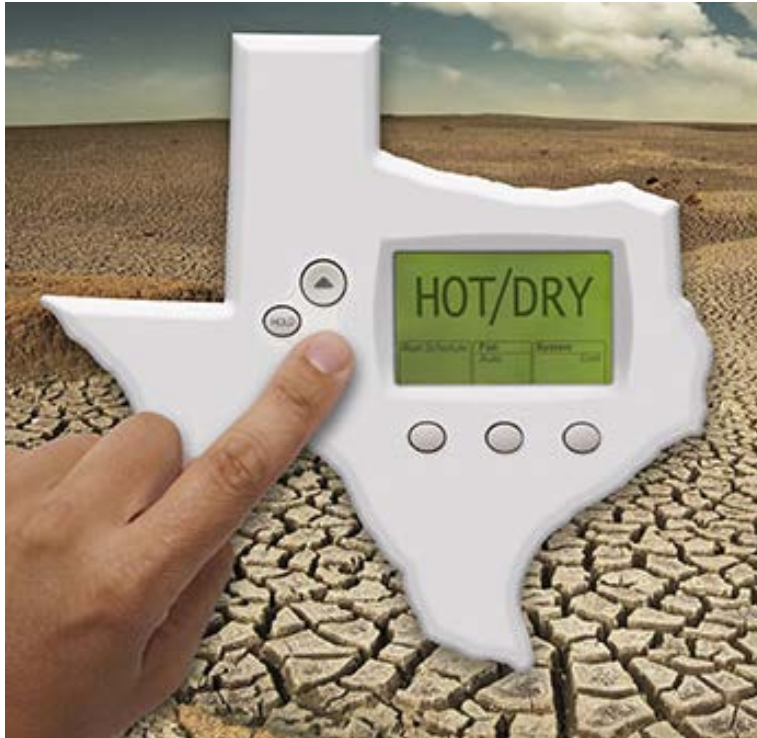


# This presentation premiered at WaterSmart Innovations

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





# Irrigation Restrictions vs. Treatment & Distribution Concerns: A Comprehensive Approach to Scheduling

Water Smart Innovations 2012

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# About Austin Water

- Water Source - Colorado River
  - Firm water rights (“run of river”)
  - Contract with LCRA for stored water
- Service Area – 538 sq miles
- Customers – 900,000
  - 1,100 Employees
  - \$500+ Million Annual Budget



# Ideal Irrigation Restrictions:

- Save water
- Are easy to communicate
- Are easy to follow
- Are enforceable
- Are manageable within system constraints
  - Demand doesn't exceed treatment capacity
  - Demand is evenly distributed throughout week
  - Demand does not create pressure problems

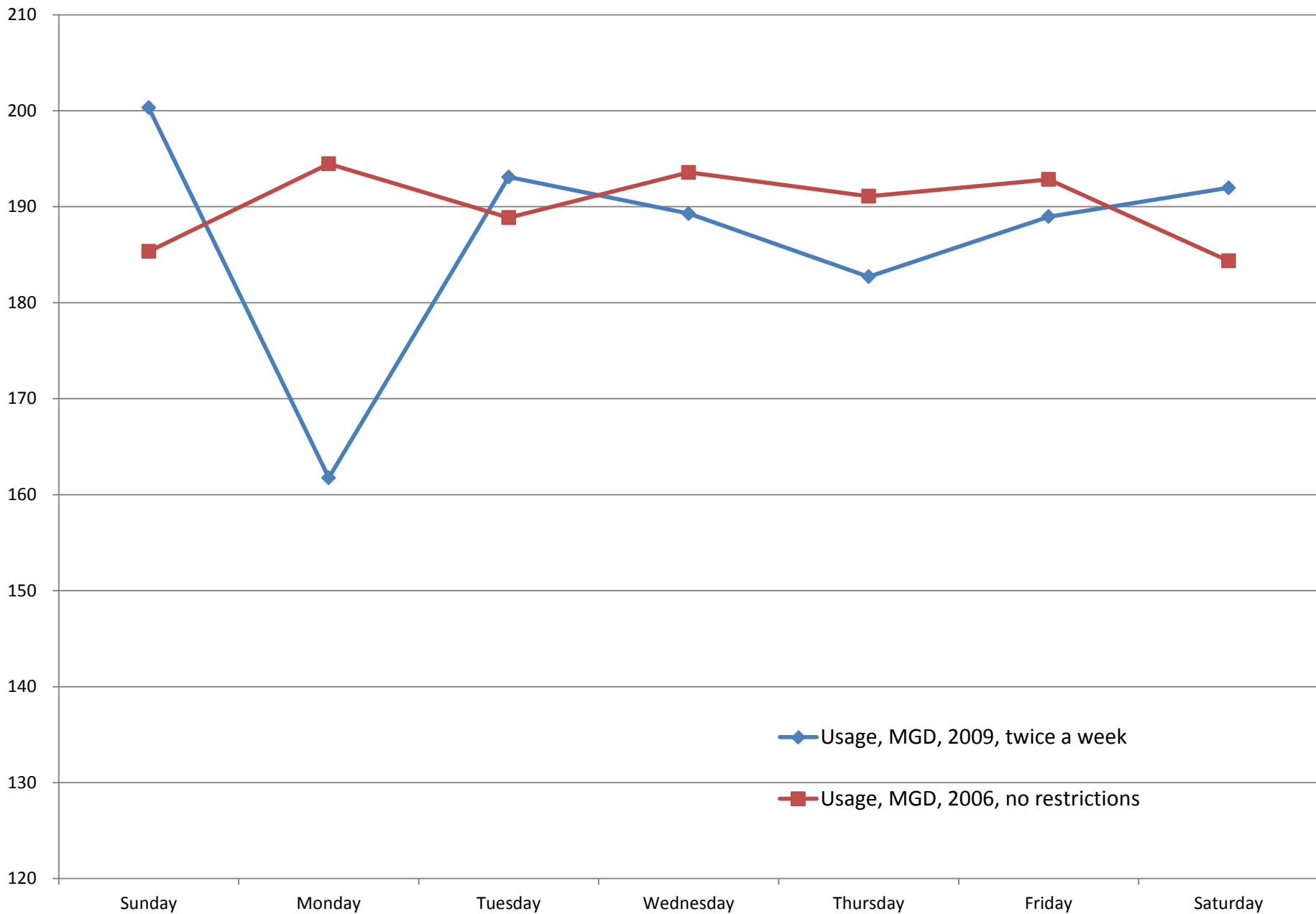
# Austin's Restrictions

- **Mandatory 2x per week in Austin since 2007**
  - Seasonal (Stage 1) for residential customers (automatic and hose-end)
  - Year-round for commercial & multi-family
  - No midday watering
- **Stage 2 Drought Restrictions – 1x per week**
  - In effect August 24-November 21, 2009
  - In effect September 6, 2011 – June 16, 2012
- **Stage 3 Drought Restrictions – no watering**
- **Revisions began October 2011**

# Effects on Water Use

- Clear compliance evident
  - Time of Day: Peaks before 10a and after 7p
  - Day of Week: No-watering day showed dramatic drop in pumpage
- Overall reduction in peak day use
- Overall reduction in average GPCD
- Demand relatively even between sectors on outdoor water use days

# Summer Water Usage per Week Day, MGD





RESIDENTIAL Odd Address		RESIDENTIAL Even Address		COMMERCIAL & MULTIFAMILY All Addresses	
Water up to 2 days each week   Before 5:00 a.m. &/or after 7:00 p.m.					
Wed	Sat	Thur	Sun	Tue	Fri

**One Day Watering ONLY**

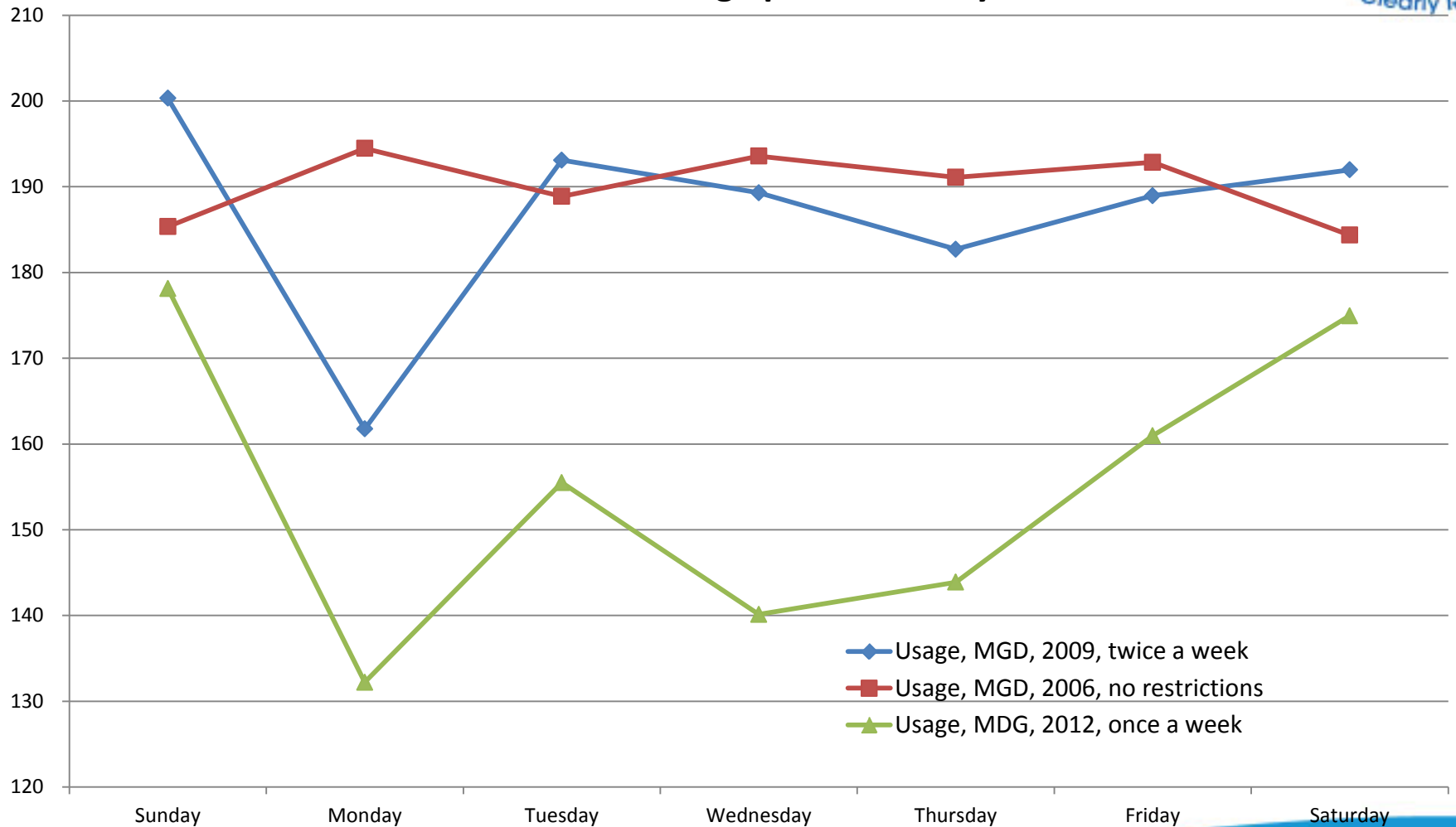
<b>STAGE 2</b> <b>WATER</b> <b>RESTRICTIONS</b> TAKE EFFECT SEPTEMBER 6	RESIDENTIAL ODD ADDRESS	RESIDENTIAL EVEN ADDRESS	COMMERCIAL, MULTIFAMILY ODD ADDRESS	COMMERCIAL, MULTIFAMILY EVEN ADDRESS
	AUTOMATIC IRRIGATION SYSTEMS: BEFORE 10 A.M. HOSE-END SPRINKLERS, SOAKERS: BEFORE 10 A.M. or AFTER 7 P.M.			
	<b>Saturday</b>	<b>Sunday</b>	<b>Tuesday</b>	<b>Friday</b>
	<b>REPORT VIOLATIONS TO 3-1-1</b>			



# Once Per Week Schedule

- Stage 2 allows once per week watering
- In 2009, extensive rain within 3 weeks of Stage 2
- In 2011, continued triple digit temperatures and no rainfall
- 3<sup>rd</sup> lowest GPCD in history despite record-setting heat and dry conditions
- Schedule was effective, but with consequences

## Summer Water Usage per Week Day, MGD



# Treatment & Distribution

- Continued high peaks in off-season hindered repair efforts
- Low weekday use created potential water quality problems
- Large swings hampered pump efficiency
- Some areas at risk for pressure problems due to limited reservoir or pump capacity
- Not meeting original goal of reducing peak use

# Crafting a New Schedule

- Evenly distributed across days
- If uneven, prefer lower weekend usage
- Easy to communicate
- Consistent with twice-per-week schedule
- Easy to enforce

# Option: Last Digits

- More addresses end in 0 and 1 citywide
- Even more 0s and 1s in affluent neighborhoods
- 0 and 1 tend to be larger properties
- Should you differentiate by customer class?
- Would require unique schedule for each utility; not regionally consistent

# August 2011 Usage

## Single Family

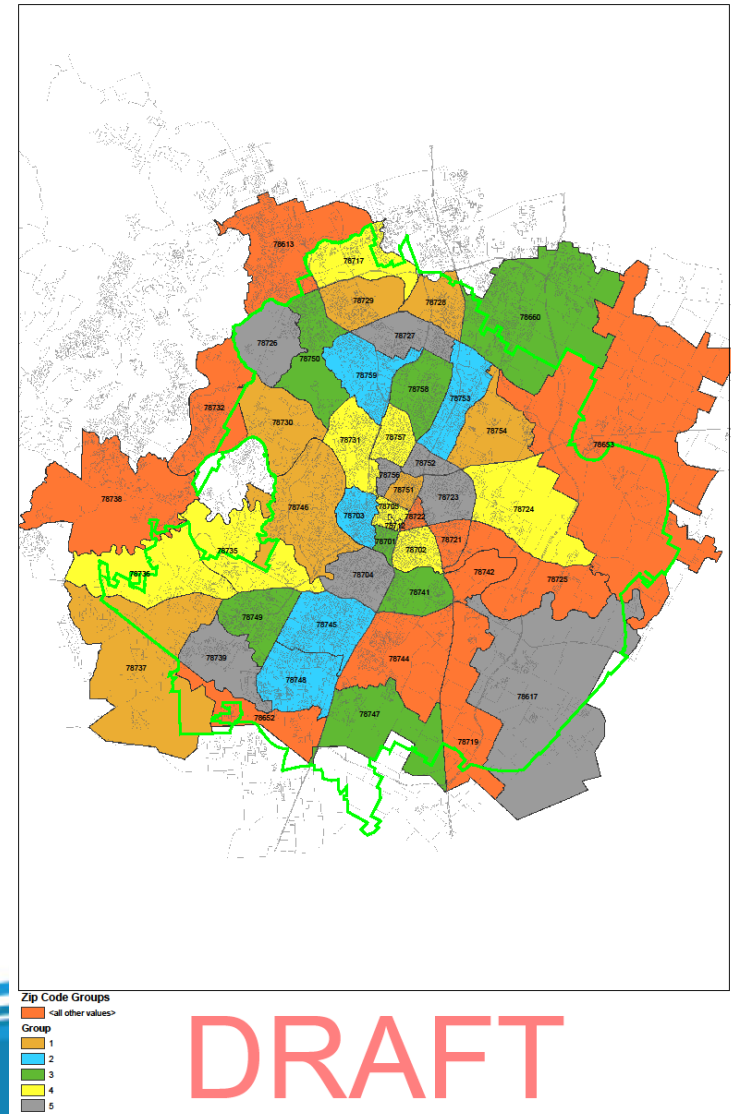
Last Digit	Use, TG	Last Digits	Use, TG
0	333,184	6,7,8,9	772,061
1	330,266	0,4,5	860,672
2	262,724	1,2,3	849,903
3	256,914		<b>2,482,636</b>
4	256,903		
5	270,584		
6	200,109		
7	198,131		
8	187,579		
9	186,242		
<b>Total</b>	<b>2,482,636</b>		

## Commercial & Multifamily

Last Digit	Use, TG	Last Digits	Use, TG
0	675,039	0,2	771,396
1	662,052	1,3	775,395
2	96,357	4,5,6,7,8,9	768,054
3	113,343	<b>Total</b>	<b>2,314,845</b>
4	118,064		
5	242,898		
6	93,741		
7	102,979		
8	97,218		
9	113,154		
<b>Total</b>	<b>2,314,845</b>		

# Option: ZIP Codes

- Uniform within ZIP code regardless of customer class
- Easy to understand and enforce
- Harder to report if driving by
- May create pressure problems in some areas
- Cannot share schedule regionally



**DRAFT**



# Option: System Type & Digits

- Divided by customer class and automatic/hose
- Each customer keeps one day from twice per week schedule
- Automatic systems scheduled during week
- Hose-end sprinklers on weekends
- Commercial remains odd/even
- Added some watering to Mondays to reduce pumpage swings

# New Schedule

## STAGE 2 WATER RESTRICTIONS

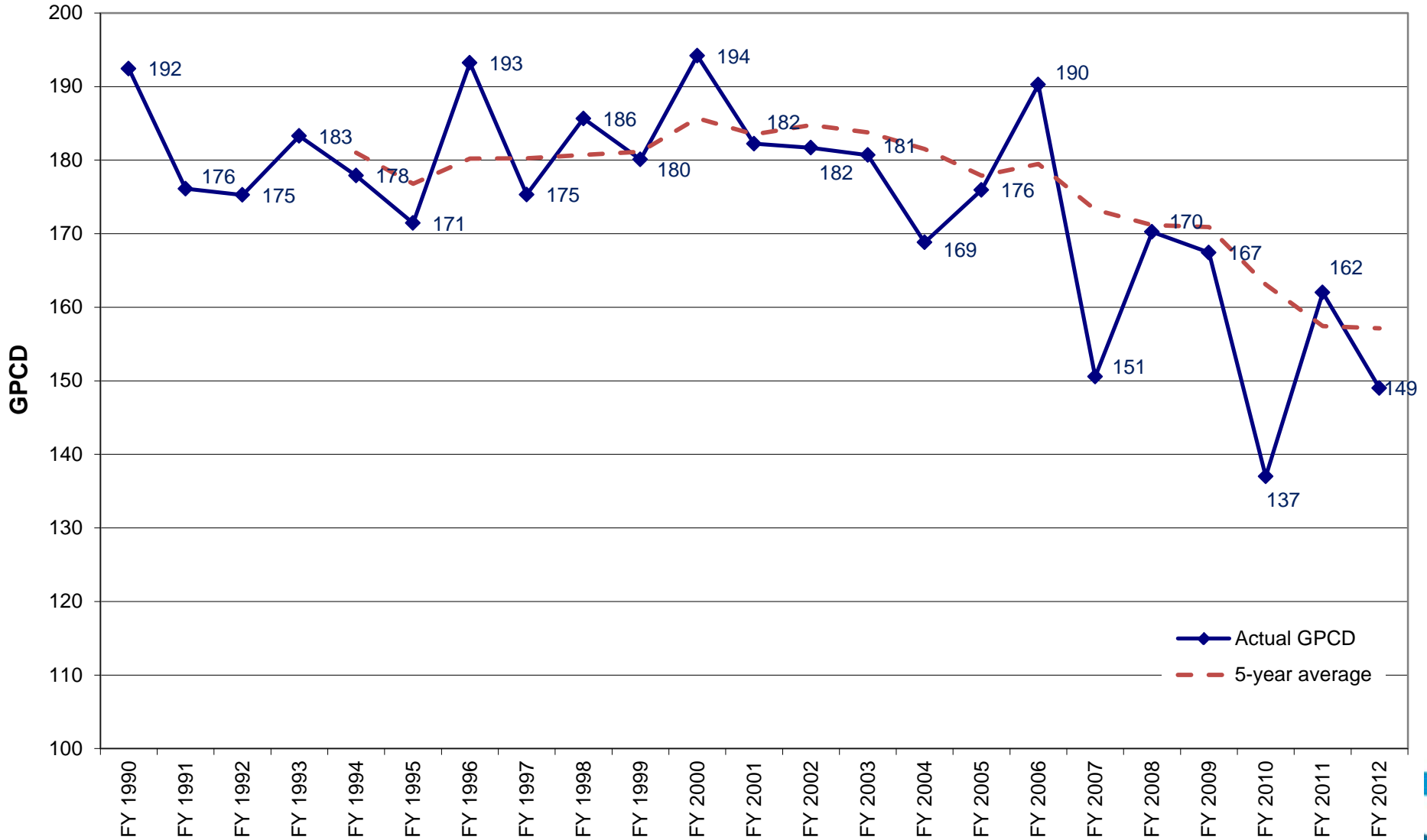
RESIDENTIAL ODD ADDRESS	RESIDENTIAL EVEN ADDRESS	COMMERCIAL MULTIFAMILY EVEN ADDRESS	COMMERCIAL MULTIFAMILY ODD ADDRESS
<b>AUTOMATIC IRRIGATION SYSTEMS</b>			
<b>Wednesday</b> BEFORE 5 A.M. or AFTER 7 P.M.	<b>Thursday</b> BEFORE 5 A.M. or AFTER 7 P.M.	<b>Tuesday</b> BEFORE 5 A.M. or AFTER 7 P.M.	<b>Friday</b> BEFORE 5 A.M. or AFTER 7 P.M.
<b>HOSE-END SPRINKLERS</b>		<b>PUBLIC SCHOOLS</b>	
<b>Saturday</b> BEFORE 10 A.M. or AFTER 7 P.M.	<b>Sunday</b> BEFORE 10 A.M. or AFTER 7 P.M.	<b>Monday</b> AUTOMATIC IRRIGATION SYSTEMS BEFORE 5 A.M. or AFTER 7 P.M.	

**REPORT VIOLATIONS TO 3-1-1**

# Going Forward...

- Monitor effects of time-of-day peaks
  - Boosted zones with small number of customers may create uneven peaks or peaks that exceed pumping/reservoir capacity
  - Identify opportunities to reduce irrigation use or regulate pressure
  - Promote staggered schedules within watering window
- Study impact on peak day use during once per week schedule

# GPCD from 1990 to 2012



# Questions?

How many bottles of water could you replace with just \$1.00 worth of Austin's drinking water?



*Answer: About 2,000!*

## **Drema Gross**

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