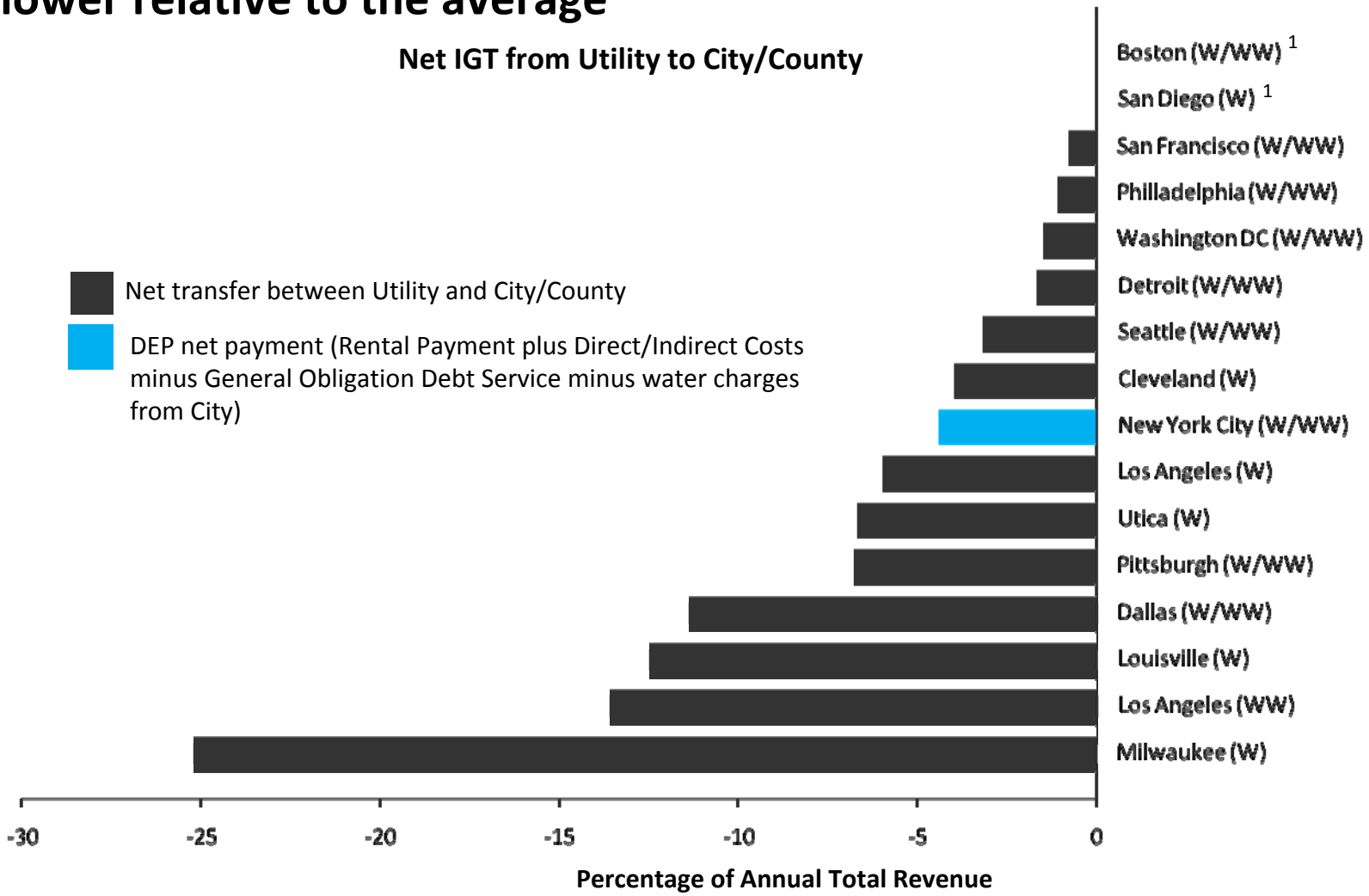
DEP's intergovernmental fund transfer, or rental payment, is average when compared to other cities (5-10% of revenue)



Note: DEP is unique in that its intergovernmental transfer is tied to debt service. As such, DEP's rental payment is anticipated to significantly increase as more capital projects are financed.

Source: Booz Allen analysis

When payments from host cities to utilities are deducted, DEP payments are even lower relative to the average



Footnote:
1. Payments from Boston & San Diego to Utility exceed Utilities' payments to their respective cities.

Source: Booz Allen analysis

On average, DEP receives more City services for its Rental Payment than most other utilities do

City	Trash Pickup	Police and Fire Dept Services	Legal	Administration	Finance	Delinquent Bill Collection (in rem)	Human Resources	Vehicle Repair/Maint.	Procurement	Budgeting	Insurance	Facility/Street	Facility	Liquidity Support	Street Pavings	Street Sweeping	Stormwater Services	Other	% of Revenues
Dallas (W/WW)	x	x	x	x	x	x	x	x	x		x	x	x					x	12.2%
Pittsburgh (W/WW)	x	x	x	x	x													x	6.8%
New York City (W/WW)	R P	R P	•	•	•		•		•	•	R P			R P		•		R P	7.0%
DCWASA (W/WW)	x	x	x	x													x		5.9%
Seattle (W/WW)	x	x	x	x				x						x				x	5.1%
Niagara Falls (W/WW)	x	x				x		x										x	2.8%
Boston (W/WW)	x	x				x						x			x				1.1%
San Francisco (W/WW)	x	x																	0.8%
Milwaukee (W)	x	x	x	x	x		x	x	x		x	x	x		x			x	25.2%
Louisville (W)	x	x																x	12.5%
Buffalo (W)	x	x	x	x	x		x		x	x								x	11.5%
Utica (W)	x	x				x													8.3%
Cleveland (W)	x	x	x	x	x														4.0%
San Diego (W)	x	x	x	x	x					x								x	1.1%
Los Angeles (WW)	x	x	x	x	x		x			x								x	13.6%

X = Service provided • = Direct / indirect cost RP = Rental Payment

Source: Booz Allen analysis

Phase 2: Rate Structure Analyses

Alternative Rate Structures Evaluated

- Based on industry evaluation, four alternative rate structures were identified, all of which meet the following criteria:
  - Commonly and successfully employed by other municipalities
  - Potential for improved financial stability, equity, water conservation, or stormwater management
- The four alternative rate structures identified are:

1. **Fixed Charges**
2. **Stormwater Charges**
3. **New Development Charges**
4. **Water Conservation Charges**

Fixed Charges

Fixed Charges

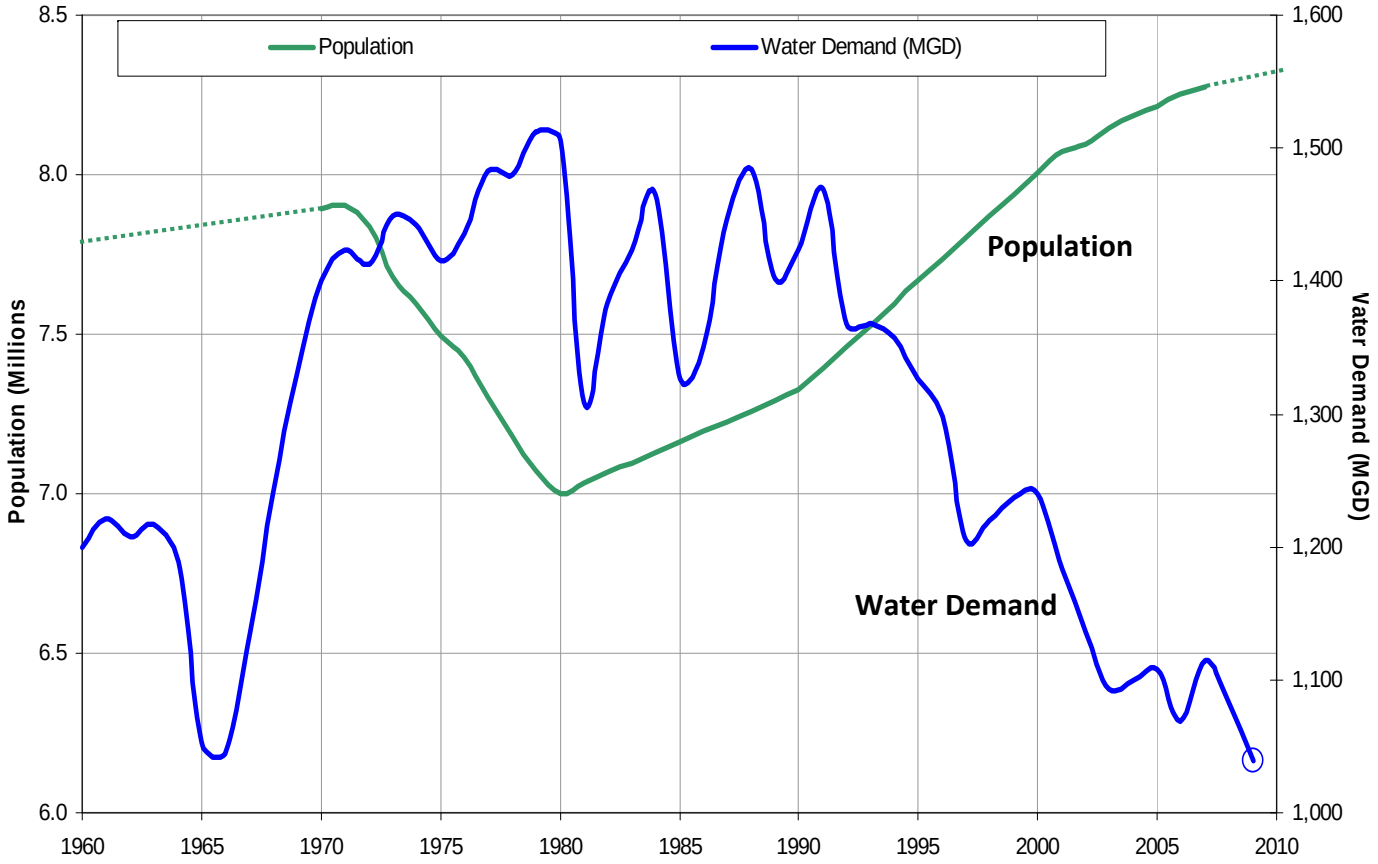
- Fixed charges remain constant, regardless of a customer's water consumption volume.
- Fixed charges are used to recover fixed expenditures. Many of these costs are rising independent of customer use.

Phase 1 Benchmarking Results

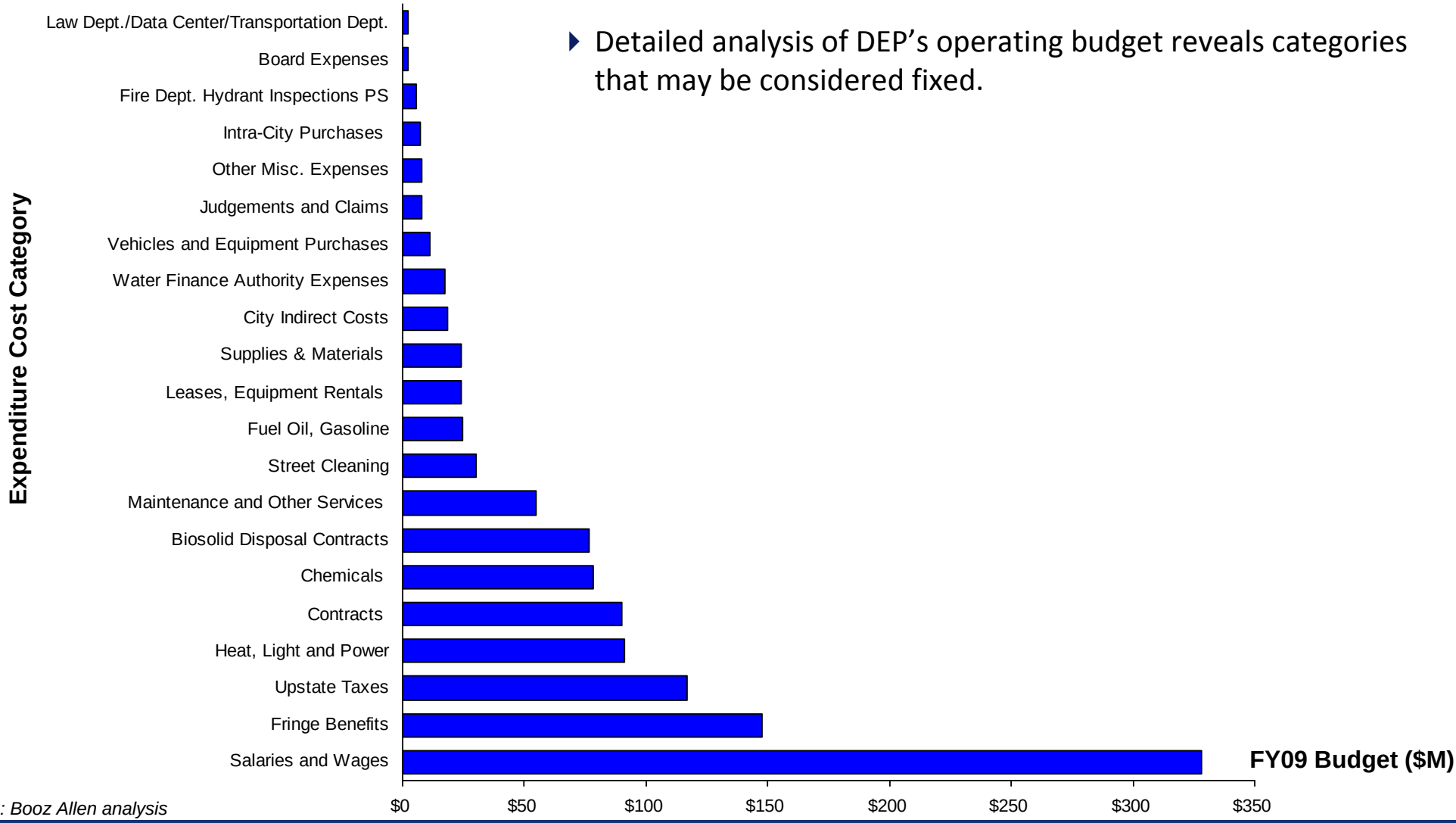
- Fixed charges reflect the cost of maintaining, replacing and building infrastructure as well as customer service costs.
- 75-percent of large U.S. cities surveyed utilize some form of fixed charge as part of their water utility rate structure.
- Fixed charges per account can be formulated based on a per housing unit charge or based on meter size.
- The percentage of revenue requirements that are recovered from fixed charges varies widely among utilities; some account for as much as 25% of overall annual revenue.
- Fixed charges are not only used by water utilities but are common among other service companies, including electric, telephone and cable.

Fixed Charges – Analyses

- Overall demand for potable water from DEP has been decreasing over the past 20 years. Fixed charges can significantly improve revenue stability as they are a more predictable source of revenue and have a moderating effect on rate increases.



Fixed Charges – Analyses: DEP Operating Budget



- Detailed analysis of DEP's operating budget reveals categories that may be considered fixed.

Source: Booz Allen analysis

Fixed Charges – Analyses

- An analysis of DEP's budget reveals several categories, or types of expenditures, that are independent of consumption volume and may be recovered through fixed charges.

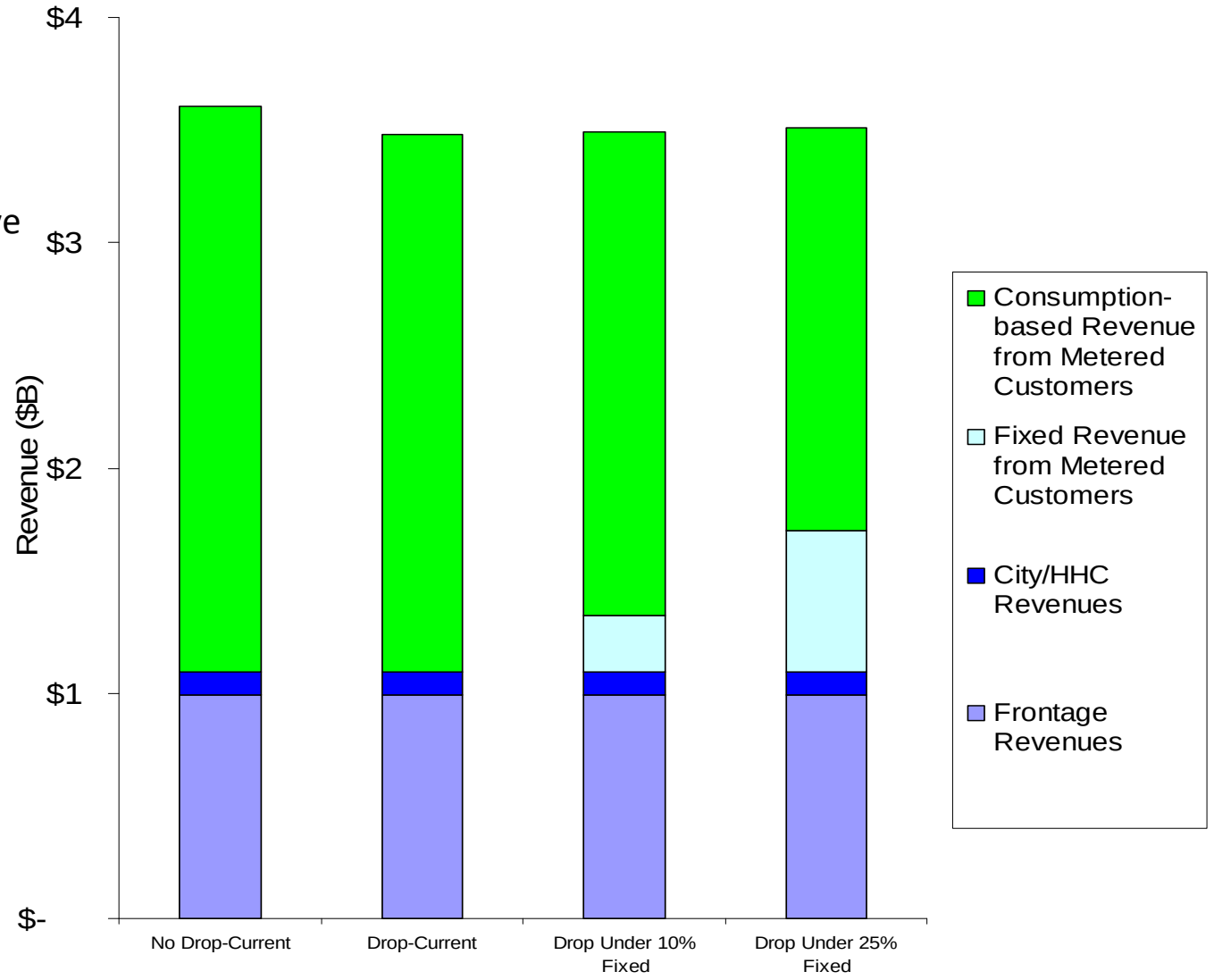
Fixed Components within DEP Annual Budget (FY09)	Percent	Cumulative %
Customer Service (Meter reading, billing/ collections, meter maintenance/repair)	2.2%	2.2%
Upstate Taxes	4.3%	6.5%
Indirect Costs paid to the City	0.7%	7.2%
Debt Service	41%*	48.2%*

* Exceeds typical percent of costs recovered through fixed charges

Source: Booz Allen analysis

Fixed Charges – Analyses

- Assuming a 5-percent drop in consumption, a fixed charge component would help improve long-term revenue stability.



Source: Booz Allen analysis

Fixed Charges – Additional Considerations

- The percentage of DEP's expenditures recovered through fixed charges would have varying levels of impact among customers. A fixed rate percentage of 10-percent of overall revenue can help with revenue stability without creating substantial disparities among customer classes; however, larger percentages will have greater long-term benefits on revenue stability and could lead to more moderate rate increases.
- Adoption of fixed charges should consider timing with respect to new billing system and AMR rollout.
- Charges can be based on number of housing units; meter size, consumption-based factors or a combination of techniques.

Stormwater Rates

Stormwater Rates

- Stormwater costs at DEP are primarily recovered through wastewater fees, which are calculated as 159-percent of drinking water fees (i.e., based on consumption). Little correlation exists between potable water consumption and how much stormwater a property generates.

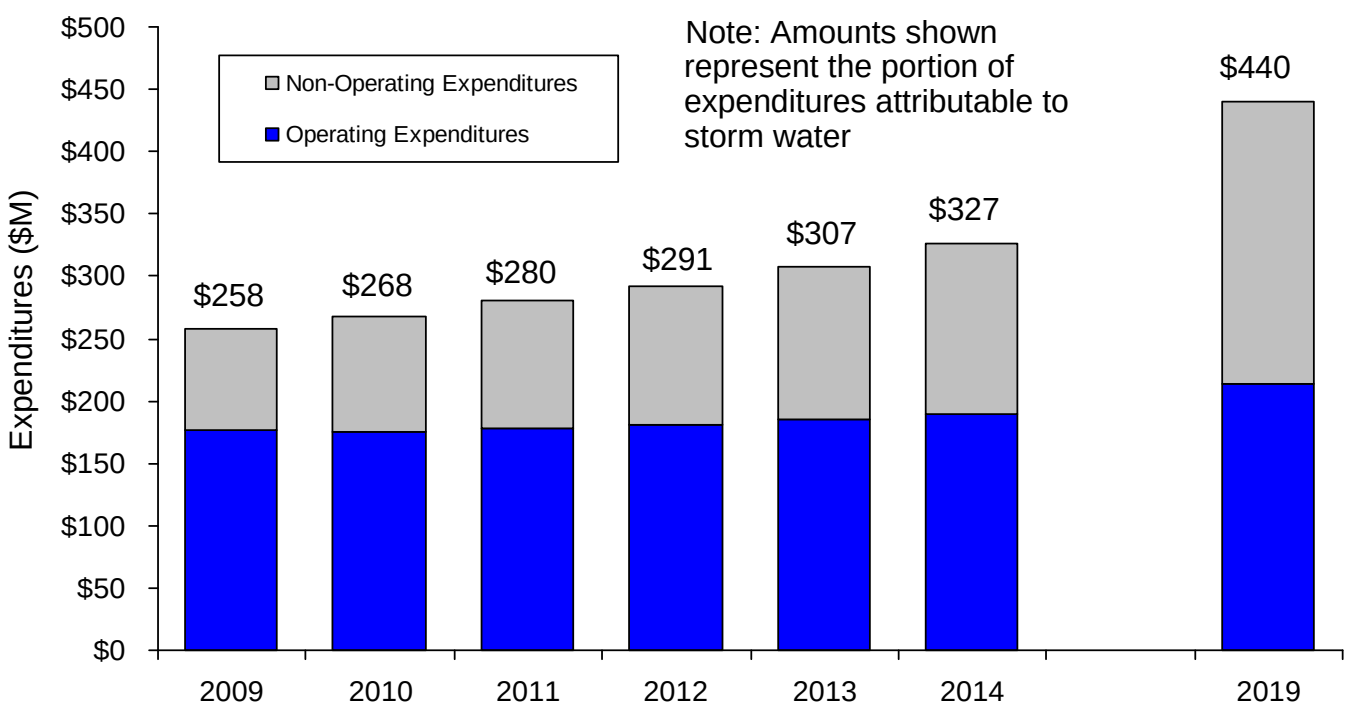
Phase 1 Benchmarking Results

- Stormwater rate structures are increasingly being applied by water utilities; over 500 utilities currently apply stormwater charges including Philadelphia, Washington DC, San Antonio, Milwaukee and Detroit. Implementation of stormwater rates is typically a multi-year process.

- 65% of surveyed utilities with stormwater charges use impervious area as the basis for determining fees. The increased capabilities of geographic information systems (GIS) has increased the ability for utilities to assess charges based on impervious area.

Stormwater Rates – Analyses

- A minimum of 10-percent of DEP's annual expenditures can be attributed to stormwater.
- Initially, two-thirds of stormwater revenue requirements would be due to operating expenses. Between 2009 and 2019, operating expenditures allocated to stormwater increase by 21%, while non-operating expenditures (e.g., capital costs) increase substantially more.



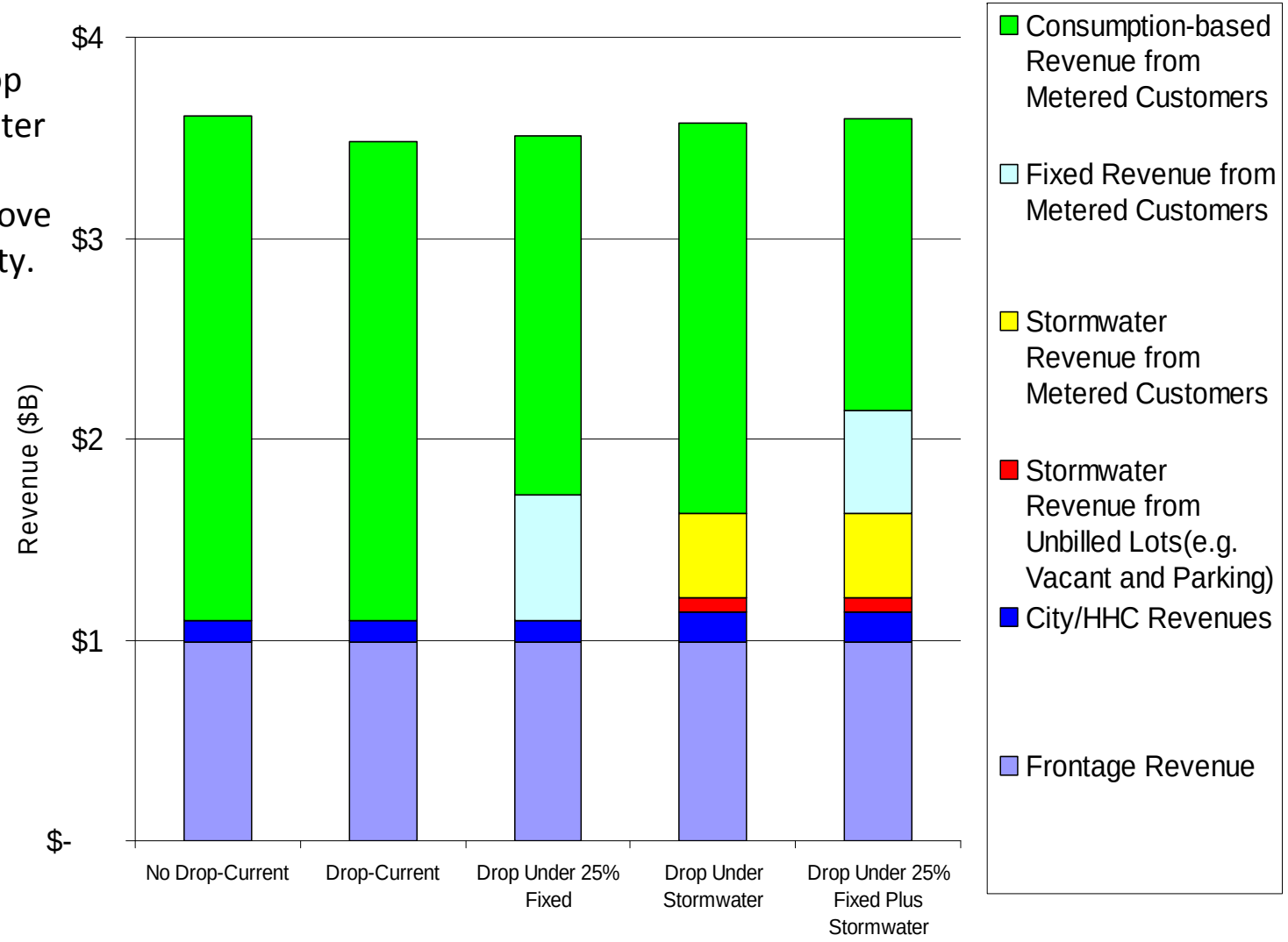
Source: Booz Allen analysis

Stormwater Rates – Analyses

- Different rates may be applied among properties based on square footage of impervious area.
- The distribution of charges among customers shifts more toward those with low population densities (square feet per capita). These typically include single family dwellings, industrial, and manufacturing. Conversely, multi-family, mixed residential/commercial, and office buildings may see decreases in their bills due to relatively higher population densities.
- Many parking lots and vacant lots are currently unbilled however generate substantial amounts of stormwater.

Stormwater Rates – Analyses

- Assuming a 5-percent drop in consumption, stormwater charges, like other fixed charges, would help improve long-term revenue stability.



Source: Booz Allen analysis

Stormwater Rates – Additional Considerations

- The adoption of stormwater rates will encourage the use and development of stormwater Best Management Practices (BMPs) only if it is coupled with a stormwater credit program.
- Stormwater rate structures, like fixed charges, improve revenue stability, however they can be difficult to administer because of technical and data constraints.
- Reallocation of capital/operating costs and budgets would be required to track stormwater-related expenditures. Also, new billing system must be in place in order to fully implement a City-wide stormwater rate structure and credit program.

New Development Charges

New Development Charges

- New development charges recover a portion of the amount of infrastructure investment made to support growth. DEP does not currently apply such charges.
- Costs recovered may include engineering, design and construction of new capacity-related capital assets and replacement of existing assets.
- Often used in more suburban areas; more difficult to separate out new from existing infrastructure in densely developed urban areas.

Phase 1 Benchmarking Results

- Many large cities surveyed assess new development charges (e.g., San Francisco, Seattle, San Diego, Denver, Los Angeles, Chicago), and it is most widely used in growth areas. It was found that the percentage of overall utility revenue ranged from 0.6 to 3.1%, however Denver recovered 9.1% of its budget from such charges. Charges ranged from $500 to $8,000 for water for a single family home, and $1,000 to $6,000 for wastewater.
- Charges typically vary by meter size, square footage, or number of fixtures.
- Charges may differ by type of customer (e.g., residential, multi-residential, commercial).

New Development Charges – Analyses

- Two methods for determining new development charges:
  - **Next Increment of Investment:** New development pays for future investments needed to accommodate new development. Most applicable to suburban developments with additional capacity needs.
  - **System Buy-In:** Users who create new or additional demand on existing systems fairly compensate existing customers for previous investments in infrastructure. Applicable to urban environments with capacity.
- New development charges will provide additional revenue; however the overall amount depends on economic conditions.

New Development Charges – Analyses

- **System Buy-In Approach:** New development charges are based on calculating offsetting investments made by existing customers in the current water and wastewater system since 1987, including WFA debt service, general obligation debt service and PAYGO capital.

ILLUSTRATION: SYSTEM BUY-IN APPROACH

Cost Breakdown by Service

	Historical Capital Expenditure	Historical Debt Service + Paygo (billions $)[1]	Cost/ Gallon[2]
Water	16%	$2.3	$1.78
Water Mains	23%	$3.2	$2.49
Sewer	18%	$2.6	$1.98
W. Pollution Control	43%	$6.1	$4.70
Total	**100%**	**$14.1**	**$10.94**

Charge by Development Type

Development Type	Cost / Gallon	Consumption[3] (gpd/HU)	New Development Charge (Per Unit)
Single Family	$11	255	**$2,800**
2-3 Family	$11	191	**$2,100**
Multi-Family	$11	140	**$1,540**

The cost of buying into existing system capacity is calculated at approximately $11 per gallon.

Footnotes:
1. Includes DS on Authority bonds, GO debt service since 1987, and Paygo used as capital.
2. Based on city-wide capacity of 1,290-mgd system.
3. Based on consumption in post-1996 buildings.

Source: Booz Allen analysis

New Development Charges – Additional Considerations

- Charges result in relatively unstable revenue since charges are tied to fluctuations in the real estate construction market.
- Procedures would need to be developed for assessing and processing payments.
- Special conditions may need to be considered for affordable housing, government, and non-profits.

Water Conservation Rates

Water Conservation Rates

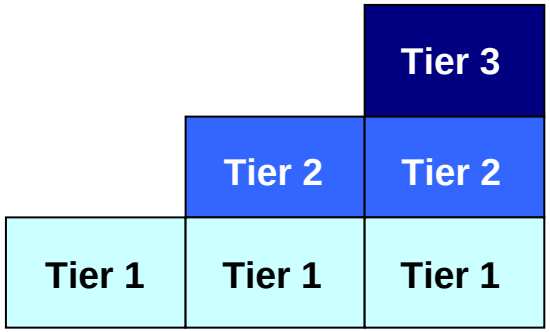
- Water conservation charges send price signals to customers that clean water is a limited, valuable commodity and should be used wisely. Fortunately NYC has a plentiful water supply, however conservation charges may be used for periods when aqueducts are under major repair, during droughts, or to reduce flows to wastewater plants.
- Conservation rate structures include: inclining block; excess use charges; and uniform rates.
  - Inclining Block (Tiered) Rate: Higher levels of usage are charged more on a per unit basis
  - Excess Use Charges: Usage above a defined allowance is charged a higher rate

Phase 1 Benchmarking Results

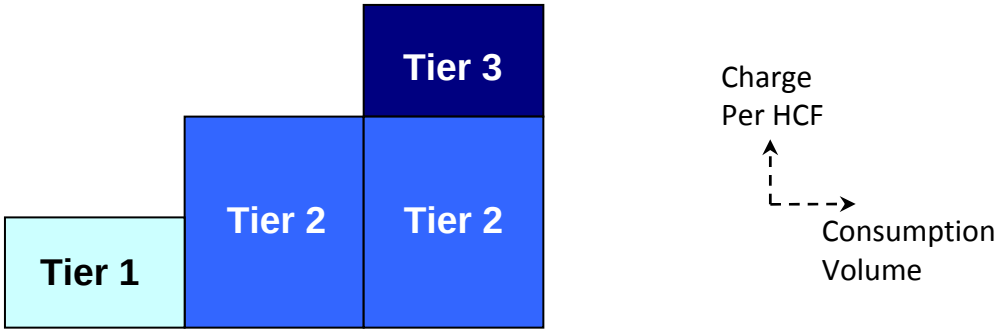
- Water utilities in larger cities employ mostly uniform or inclining rate structures. More than 1/3 of the 24 largest city water utilities surveyed reveal that an inclining block structure is used for at least one customer class. Among wastewater utilities, a uniform structure is most often used. Excess use charges are typically targeted toward non-residential customers.
- There has been an increasing reliance nationwide on inclining rates over the past 10 years. Inclining rates and excess use charges encourage water conservation and have been proven effective in areas particularly prone to water shortages (e.g., southwestern U.S.).

Water Conservation Rates – Analyses

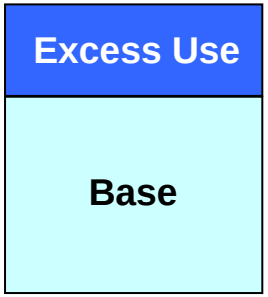
ILLUSTRATION:
INCLINING BLOCK AND EXCESS USE CHARGES



Option 1: Inclining Block (Residential)



Option 2: Inclining Block (Residential)



Approaches for determining excess charge:
- Customer's prior use
- Usage across similar customers
- Winter average, with additional summer usage billed as excess.

Option 3: Excess Use Rate (Non-Residential)

Water Conservation Rates – Analyses

- Over time, the top tier or excess use may diminish significantly as customers install conservation measures. Volatility can be mitigated by:
  - Ensuring that top tier or excess use charges represent a relatively small percent of revenue (in these examples, 13%-16%).
  - Creating a water conservation reserve fund from excess revenue when top tier/excess usage exceeds predictions and drawn down when top tier usage is less than predicted.
- May want to set aside top tier or excess use as revenue enhancement.

	Water Unit Rate ($/hcf)	Billed Metered Customer Total Revenue	% of Revenue
Option 1 (Residential)			
Tier 1	$2.14	$818,514,312	69%
Tier 2	$2.38	$184,139,682	16%
Tier 3	$3.38	$185,136,168	16%
Option 2 (Residential)			
Tier 1	$2.14	$369,477,711	31%
Tier 2	$2.30	$660,108,928	56%
Tier 3	$2.90	$158,844,642	13%
Option 3 (Non-Residential)			
Base Use	$2.21	$450,246,788	84%
Excess Use	$3.00	$87,361,317	16%

Source: Booz Allen analysis

Water Conservation Rates – Additional Considerations

- Although water conservation rates are used in many cities that do not have submetering for multifamily apartments, lack of submetering can reduce the effectiveness of price signals associated with inclining block rate structures.
- Administrative Challenges:
  - Implement new AMR and billing system
  - Perform further detailed analyses of tiers and excess use shift points to support policy decisions
  - Establish mechanisms to avoid revenue instability (e.g., reserve fund)
  - Develop customer outreach program

Timeline & Next Steps

Rate Structure Design Timeframe

- Stakeholder briefings with participation of Board Members (beginning Wk of 1/4)
- Incorporate stakeholder and public feedback (1/10 – 2/10)
- Present implementation plan (3/10)
- Propose FY ’11 rate (4/10)
- Borough Rate hearings (4/10)
- Board vote on FY ’11 rate (5/10)
- Implementation of rate structure changes must take into account the following:
  - billing system modifications
  - formula analysis for charges
  - procedures
  - data collection and due diligence
  - budget allocations
  - customer outreach
  - legal research
- Decisions about rate structure changes need to be considered within a larger framework
  - New billing system development [2011]
  - AMR [substantial completion 2011]