



Reconnecting the Great Lakes Water Cycle

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# Financial Benefits of Water Efficiency Programs

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# Water Efficiency Benefit-Cost Analysis for Six Communities

## Province of Ontario, Canada

- City of Guelph
- Regional Municipality of Waterloo
- City of Waterloo

## Oakland County, Michigan, United States

- Commerce Township
- Lyon Township
- Southwest Oakland Township

*All have water systems operated by the  
Oakland County Water Resources  
Commissioner's Office*

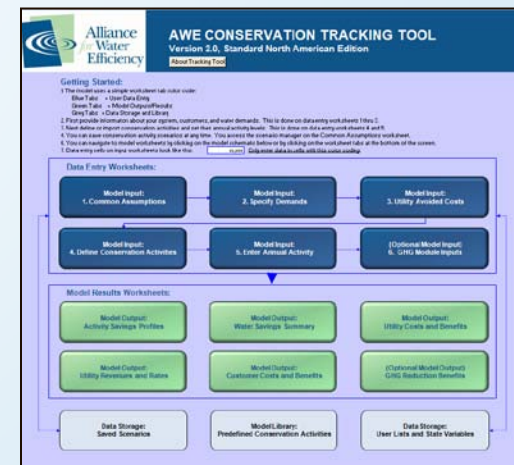
# Components of Benefit-Cost Analysis

## Inputs

- Demographic data
- Weather data
- Customer utility rates
- Water demand forecast
- Avoided utility costs
- Efficiency program information
- Energy data

## Outputs

- Water savings
- Costs and benefits
- Impact to revenue and rates
- Greenhouse gas and energy reductions



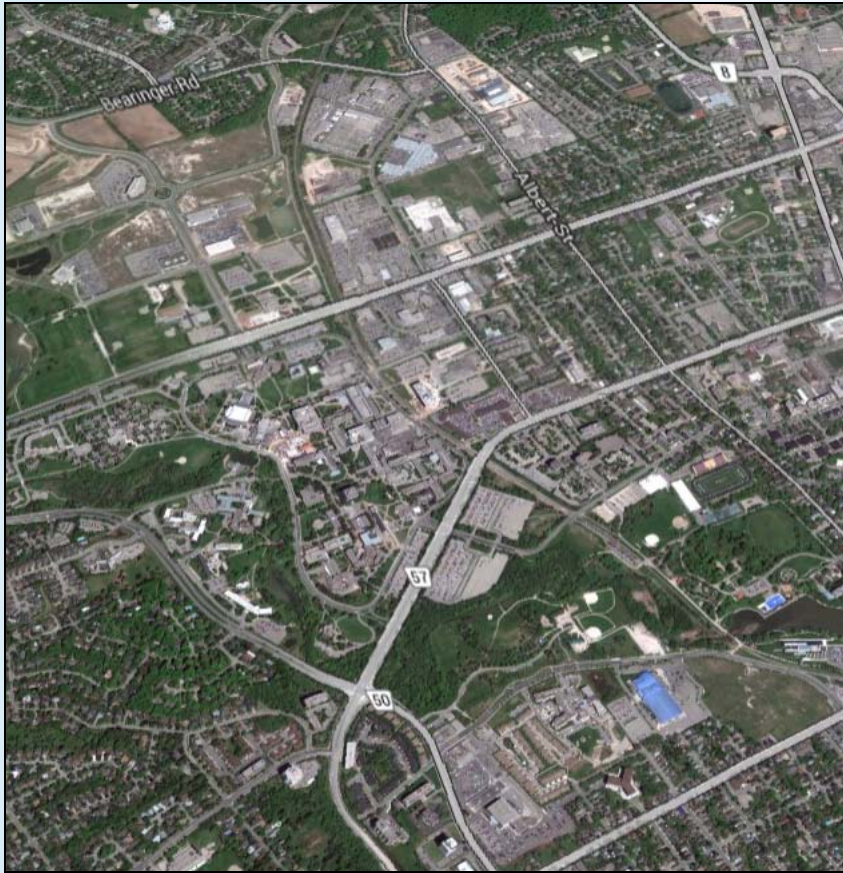
# What are Example Costs Associated with Water Conservation Programs?

- Cost of incentives
  - Rebates
  - Device Distribution/Installation
- Staff time
- Marketing and Outreach

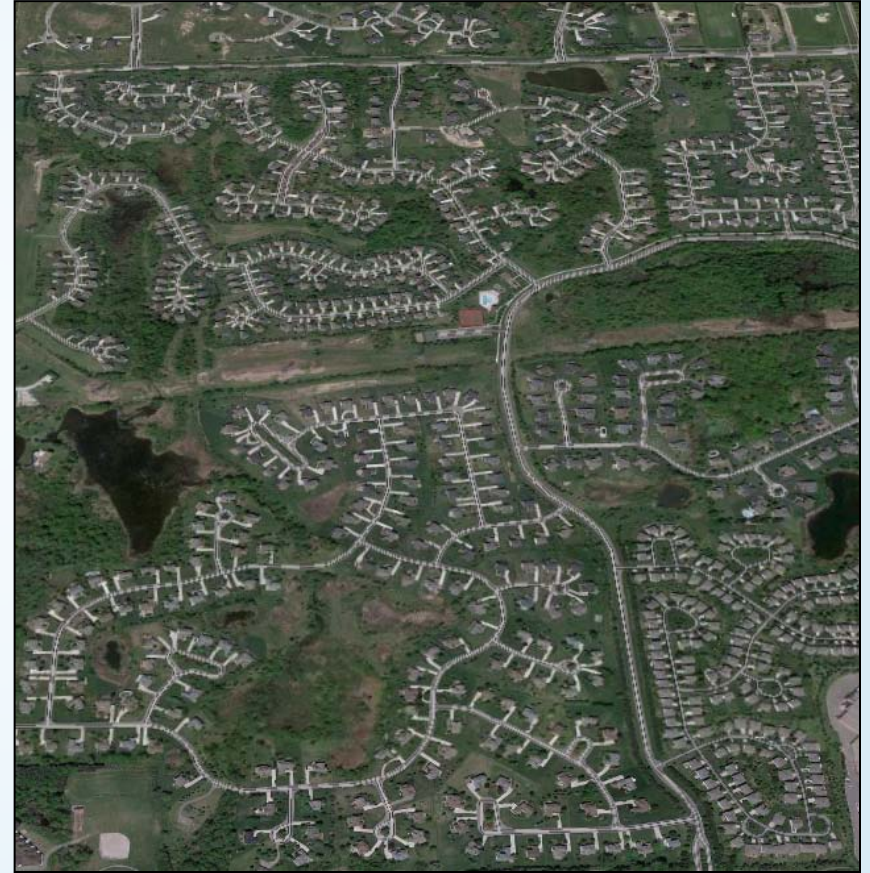
# What are Example Benefits Associated with Water Conservation Programs?

- Short-term
  - Water purchase costs (if supplied by wholesaler)
  - Variable water treatment costs
    - Energy costs related to pumping and treatment
    - Chemical costs
- Long-term
  - Avoid, Defer, and/or Downsize Expansion Projects

# Community Characteristics



City of Waterloo, ON

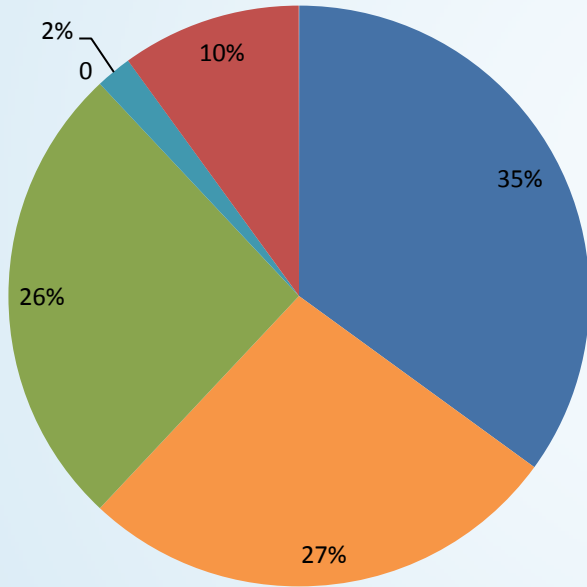


Southwest Oakland Township, MI

*Source: Google Earth. 2014.*

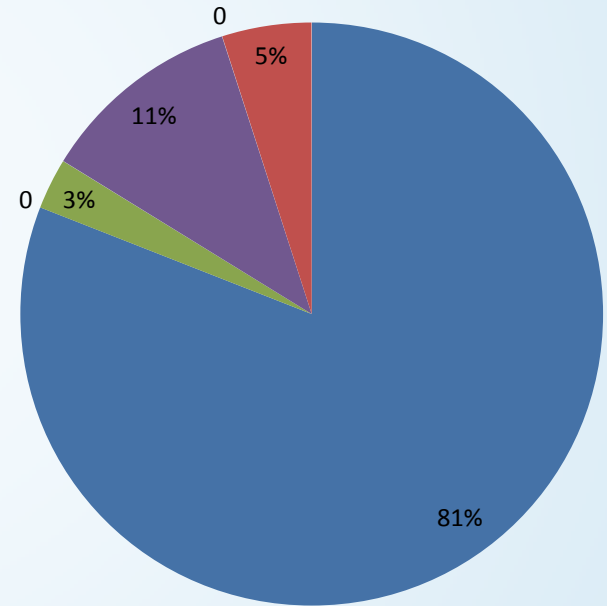
# Water Use Profiles

## Region of Waterloo, ON



- Single-family
- Multifamily
- CII
- Other
- Non-revenue Water

## Southwest Oakland Township, MI



- Residential
- Irrigation
- Commercial
- Non-revenue Water

# Indoor Water Efficiency Programs Evaluated

- Toilet Replacements
- Toilet Flapper Replacements
- Clothes Washers
- Hot Water Recirculation Systems
- Voluntary New Home Specifications
- Residential Package Graywater Systems
- Pre-rinse Spray Valves
- Restaurant Certification
- Capacity Buyback Program
- Cooling Towers
- Site Visits
- Education





# Outdoor Water Efficiency Programs Evaluated

- Landscape Surveys
- Weather Based Irrigation Controllers
- Soil Moisture Sensors
- Efficient Sprinkler Nozzles
- Residential Rainwater Harvesting



# Guelph, ON Costs and Benefits

Activity Name	PV Cost (\$)	PV (\$) Benefit	NPV (\$)	B/C Ratio
Royal Flush Toilet Rebate, SF	\$ 1,676,300	\$ 12,068,155	\$ 10,391,855	7.20
Royal Flush Toilet Rebate, MF	\$ 525,400	\$ 2,534,944	\$ 2,009,544	4.82
Royal Flush Toilet Rebate, ICI	\$ 55,800	\$ 441,405	\$ 385,605	7.91
Smart Wash Washing Machine Rebate	\$ 1,333,250	\$ 4,806,374	\$ 3,473,124	3.61
Blue Built Home - Bronze	\$ 329,280	\$ 545,126	\$ 215,846	1.66
Blue Built Home - Silver	\$ 15,900	\$ 21,487	\$ 5,587	1.35
Greywater Reuse Systems	\$ 21,000	\$ 3,157	\$ (17,843)	0.15
ICI Audit and Capacity Buyback Program	\$ 967,395	\$ 12,323,719	\$ 11,356,324	12.74
Rainwater Harvesting System	\$ 50,000	\$ 7,264	\$ (42,736)	0.15
Healthy Landscape Visit	\$ 368,970	\$ 36,022	\$ (332,948)	0.10
Efficient Home Visit Surveys (GEL/NetZero City)	\$ 229,505	\$ 24,127	\$ (205,378)	0.11
<b>Total</b>	<b>\$ 5,572,800</b>	<b>\$ 32,811,780</b>	<b>\$ 27,238,980</b>	<b>5.89</b>

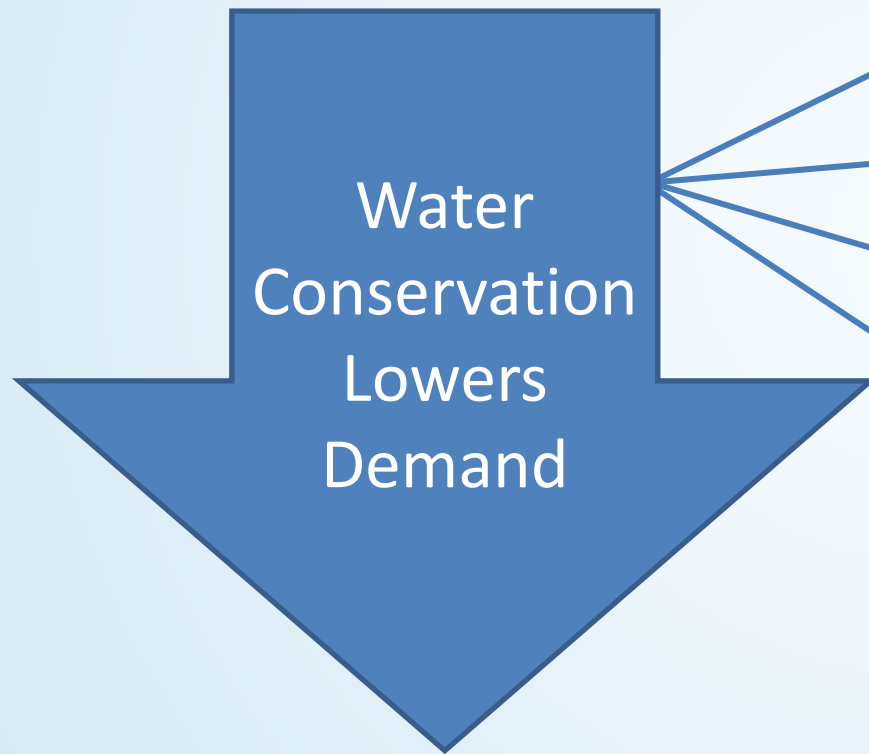
# Region of Waterloo, ON Costs and Benefits

Activity Name	PV Cost (\$)	PV (\$) Benefit	NPV (\$)	B/C Ratio
CII Tank-Type HE Toilet	\$ 8,791	\$ 124,655	\$ 115,864	14.18
CII Valve-Type HE Toilet	\$ 50,168	\$ 94,846	\$ 44,678	1.89
CII Laundromat	\$ 12,900	\$ 27,250	\$ 14,350	2.11
CII Pre-Rinse Spray Valve	\$ 22,170	\$ 334,930	\$ 312,761	15.11
Community Education	\$ 1,290,042	\$ 370,051	\$ (919,991)	0.29
School Curriculum	\$ 143,338	\$ 32,530	\$ (110,808)	0.23
Developer Incent: Hot W. Recirc System	\$ 57,335	\$ 61,771	\$ 4,436	1.08
Developer Incent: RainW Harv. System Plumbed	\$ 334,455	\$ 38,147	\$ (296,309)	0.11
Targeted User Prog: Education	\$ 1,146,704	\$ 1,390,991	\$ 244,287	1.21
Targeted User Prog: Audit	\$ 365,512	\$ 495,456	\$ 129,944	1.36
Targeted User Prog: Rebate	\$ 401,346	\$ 2,644,591	\$ 2,243,245	6.59
CII Cooling Tower	\$ 267,564	\$ 168,968	\$ (98,596)	0.63
Restaurant Certification Program	\$ 121,837	\$ 636,457	\$ 514,619	5.22
CII Audit/Recommendations	\$ 1,469,215	\$ 3,498,394	\$ 2,029,179	2.38
Developer Incent: GreyW. Recyc. System	\$ 86,003	\$ 4,496	\$ (81,507)	0.05
Residential Rainwater Harvesting Rebate Outdoor Only	\$ 157,672	\$ 19,958	\$ (137,714)	0.13
Toilet Flapper Replacement	\$ 86,003	\$ 158,866	\$ 72,864	1.85
<b>Total</b>	<b>\$ 6,021,057</b>	<b>\$ 10,102,358</b>	<b>\$ 4,081,302</b>	<b>1.68</b>

# Oakland County, Michigan Costs and Benefits

Activity Name	<u>Commerce</u>	<u>Lyon</u>	<u>SW Oakland</u>
	B/C Ratio	B/C Ratio	B/C Ratio
Residential High-Efficiency Toilet Rebates	13.57	1.42	2.29
Residential High-Efficiency Clothes Washer Rebates	2.84	0.45	0.71
Residential Efficient Irrigation Nozzle Replacements	0.51	0.09	0.09
Residential Irrigation ET Controller Rebates	1.22	0.20	0.21
Residential Soil Moisture Sensor – Targets High Water Users	3.08	0.69	0.83
Large Landscape Surveys	4.27	0.74	0.77
Large Landscape Irrigation Controller Rebates	3.94	0.64	0.66
<b>Total</b>	<b>7.22</b>	<b>0.75</b>	<b>0.97</b>

# What is the Financial Impact of Water Conservation and What about Rates?



**Reduces short-term costs**

**Reduces long-term costs**

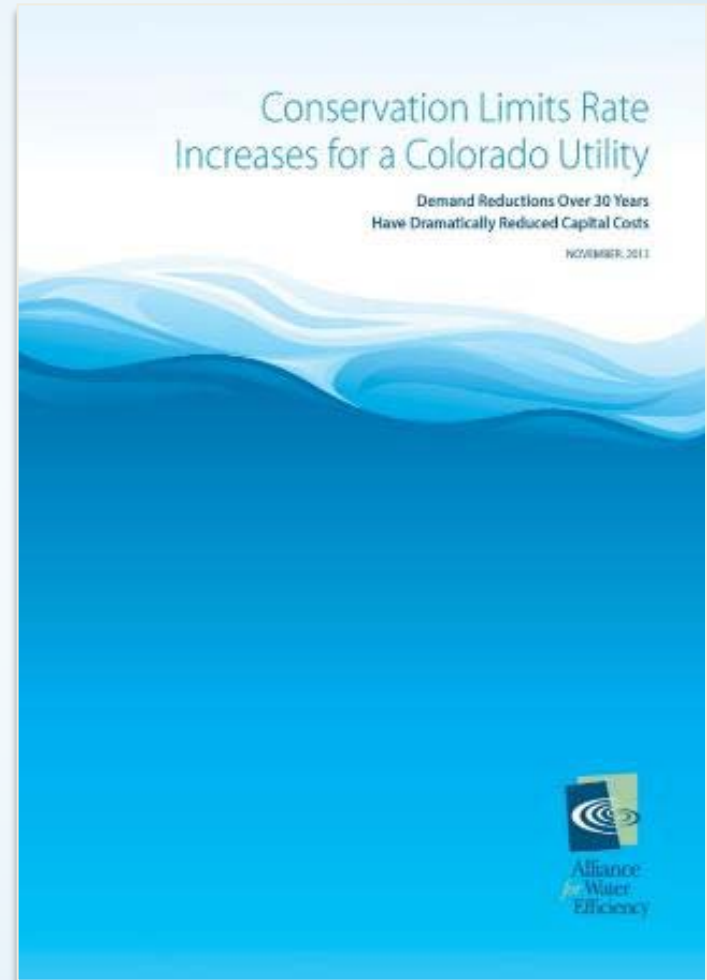
**Sustains water resources**

**Reduces sales volumes**

**(and revenue if rates are not adjusted)**

# Westminster's Story

- Citizens complained about being asked to conserve when rates would just go up anyway
- Westminster reviewed marginal costs for future infrastructure if conservation had not been done
- Since 1980 conservation has saved residents and businesses 80% in tap fees and 91% in rates compared to what they would have been without conservation
- Report posted at:  
[www.financingsustainablewater.org](http://www.financingsustainablewater.org)



## Financial Instruments to Manage Revenue Risk

A new white paper explores opportunities for utilities to use financial instruments - such as derivatives, insurance and bonds - to manage weather-related revenue risk in an increasingly volatile climate.



## Rates. Revenue. Resources.

Financing Sustainable Water is an initiative of the Alliance for Water Efficiency that was created to provide practical information to guide utilities from development through implementation of rate structures that balance revenue management, resource efficiency and fiscal sustainability. Headquartered in Chicago, the Alliance serves as a North American advocate for water efficient products and programs, and provides information and assistance on water conservation efforts. [Learn More](#)



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Sustainable financial management guidance



### ELECTED OFFICIALS

Set your water utility up for success



### CONCERNED CITIZENS

Learn how you can help create a sustainable water future



### MEDIA

Get key facts on today's water challenges



### RATES HANDBOOK

Building Better Rates for an Uncertain World



### RATE MODEL

Sales Forecasting and Rate Model

### RECENT NEWS

- [Water or Water Service?](#) »
- [Demand Forecasting 101](#) »

### FEATURED RESOURCES

- [Case Study](#)  
Budget-based Rates
- [Case Study Hover Example](#)  
New case study title here