

# This presentation premiered at WaterSmart Innovations

[watersmartinnovations.com](http://watersmartinnovations.com)



# Perfect Partners

**Denver Water and  
Denver Public Schools**

**USE ONLY  
WHAT YOU  
NEED.**

 **DENVER WATER**  
denverwater.org

# **History of Water Conservation Efforts with Government Customers**

---

- **2006 - Denver Water (DW) directed additional efforts to government customers**
- **2007 - DW selected an employee to become part of the Greenprint office, inside the Mayor's office**
- **2008 - RFP for a water audit of Denver Public Schools (DPS)**

**USE ONLY WHAT YOU NEED.**



# Hiring of Engineering Firm to Perform Audit

---

- **RFP released July 2008**
- **SOW**
  - **Site visits to all 124 schools to collect data**
  - **Identify water use at audited sites**
  - **Water balances developed for each site**
  - **Summary reports – 124 individual and one final comprehensive.**

**USE ONLY WHAT YOU NEED.**



# Hiring of Engineering Firm to Perform Audit

---

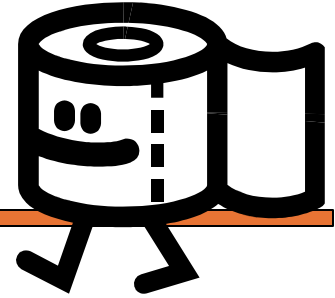
- **Selected firm with creative student involvement**
  - **students involvement included:**
    - **Performing water assessments with team leaders from the engineering firm**
    - **Provide water conservation education for their classmates**
- **Started project in October 2008**
- **Report finalized June 2010**

**USE ONLY WHAT YOU NEED.**



# Indoor Retrofits

---



- **When all restroom fixtures are replaced at 124 schools, DPS will save:**
  - **57 million gallons (175 AF) of water/yr**
  - **At current water rate = \$304,000 /yr**
- **Achieving a 70% decrease of plumbing maintenance at retrofitted schools = huge labor savings for school**

**USE ONLY WHAT YOU NEED.**



# More Indoor

---

## How many fixtures?

- 4,112 Toilets
- 1,714 Urinals
- 3,583 Faucets
- 305 kitchen pre-rinse spray valve retrofits provided by DW



**USE ONLY WHAT YOU NEED.**

 **DENVER WATER**

# Passing Bond Project for School Improvements

---

- Bond was approved by the Denver voters by a 2 to 1 margin in November 2008
- The total bond value = \$454 million for building new schools and upgrading existing buildings



**USE ONLY WHAT YOU NEED.**



# Stretching the Bond Dollars

---

- Established an “in-house” crew to complete the remaining schools
- Seed money from bond money = 1.37 million = 1 project manager, 1 crew chief, 2 plumbers and 1 carpenter



**USE ONLY WHAT YOU NEED.**



# Water Savings Verified

---

## East High (9-12) School - 1925

- Fixtures replaced= 92 faucets, 67 toilets, 40 urinals
- 40% water savings

## Smiley Middle (6-8) School - 1928

- Fixtures replaced = 27 faucets, 38 toilets, 26 urinals
- 25% water savings

## College View (ECE-5) School - 1990

- Fixtures replaced = 21 faucets, 38 toilets, 10 urinals
- 47% water savings

**USE ONLY WHAT YOU NEED.**



# From Purchasing Fixtures to Providing **Rebates**

---

- DW started procuring the fixtures on a school by school basis
  - 2064 fixtures purchased by DW and provided to DPS
  - Average cost / fixture was \$175.00
- Switched to **rebates** – better for all
  - DPS can order and install specific brand
  - DPS is in control of timing
  - Saves DW time and \$
  - Average cost now \$106.00

**USE ONLY WHAT YOU NEED.**



# Progress to Date

## Rebates

---

### Bond and in-house construction efforts

Total Fixtures		Total Rebates	
<i>Number of Fixtures replaced:</i>	1148	<b>Paid</b>	<b>\$93,535.70</b>
<i>Remaining Fixtures:</i>	2124	<b>Pending</b>	<b>\$422,461.80</b>
<i>Total Number of Fixtures</i>	3272	<b>Total</b>	<b>\$515,997.50</b>

**USE ONLY WHAT YOU NEED.**



# Before and After Photos



**USE ONLY WHAT YOU NEED.**

 **DENVER WATER**

# Before and After Photos



**USE ONLY WHAT YOU NEED.**

 **DENVER WATER**

# Moving Efforts Outdoors

---

- **DPS maintains ~ 620 acres of irrigated landscape**
- **Irrigation Systems = \$805,000 estimated cost**
  - **“Tune-Up” irrigation systems**
    - **Install rain sensors**
    - **Install booster pumps where necessary**
    - **Convert spray sprinklers to more efficient spray**
  - **Upgrade existing controllers to climate-based**
- **48 million gallons or 147 AF could be saved annually**
- **At current water rate = \$130,000 per year**

**USE ONLY WHAT YOU NEED.**



# Additional Highlights



- **Potential indoor and outdoor water savings of 322 AF/yr**
- **411 DPS students involved in audit process**
- **Over 12 million sq ft of building assessed**
- **Over 27 million sq ft of irrigated landscape assessed**

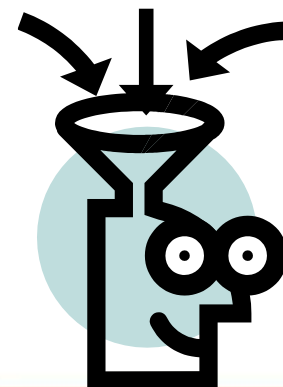
**USE ONLY WHAT YOU NEED.**



# Lessons Learned

---

- **Rebate fixtures from the beginning**
- **Aerators only - not faucets**
- **Manual flush valves only**
- **Only retrofits - not new construction**
- **No carriers with retrofits**



**USE ONLY WHAT YOU NEED.**

# Questions?



**Donna Pacetti**

**[Donna.pacetti@denverwater.org](mailto:Donna.pacetti@denverwater.org)**

**303.628.6327**

**USE ONLY WHAT YOU NEED.**

