



## The Operational Excellence (OpX) program: an innovative model of partnership

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NACWA

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- **DEP and OpX**
- The approach
- Results



## ❖ Supply 1 billion gallons of water per day to 9 million New Yorkers

- ❖ 19 storage reservoirs and 3 controlled lakes
- ❖ 550,000 water quality tests per year
- ❖ 295 miles of aqueduct and tunnels
- ❖ 7,000 miles of water mains
- ❖ 56 shaft sites; 500 pressure regulators; 3 pump stations
- ❖ 109,000 fire hydrants

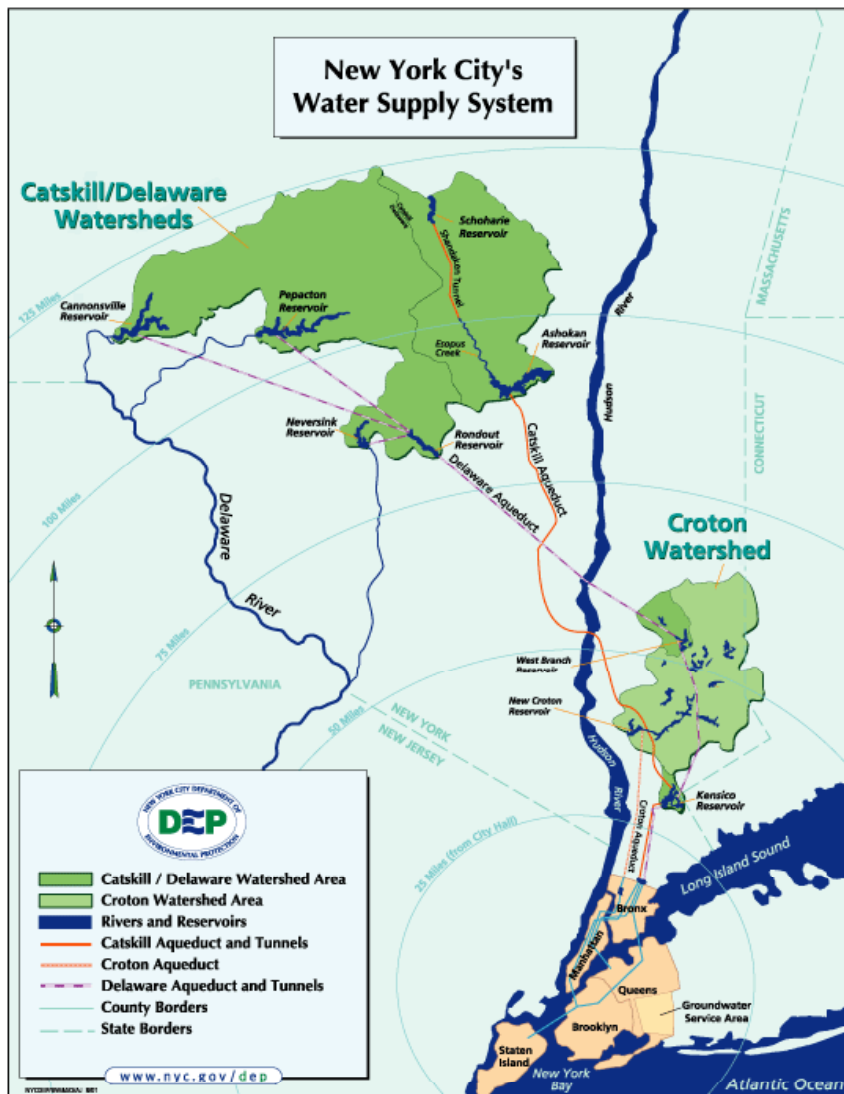
## ❖ Treat 1.3 billion gallons of wastewater per day

- ❖ 14 In-city treatment plants; 8 upstate
- ❖ 7,400 miles of sewer: 3,337 miles of combined, 2,271 separated
- ❖ 157,000 street segments of sewer
- ❖ 490 regulators (104 telemetered), 96 pump stations
- ❖ 144,000 catch basins

## ❖ \$14 billion in active construction & design projects

## ❖ Air Quality, Hazmat, Emergency Response, & Noise

# Water Supply & Wastewater



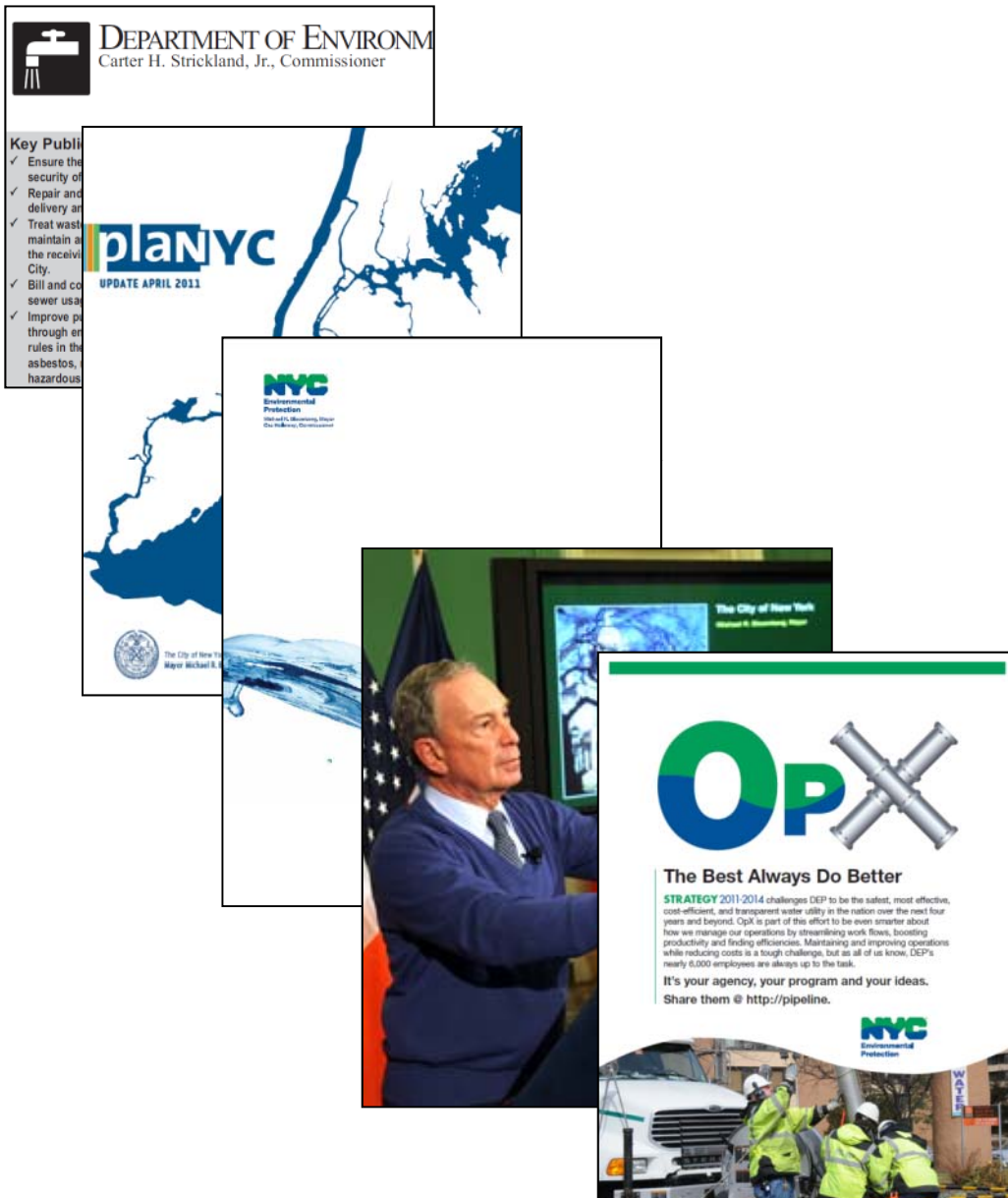
Plant Location	Capacity (MGD)
North River	170
Wards Island	275
Hunts Point	200
Newtown Creek	310
Red Hook	60
26th Ward	85
Owls Head	120
Coney Island	110
Bowery Bay	150
Tallmans Island	80
Jamaica	100
Rockaway	45
Port Richmond	60
Oakwood Beach	40

● Wastewater Treatment Plants  
 ~ Community Board Boundaries



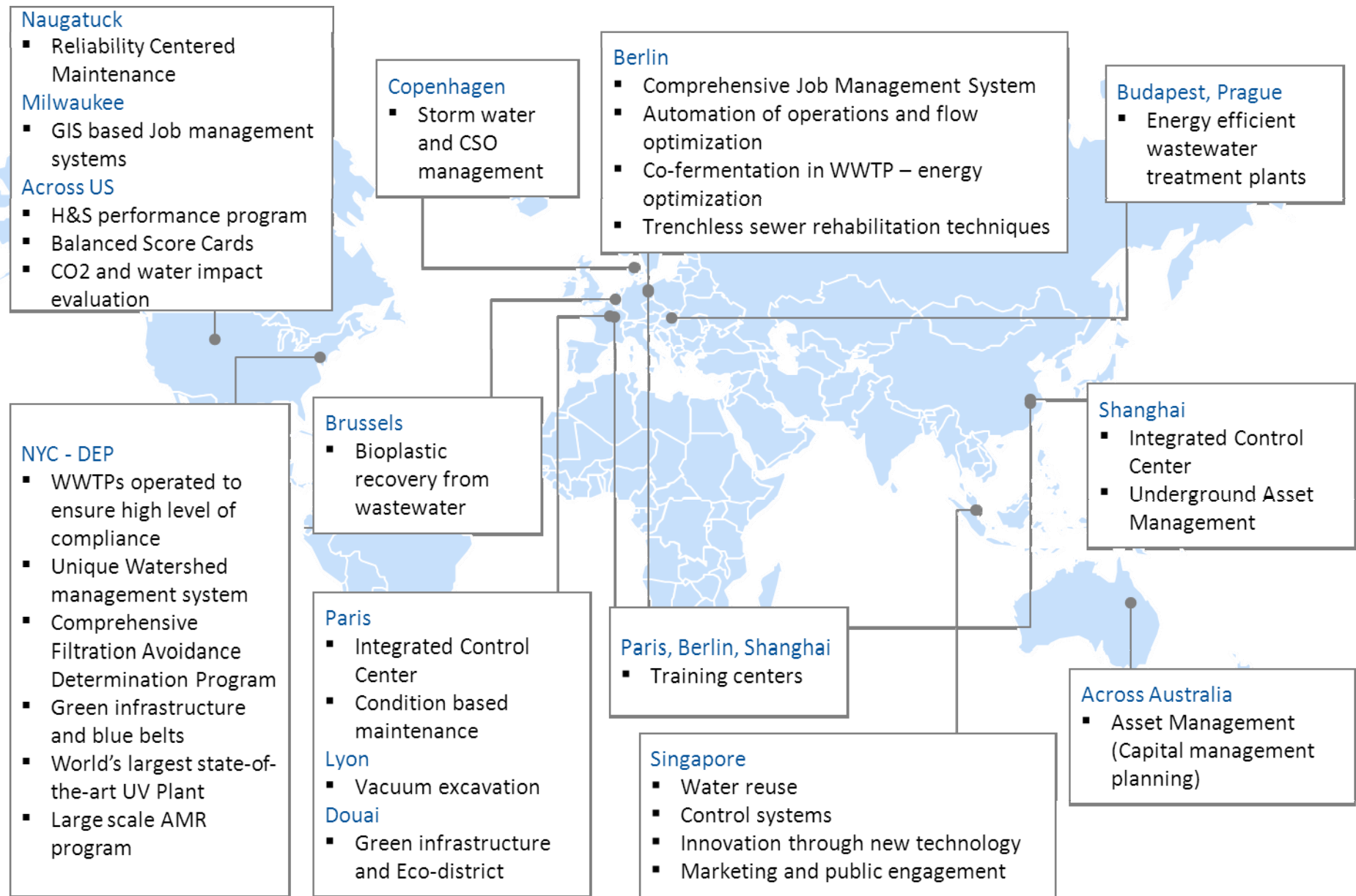


# Well engaged Strategic Initiatives at NYC's and DEP's levels

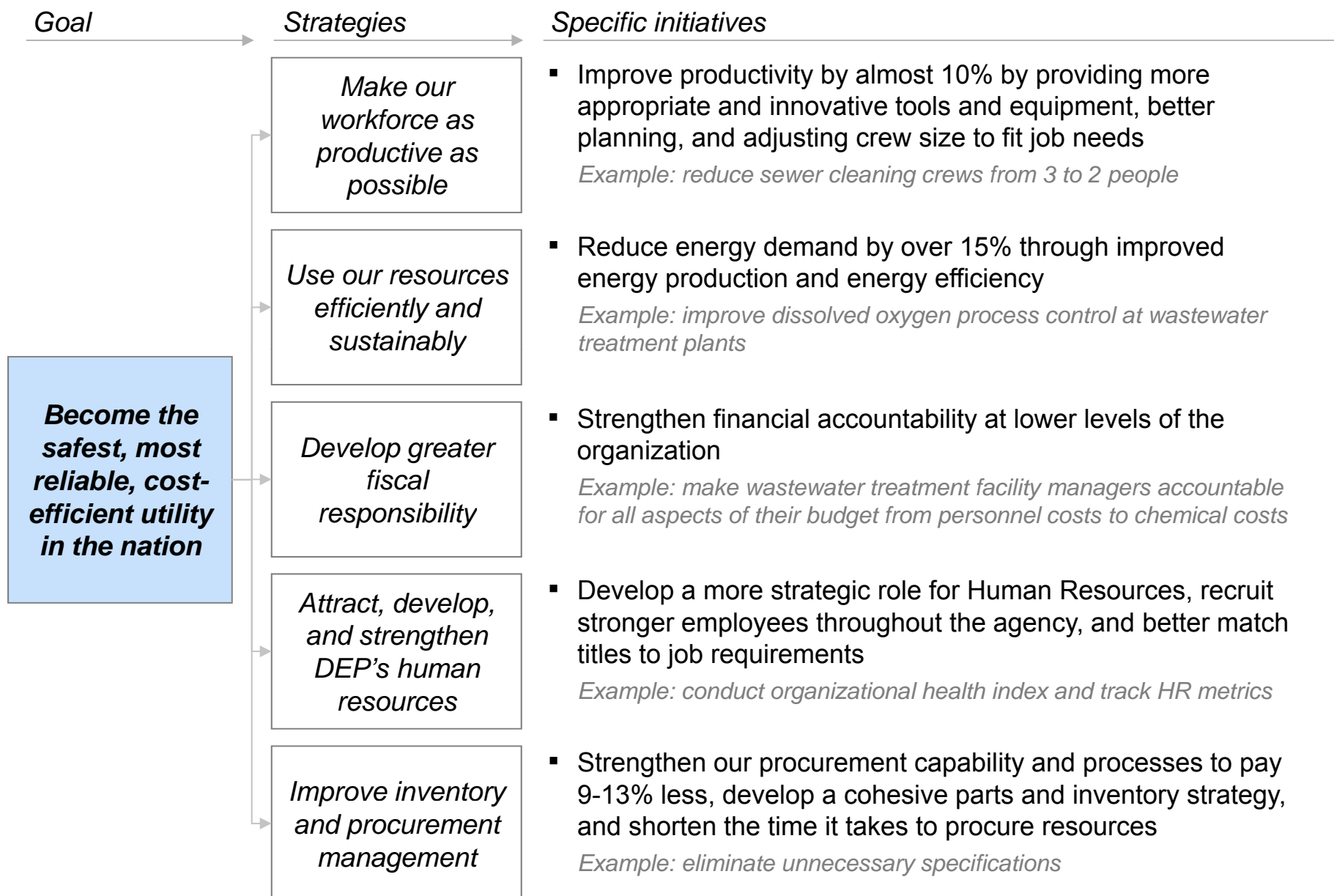


- NYC has ushered in a business approach to governing that is a world-wide model
- Goal is to deliver **high value** to current and future New Yorkers, consisting of **superior performance** at an **affordable price**
- MMR, 311, PlaNYC, Strategy 2011-14, and H2O Stat, all explain and demand accountability for delivering services of a world-class city
- Budgets, rate, and investments in assets demonstrate fiscal stewardship
- OpX is part of the effort “to ensure the efficient and cost-effective operation of the water system” and to “innovate and implement best practices ... around the country and the world” (Strategy, Initiatives 1 & 2)

# Realizing that DEP is part of a worldwide network of water utilities where best practices can be shared



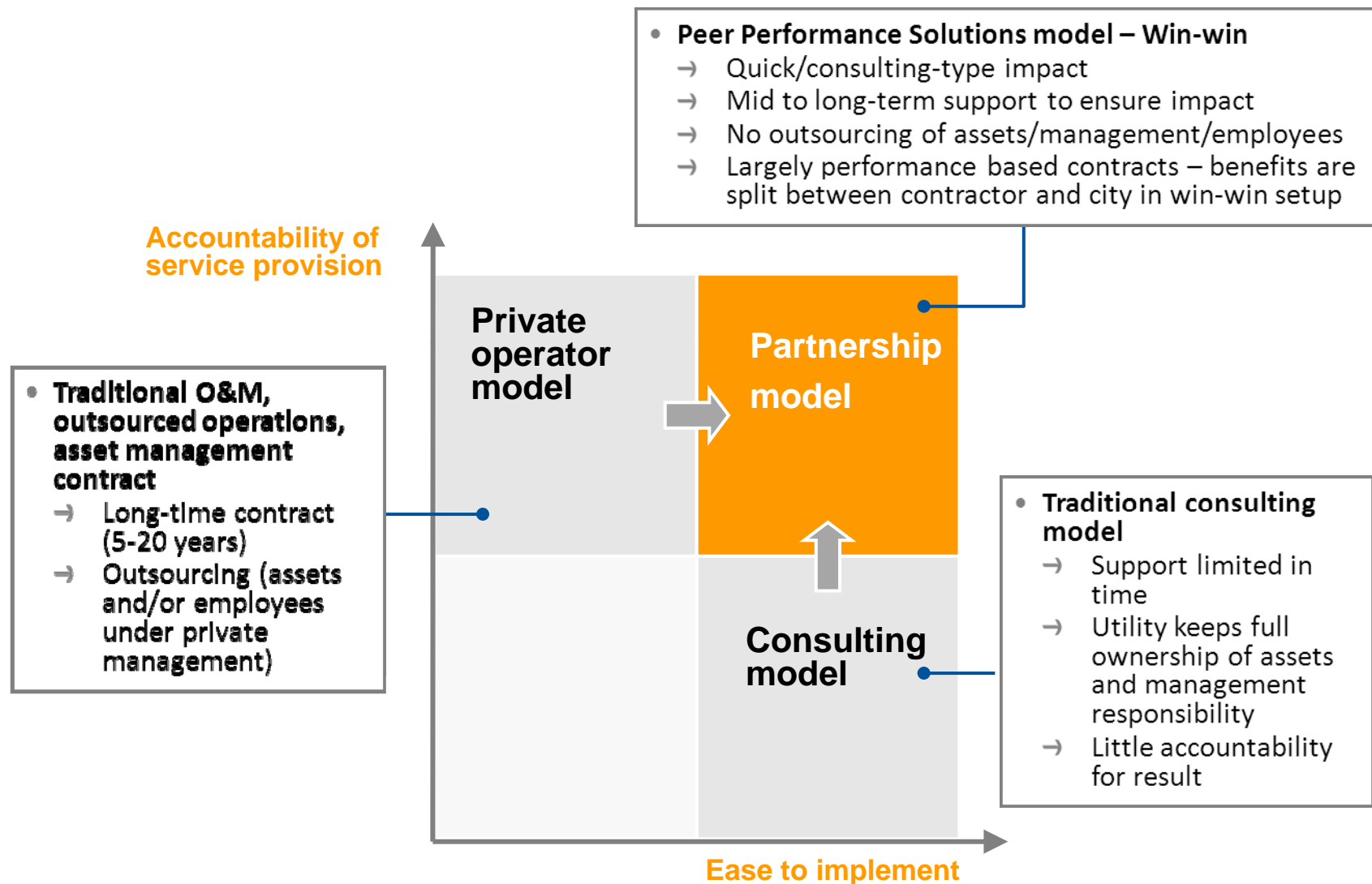
# Ambition: Engaging into a structural transformation



- DEP and OpX
- **The approach**
- Results



# A new form of partnership (1/2)



- **Concept:** getting access through the private sector to global best practices thanks to a performance-based consulting contract
- **DEP keeps full control** of its operation and decides which initiatives to undertake or not
- Compensation structure of shared savings ensures **alignment of the interests of** DEP and the private consultant.
- Structured into **2 phases**:
  - Phase 1: initial identification of potential and implementation of some first quick wins
  - Phase 2: 4 years of implementation of initiatives



## Malcolm-Pirnie Arcadis

- Deep engineering experience
- Knowledge of the DEP and New York

## Veolia Water

- Water services provided to 150 million people worldwide
- 100,000 professionals
- Combination of ops, engineering, technology and R&D
- Your peer from the private sector

## McKinsey & Company

- 6,200 operational improvement projects worldwide
- Track record in New York, including completed benchmarking
- Transformation experience with leading industrials and water

## DEP and Consultants working hand in hand and sharing a common goal from day one



- Top management sharing their change story and vision in person
- Branded program
- Frequent updates via internal magazine, posters, intranet sites, etc.
- On site displays



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## Memorandum

To: All DEP Employees

From: Carter Strickland

Date: October 31, 2011

Re: Operational Excellence: The Best Always Do Better

DEP is about to embark on an exciting new program called *Operational Excellence: The Best Always Do Better*, or *OpX* for short.

When DEP released *Strategy 2011-2014* earlier this year, we committed to being the safest, most productive, cost-effective, and transparent water utility.



Michael R. Bloomberg, Mayor  
Carter Strickland, Commissioner

WEEKLY

# PIPELINE

November 7, 2011

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## Operational Excellence: The Best Always Do Better



Over the past decade, certain sports organizations always seem to be on top; think of the Los Angeles Lakers, the New England Patriots and the New York Yankees (sorry, Mets fans). They do it because they aren't content to spend their offseason admiring their own success. Instead, they follow up each season with a deep analysis of how to make the most of their talent and find ways

to improve upon their previous accomplishments. In many ways, this is what separates them from other teams, even those with comparable resources. Their shared approach to organizational management is crystal clear: The best always do better. This unofficial motto is a vital component of their culture and easily recognizable brand, and it pushes everyone within to continually perform at the highest possible level.

That same approach describes what's begun at DEP with the kickoff of *Operational Excellence: The Best Always Do Better* (OpX).

Without a doubt, DEP already runs a world-class organization, bringing some of the cleanest, best tasting water on the planet to more than nine million consumers daily; managing a highly complex distribution and collection system; and protecting New York City's waterways through a comprehensive treatment program at 14 city wastewater plants. To take this work to the next level, last February DEP laid out an ambitious strategic plan called *Strategy 2011-2014* to be the safest, most productive, cost-effective, and transparent water utility in the nation over the next four years and beyond. DEP's nearly 6,000 employees are fully behind this mission and have hit the ground running in undertaking this tough challenge; in fact, many of the 100 initiatives laid out in *Strategy 2011-2014* have already been completed. That is because DEP's staff continues to be the agency's most valuable resource. However, evolving regulations, community expectations, and absence of federal funding all present new challenges to the ways DEP implements its core functions. Similarly, the 835,000 customers who pay for these services should be asked to absorb more water rate hikes only if DEP has already done everything it can to keep costs down. Because of this reality, the goal of OpX is to be smarter about how DEP manages its operations.

find cost-saving opportunities. For example, there may be money to be saved by looking at overall energy and chemical use, insourcing work currently contracted out, or changing purchase agreements. Front-line DEP employees will provide many of the transformative ideas that will fuel this exciting new program. "For OpX to be a success, many of the best suggestions will be made by our employees, and it is our goal to help them get those ideas heard and implemented," said Commissioner Carter Strickland.



Commissioner Strickland welcomes members of OpX team.

To ensure the success of the program, the Water Board, after careful deliberation and a thorough review of several excellent options, selected Veolia Water North America to serve as a consultant for OpX. Bringing an international array of experience in water supply and wastewater operations, Veolia boasts an impressive portfolio of global best management practices.

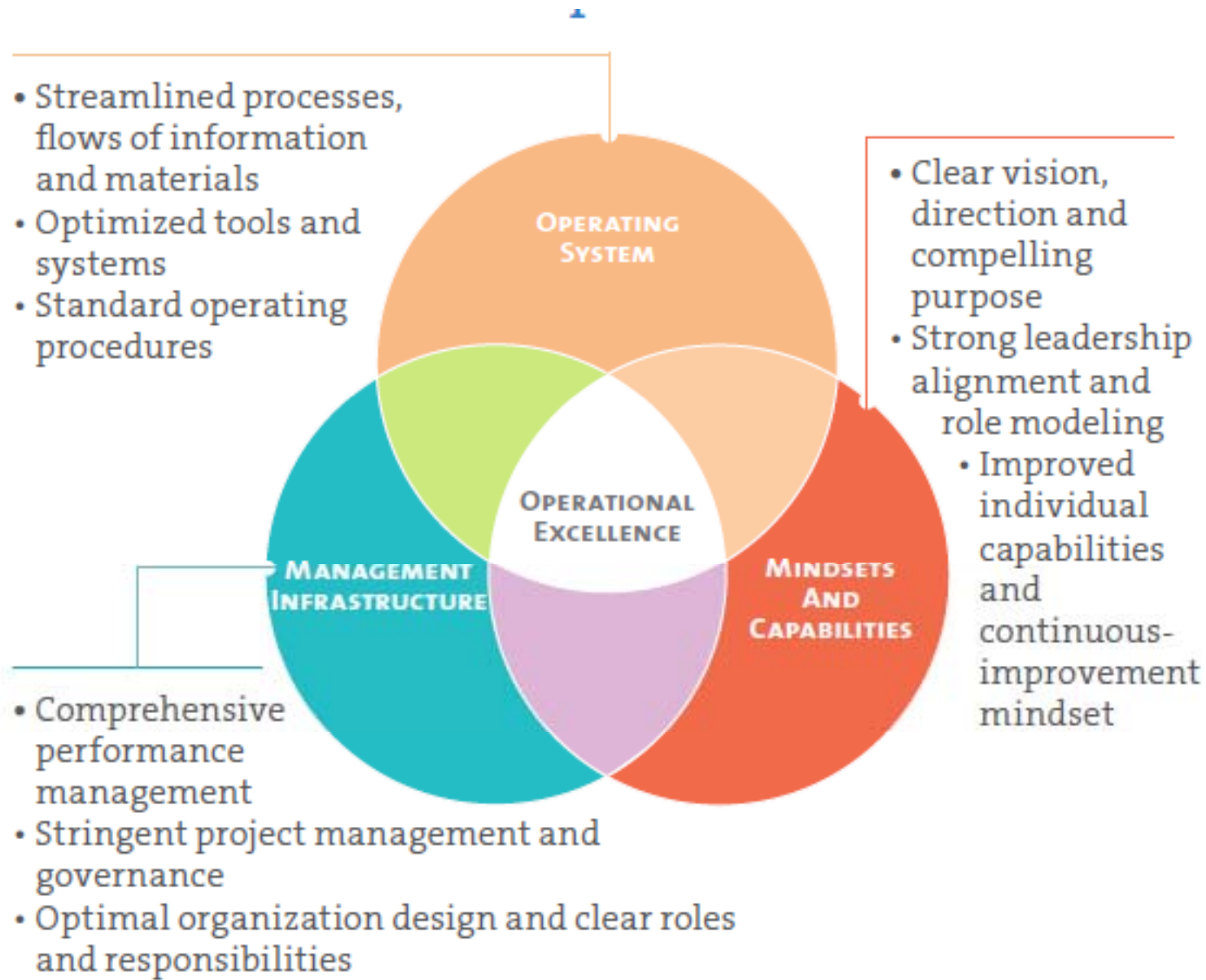
### Spotlight on Safety

**EHS Facility Assessments: The numbers speak for themselves**  
The Office of Environmental Health and Safety (OEHS) Audit team conducts approximately 85 facility audits a year. The vast majority of facilities audited this year continue to show measurable improvements in their EHS compliance profiles. On average, the number of EHS audit findings has decreased anywhere from 10% to 100% from their prior EHS audits. Audits are conducted every

upgraded in 1998 and has a peak load capacity of 1.25 million gallons per day. Although the peak load capacity is significantly smaller than the in-city plants, Pine Hill serves a critical role in protecting the upstate watershed. The plant discharges via a NYS-permitted outfall into Birch Creek. Twenty-five EHS findings were identified in Pine Hill's first EHS compliance audit. In each sub-



## Structured approach: addressing all elements of excellence



# Structured approach: top-down analysis benchmarking & transparency

**BWS**



**BWT**



**BWSO**



Central Functions

**Chemical cost** is close to best practice

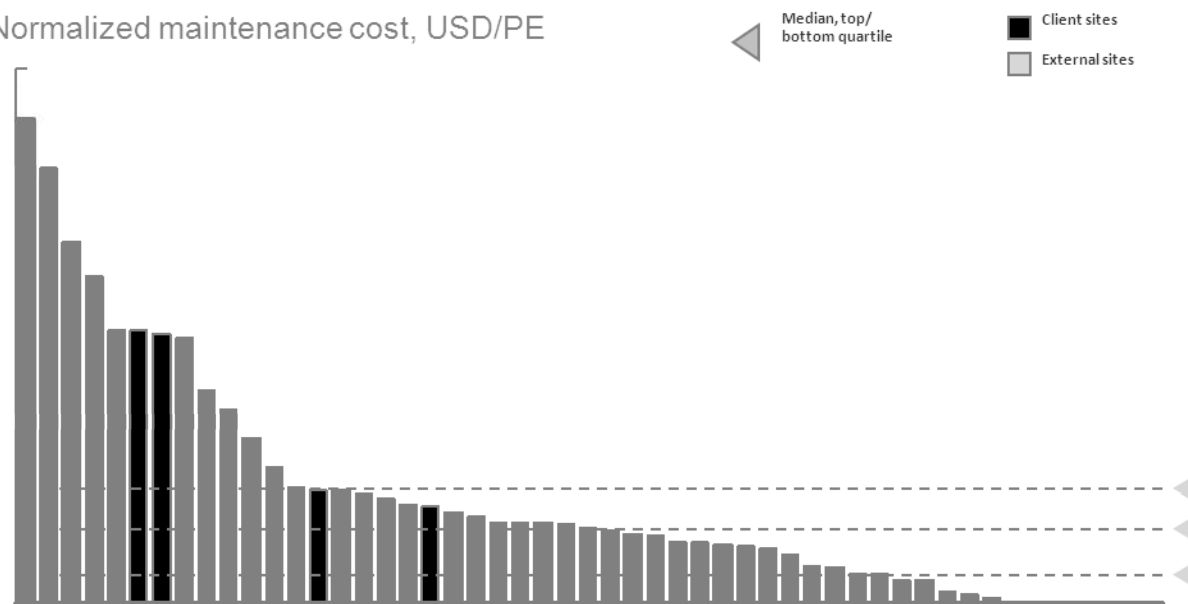
**Site operating costs**

**Energy use** is above average

**Maintenance cost** is better than average

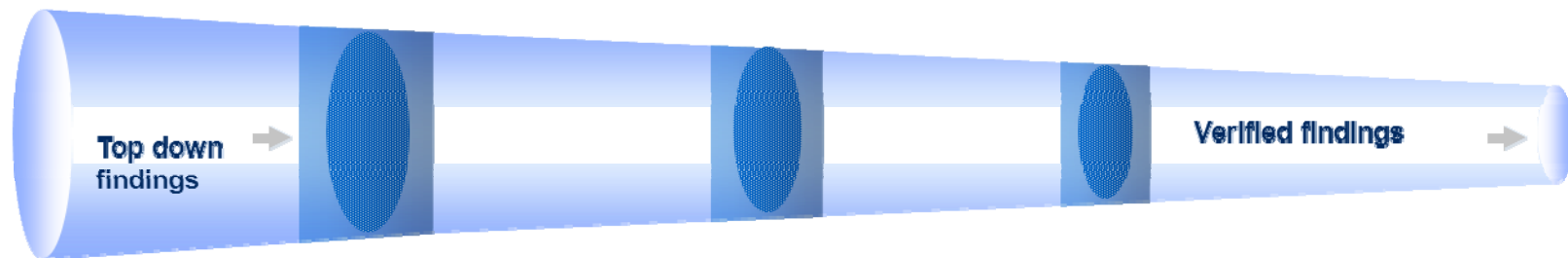
**Maintenance cost** varies between plants by a factor of two

Normalized maintenance cost, USD/PE



- Preliminary benchmarking
- Qualitative expert assessments to align on improvement areas

# Structured approach: bottom-up validation



**Onsite diagnostic**

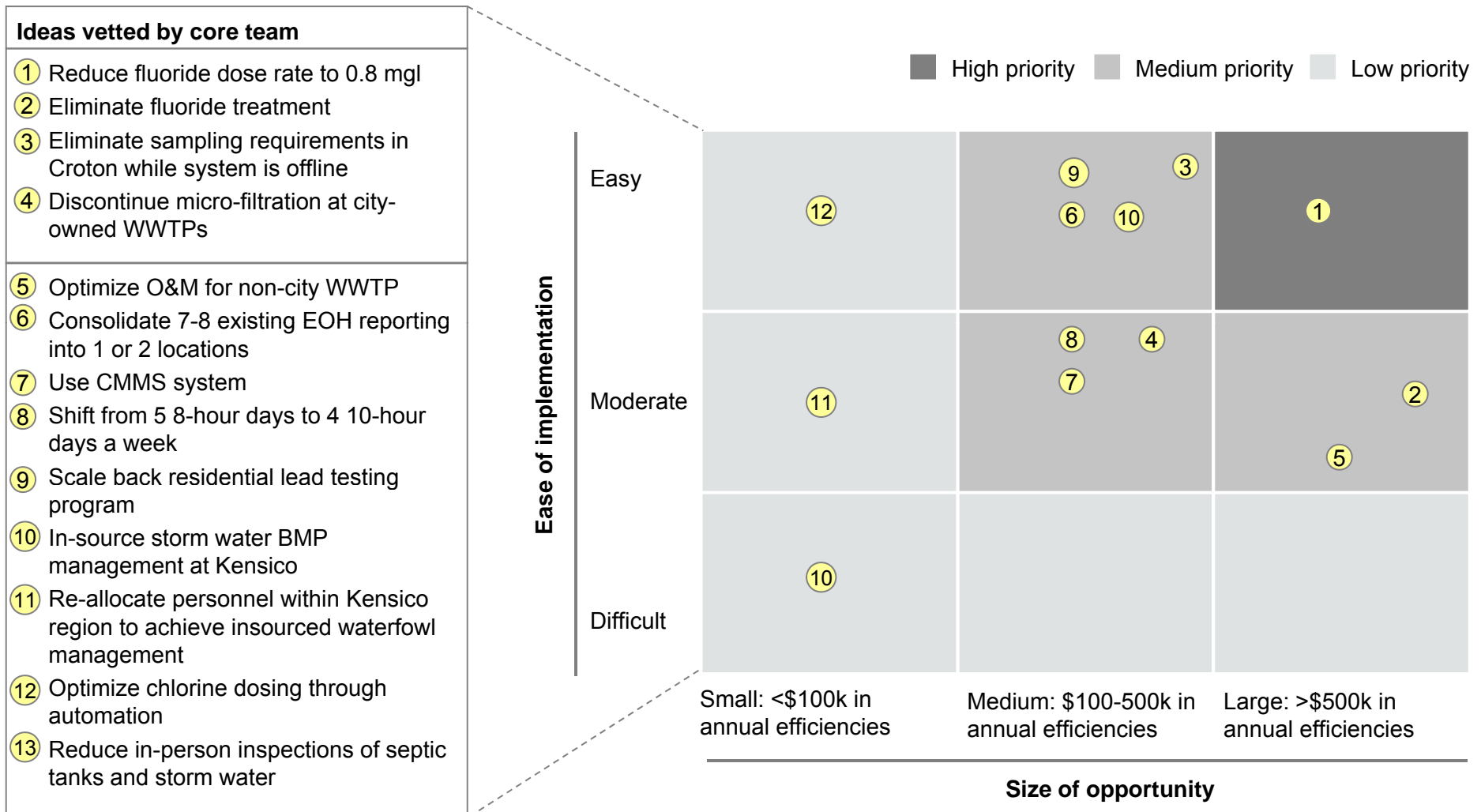
**Manager and frontline  
operator engagement**

**Fact-based  
analysis**

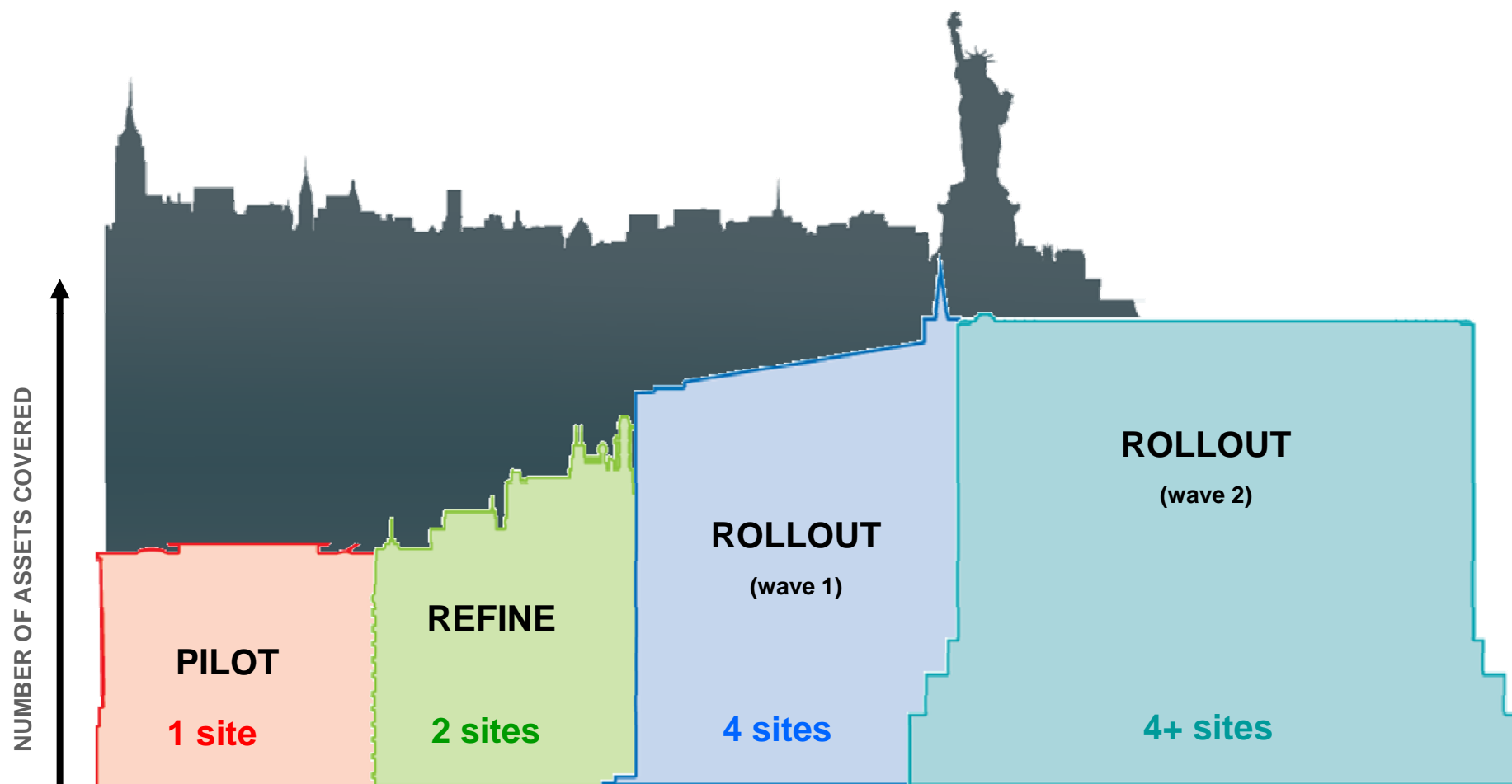


# Structured approach: prioritization

EXAMPLE BWS



# Structured approach: build momentum and achieve scale





- DEP and OpX
- The approach
- **Results**

## Phase 1: actions and findings

- ❖ The six-month diagnostic Phase 1 included full analysis of improvement opportunities available to DEP; \$5M in annual savings already implemented

### What we did in Phase 1

- Performed site assessment of treatment plants, pump stations, reservoirs, repair yards, etc.
- Observed ~800 person-hours of work
- Reviewed more than 35 contracts
- Conducted negotiation training for DEP and DCAS staff
- Ran analysis of ~15,300 meters
- Conducted interviews and workshops with leadership, supervisors, and field staff

### Already implemented initiatives

- Chemical usage reduction
- Manual control of aeration
- Chemical cost renegotiation with incumbent vendors

### Main initiatives to be addressed in Phase 2

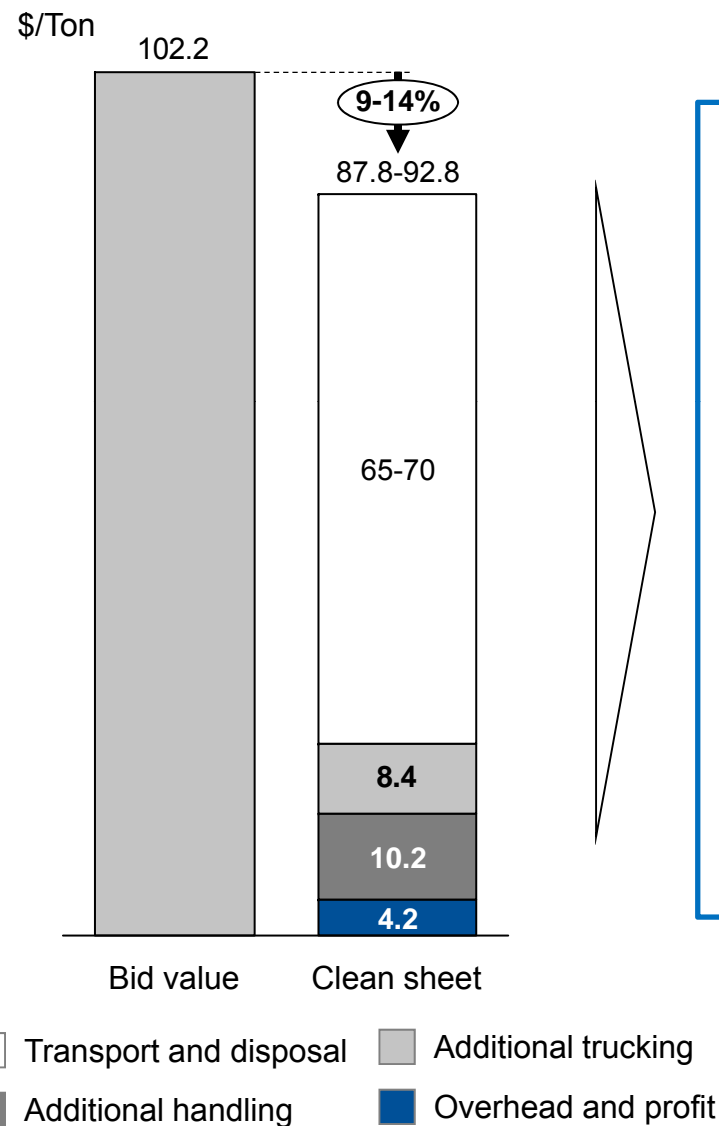
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|--|--|
| <ul style="list-style-type: none"><li>▪ Use resources and materials efficiently and sustainably (e.g., lower energy consumption, increase energy generation and reduce the volume of sludge transported for disposal)</li><li>▪ Improve procurement process to ensure DEP pays the best price for goods and services</li><li>▪ Help DEP's workforce become more effective (e.g., through improved scheduling and equipment availability)</li></ul> | <ul style="list-style-type: none"><li>▪ Improve revenue for services rendered (e.g., expand large meter replacement program)</li><li>▪ Strengthen performance management and metrics across the organization</li><li>▪ Invest in attracting, developing and retaining talent</li></ul> |
|--|--|

# Procurement example: Clean-sheet cost estimate for the residuals removal contract is 9-14% lower than current price paid

## Assumptions

- **Transport to and disposal at landfill**
  - Transport from the transfer facility in Queens and disposal at landfill is equivalent to transport and disposal from DEP's own transfer facility at Wards Island
  - Wards Island transport and disposal cost is \$69.50/ton (on a separate contract; also with Tully)
- **Additional trucking from DEP plants to transfer facility includes:**
  - Capital, depreciation and licensing cost of trucks in NYC
  - Truck fuel and maintenance costs
  - Labor costs based on union rates
- **Additional handling at transfer facility includes:**
  - Frontloader and operator costs
  - Container costs based on external quote
  - Real estate costs based on current Queens warehouse rents
- **Overhead and profit on additional trucking and handling**
  - Overhead is 20% of all additional trucking and handling costs
  - Profit is 10% of all additional trucking and handling costs

## Contract price and clean-sheet estimate

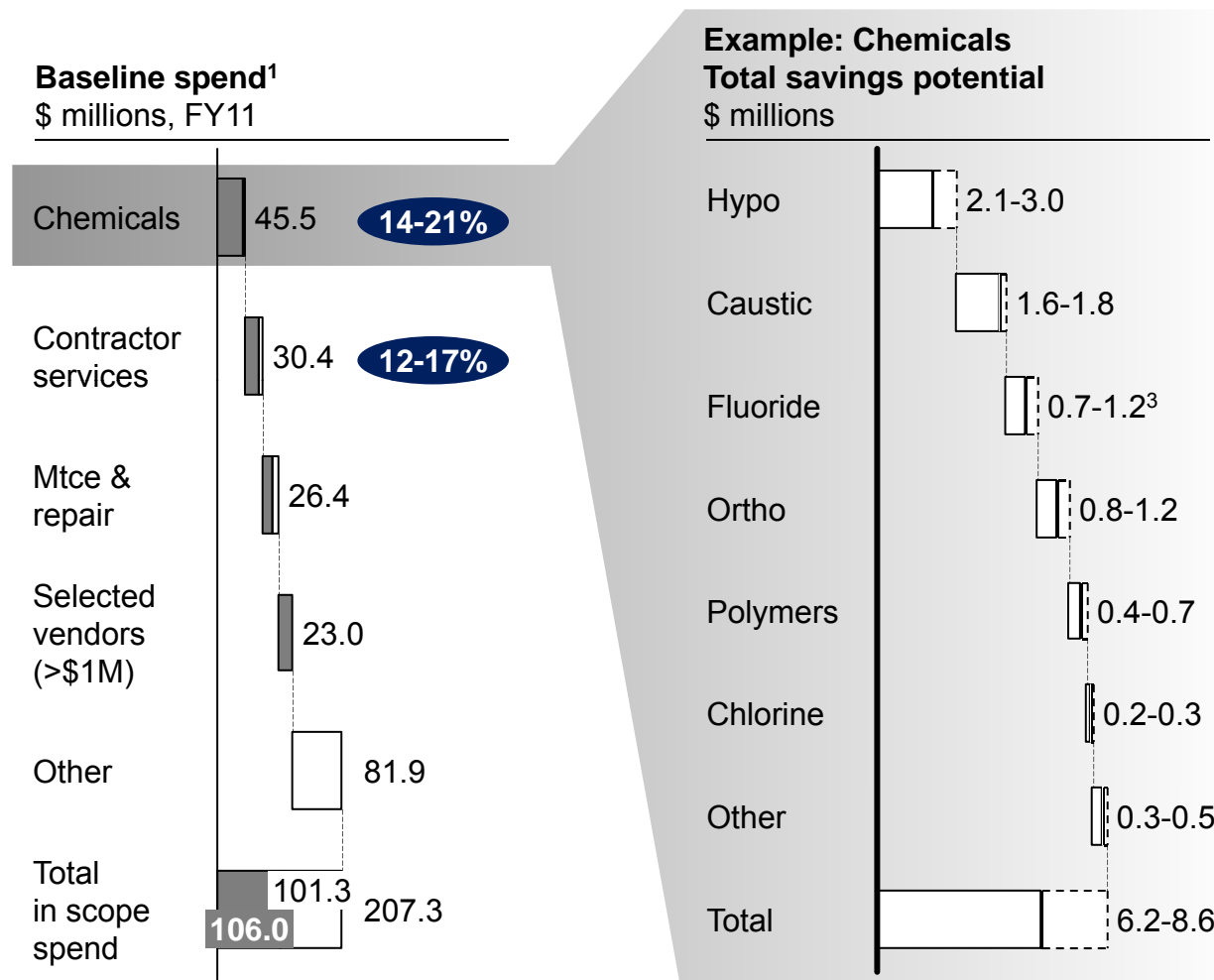


- **9-14% difference** between current price and clean sheet costing estimate driven by:
  - Service level requirements (e.g., 8 hr response time)
  - Lack of volume guarantee
  - No differentiation between base load and peak volume
  - Additional services layered on contract to be provided on an as needed basis
- **Potential savings of \$0.7-1.1 million**

# Procurement example: Renegotiation of chemicals contracts has already delivered \$750k; additional \$1.7 million quick-win expected

■ Evaluated in Phase 1

ⓧ Deep dive savings estimate<sup>2</sup>



## Quick-win savings in Chemicals:

- Annual savings of **\$614k and \$140k** have already been achieved through rapid **renegotiations** of the **Pencco fluoride** and **JCI Jones chlorine** contracts, respectively.
- Approximately **\$1.7 million in annual savings** could be implemented shortly by **switching BWSO's demand for caustic to a new BWT contract** (awaiting registration)

<sup>1</sup> Chemicals spend from DEP Finance, other spend from invoice database

<sup>2</sup> Deep dives have been thorough contract analyses to identify compression opportunity

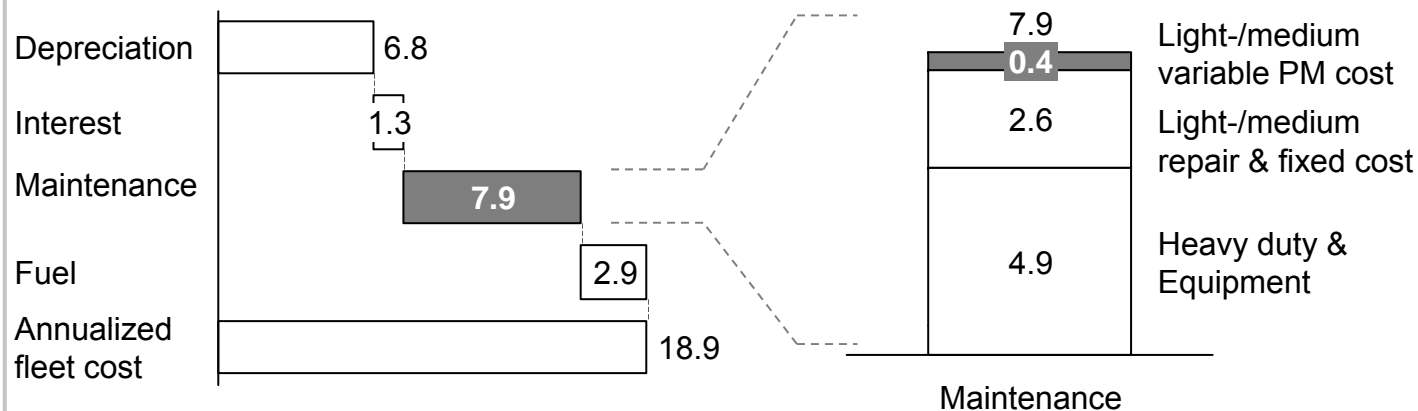
<sup>3</sup> Savings estimate takes into account reduction in fluoride dosing

## Fleet example: PM cycle for all LD and MD vehicles (excl. police) has been extended from 120 to 180 days; expected impact \$0.4M

While proposed preventive maintenance cycle change affects only small part of baseline ...

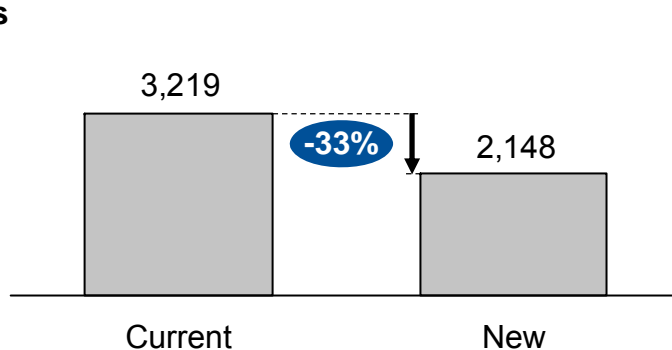
■ In scope

### Fleet cost, \$ millions, FY'11



... the PM change from 120 to 180 days will quickly reduce associated costs by 33%

### Number of light- and medium-duty PM jobs



- **Direct impact: \$128k** (33%) from reduction in PM parts and labor<sup>1</sup>
- **Additional indirect impact: \$240k** from reduction in travel time to repair shop<sup>2</sup>

<sup>1</sup> Avg length of PM = 2.5 hrs at \$41/hr (based on representative sample of work orders). Note: Most PMs done by Automotive Service Workers.

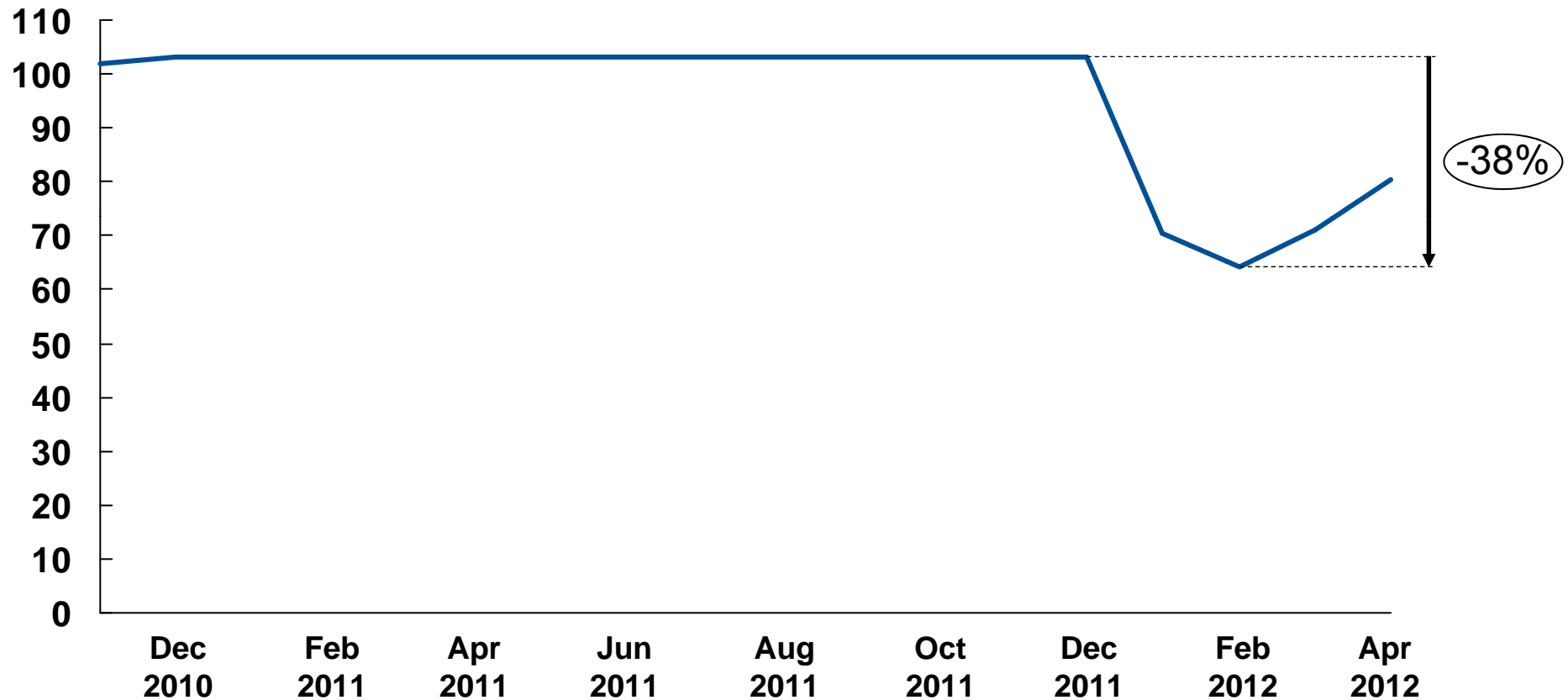
<sup>2</sup> Assumed time lost from dropping of and picking up vehicle = 5 hrs; avg. hourly cost for DEP employees = \$62.5/hr



## WWTP example: optimization of aeration basins operation

- ❖ In Phase 2, we will follow a pilot, refine, and roll-out approach for all front-line initiatives to prove concepts prior to a full roll-out

Volume of blown air (MCF/day); Jamaica Bay example



Able to achieve change savings by carefully monitoring the dissolved oxygen levels in the tanks

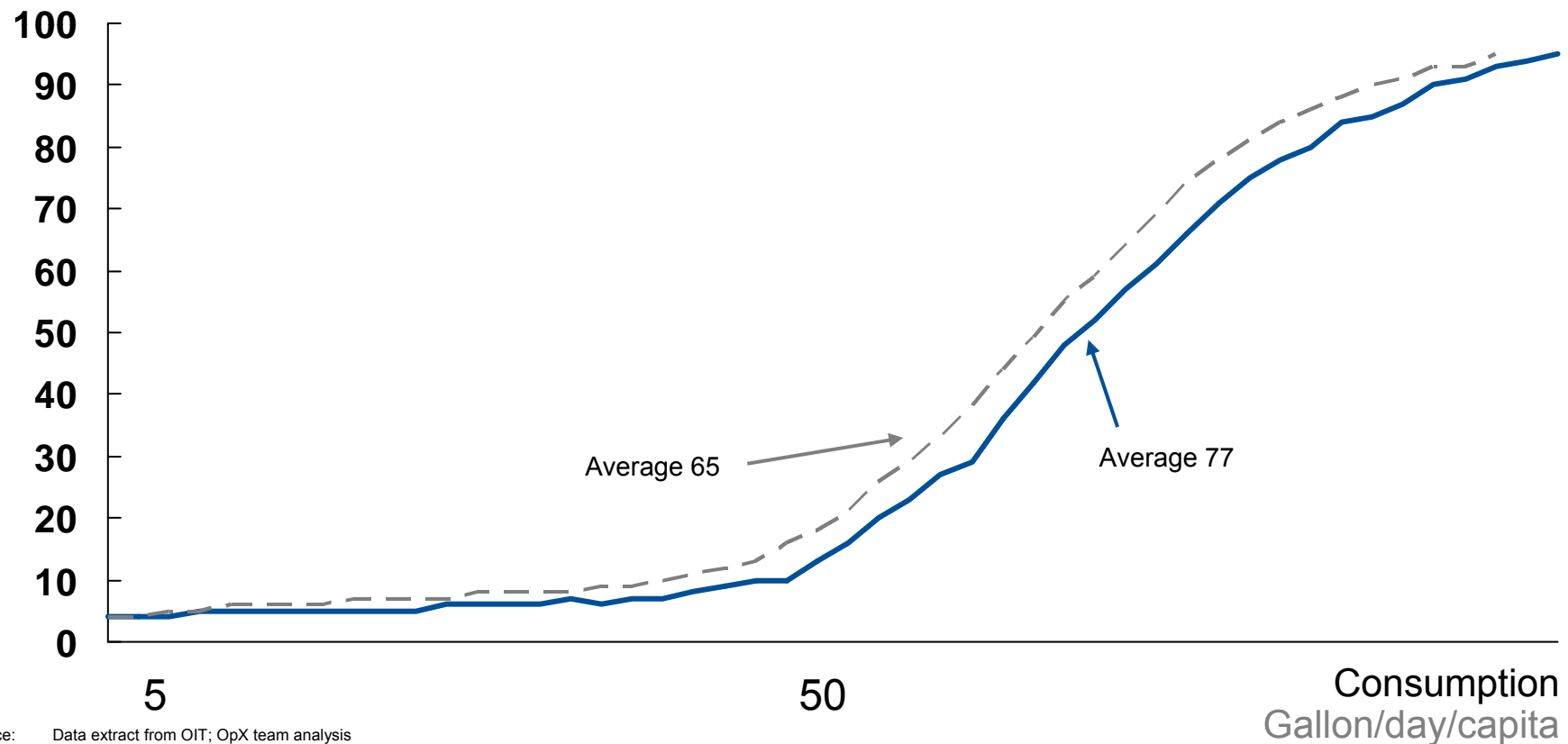
- ❖ Through statistical analysis, identified strong large meter candidates for replacement that could generate more than \$40 million in revenues

Normalized distribution analysis shows a difference of 12 gpd/capita or 19% between displacement & single-jet meters

Example: 2" displacement meters, apartments buildings with elevators

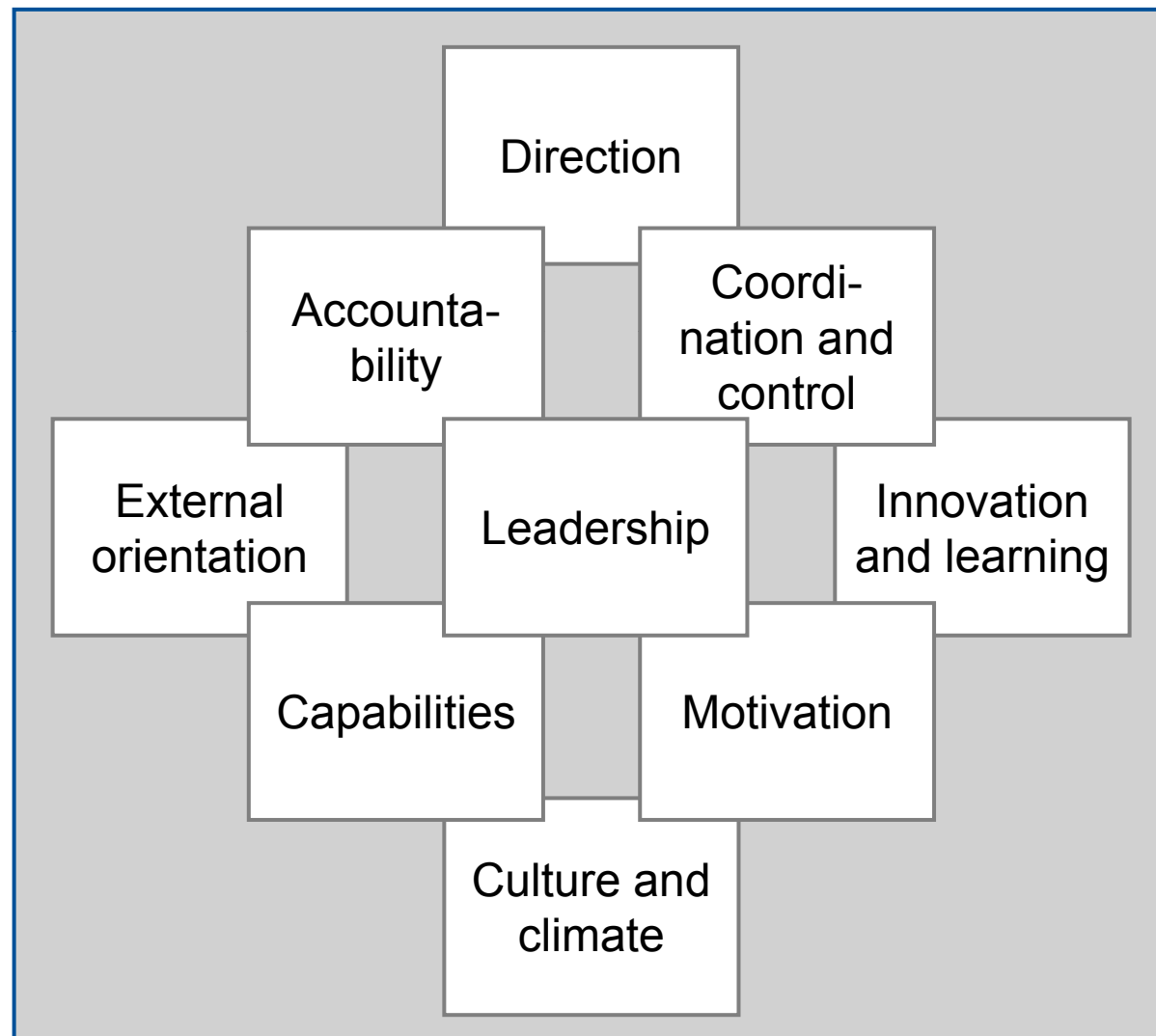
— Single-jet (419)  
- - Displacement (1074)

Cumulated frequency  
Percent



## Embrace OpX as a transformation in order to achieve scale and sustainability

- ❖ Organizational Survey of all employees will help determine the health of DEP as an organization and provide a base for improvement



## OpX is structured to deliver maximum value as fast as possible



**Purpose:** In 2011, DEP partnered with Veolia Water, McKinsey and Company and Arcadis to identify opportunities to improve DEP's drinking water, sewer, and wastewater treatment operations and **make DEP the safest, most reliable, cost-efficient utility in the nation**

### Phase 1

November 2011 to  
May 2012

OpX team assessed DEP's major facilities; interviewed more than 60 individuals, observed more than 800 hours of work, identified opportunities for transformation and savings, and prepared business cases

OpX team has identified approximately **\$108m-\$130m in potential savings and revenue enhancement**, after considering certain implementation costs

Of these, **\$4.9m of annual savings have already been implemented**, with additional quick wins worth **\$12.0-14.5m in early FY13**

City to determine whether to proceed with Phase 2

### Phase 2

June 2012 to  
June 2016

Follow Phase 2 Implementation Plan to achieve long term transformation and savings over 4 years

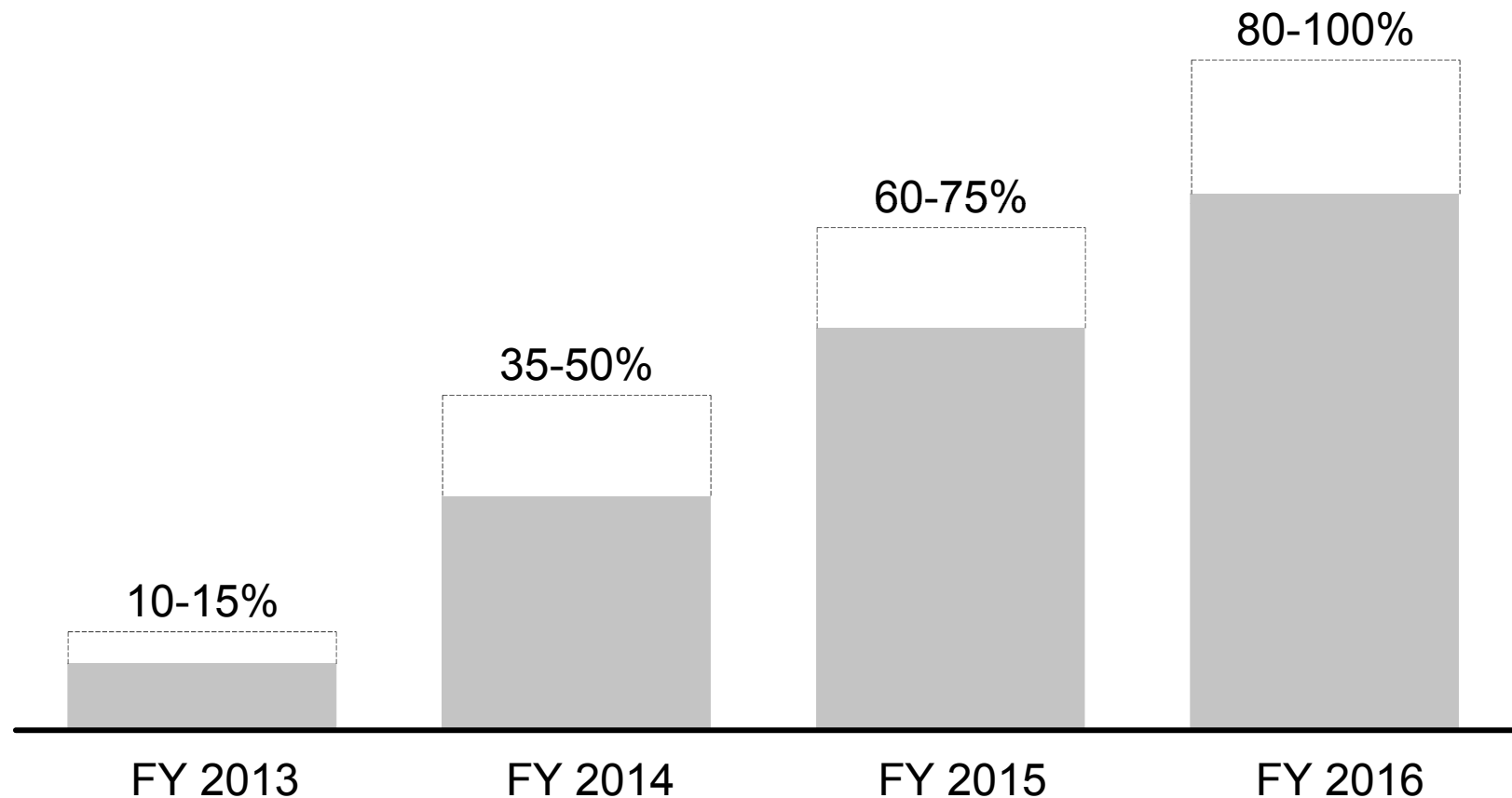
## Potential financial impact

- ❖ The potential financial benefits of the OpX initiatives will ramp-up over time

Percent of total opportunity implemented

Benefit achieved as a % of total benefit, full fiscal year effect

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**Operational Excellence**

**The best always do better**