# This presentation premiered at WaterSmart Innovations

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# Water Conservation 2.0

## Large Scale Technology Upgrades for Existing Inspection Programs

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CENTER FOR ReSource CONSERVATION

SLOW the FLOW COLORADO

# Center for ReSource Conservation Overview

**CRC Mission**

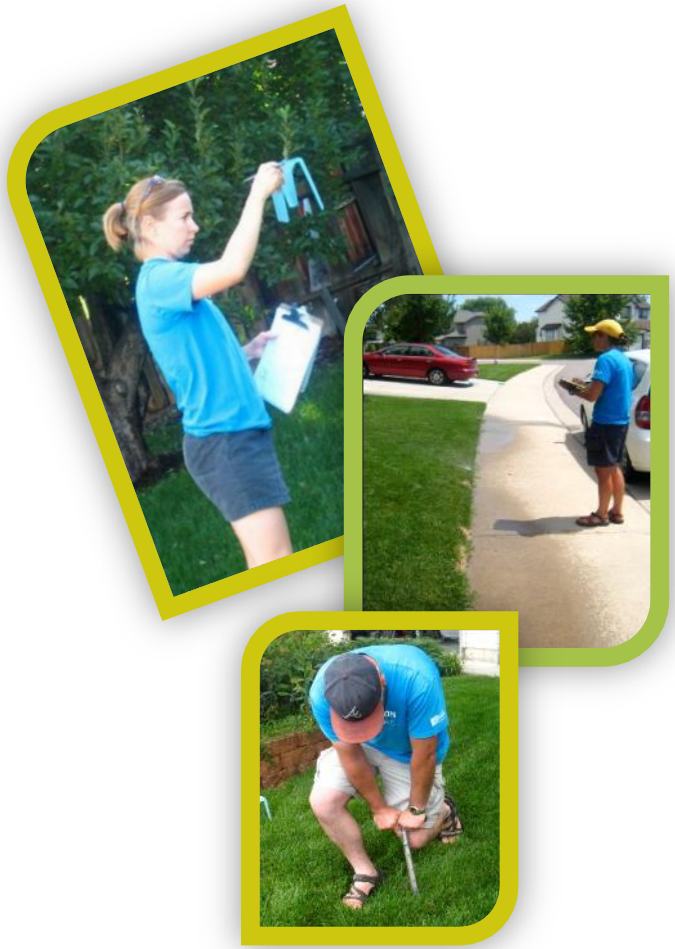
- Putting conservation into action

**CRC History**

- 35 year old nonprofit organization, founded by concerned citizens in 1976

# Slow the Flow Program Roots

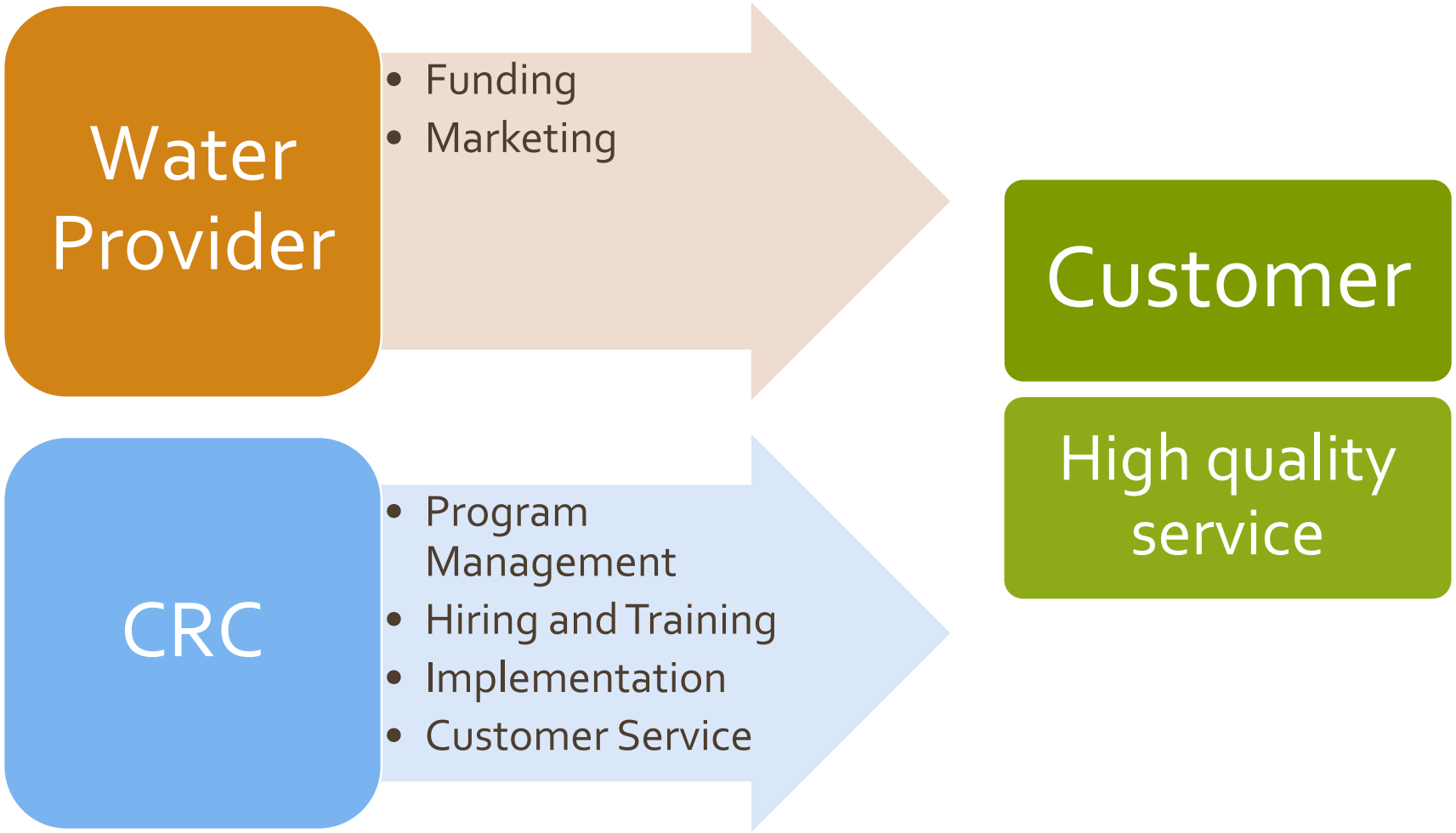
- Slow the Flow Save H20 - Utah
- Pilot Program of the City of Boulder in 2003
- CRC Run Since 2004
- Since 2007, Slow the Flow has been funded entirely by the participating water providers
  - 2004-2006 CWCB grant (55% utilities, 45% CWCB)
- **In 2014 24 water providers participated in Slow the Flow**
- **Over 19,000 homes audited resulting in 285 million gallons of water saved**



# Steps of the Audit

1. Meet with Homeowner
2. Visual Inspection
3. Catch Cup Tests
4. Pressure Readings
5. Soil and Root Depth Tests
6. Landscape Measurements
7. Determine Watering Schedule
8. Share Test Results and Recommendations With Homeowner

## How it works


Water Provider
Funding
Marketing
CRC
Program Management
Hiring and Training
Implementation
Customer Service
Customer
High quality service

# Slow the Flow Partners





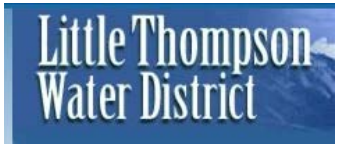














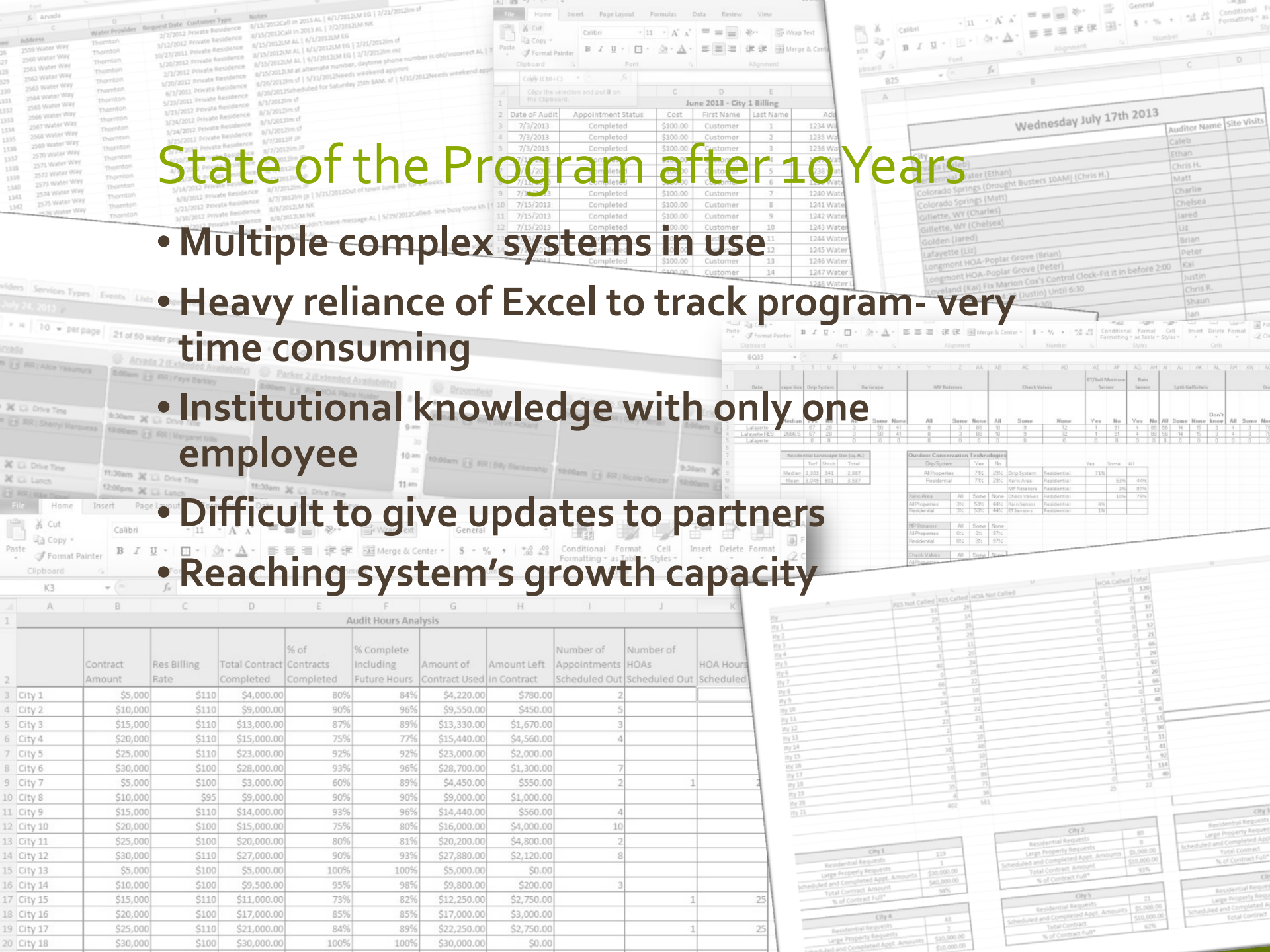




10 Years
19,000 Audits

# State of the Program after 10 Years

- Multiple complex systems in use
- Heavy reliance of Excel to track program- very time consuming
- Institutional knowledge with only one employee
- Difficult to give updates to partners
- Reaching system's growth capacity

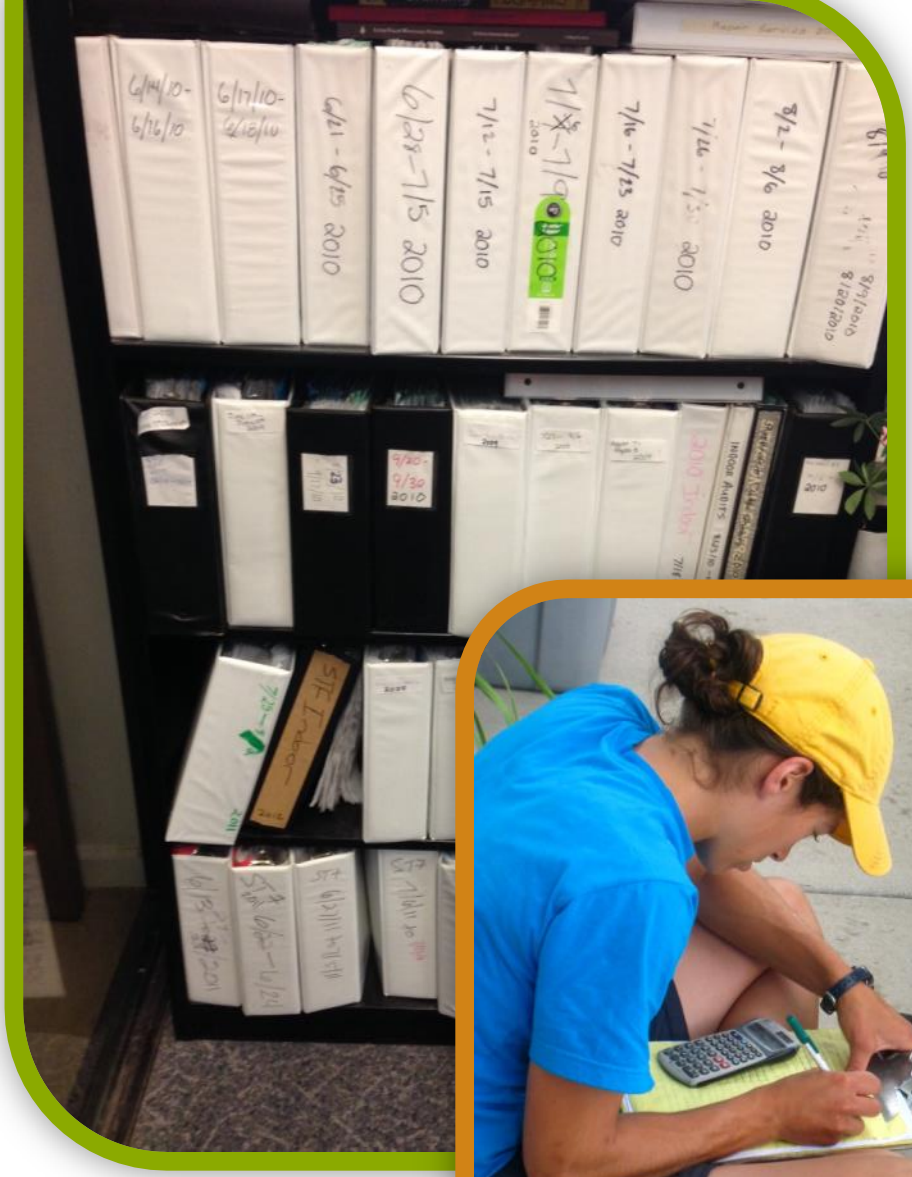


# Our Idea


- Conduct all audits with tablets
- Build software to merge scheduling/auditing and reporting functions

# Program Costs Addressed

- 30,000 sheets of paper each summer
- 300 hours of data entry
- 500 hours of manual calculations and re-copying information



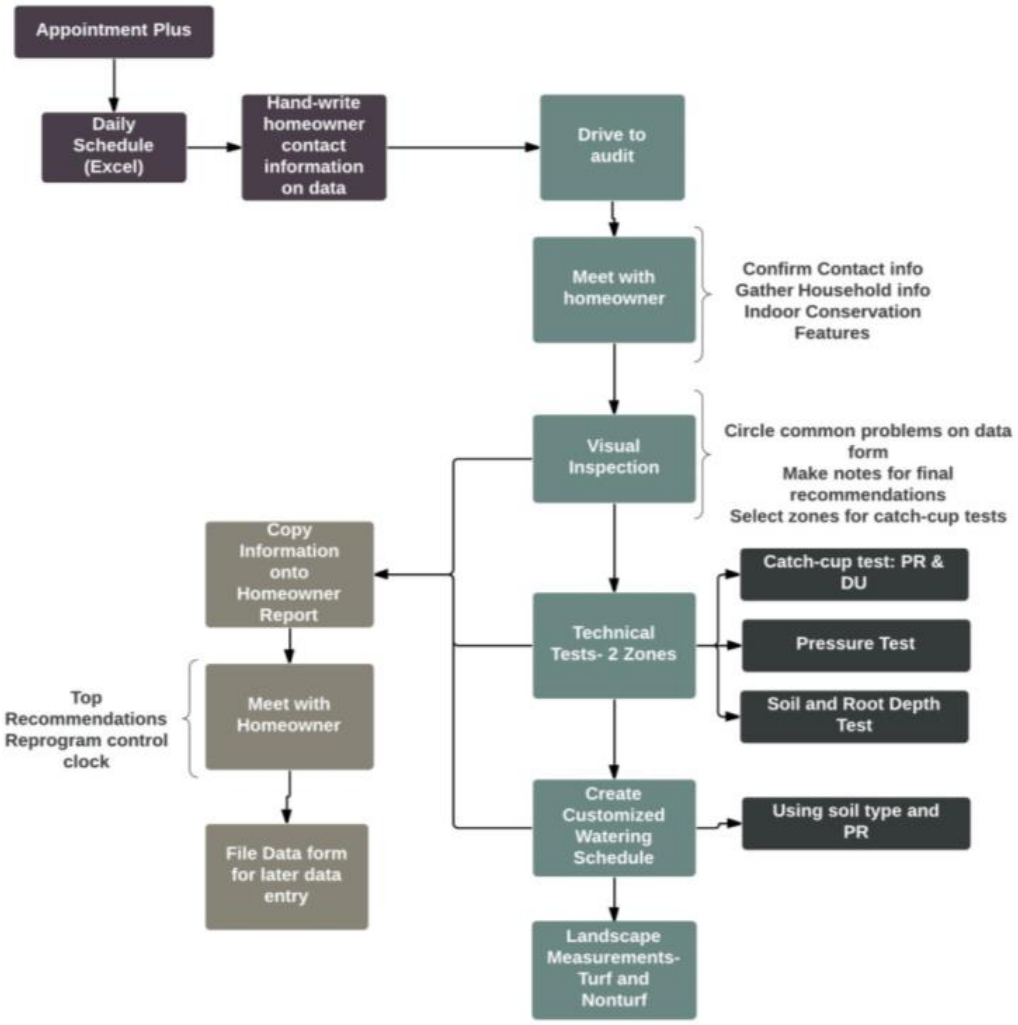
# Trial and Error

- 2012 Failed Trial- All about saving $
  - Attempted to use survey tool for audit information gathering
  - Purchased low end tablets
  - Did not fully scope project- looking at one piece

- Main lesson learned is that we need custom software!

# 2013 A Year for Investment

- CRC board and leadership decided to invest in the Slow the Flow program
- Formed a Slow the Flow upgrade task force
  - Made up of qualified, business and technology professionals
- Fully scoped project
  - Spent hours documenting every process and interconnection
- Used consultant to help us write an RFP

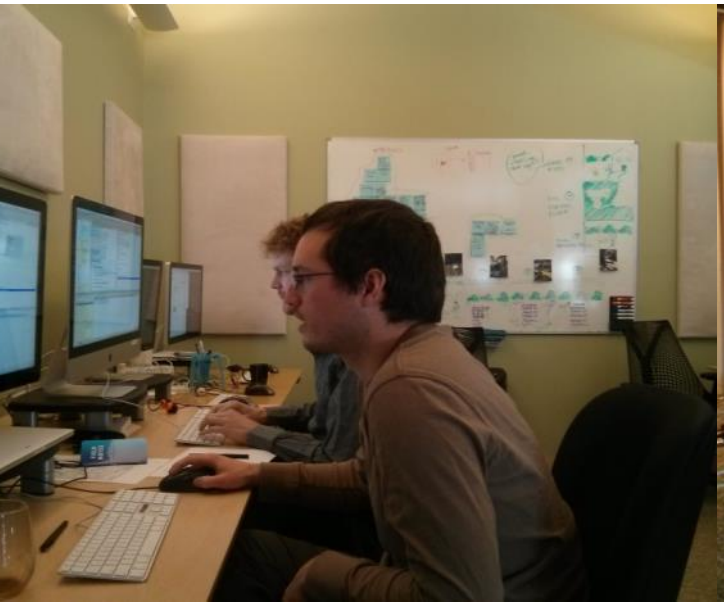


# Picking the Right Developer

- Evaluated all proposals on the following
  - Technical ability
  - Understanding of project and goals
  - Can they relate to non-tech people
  - Price
- Why we chose Pivotal Labs

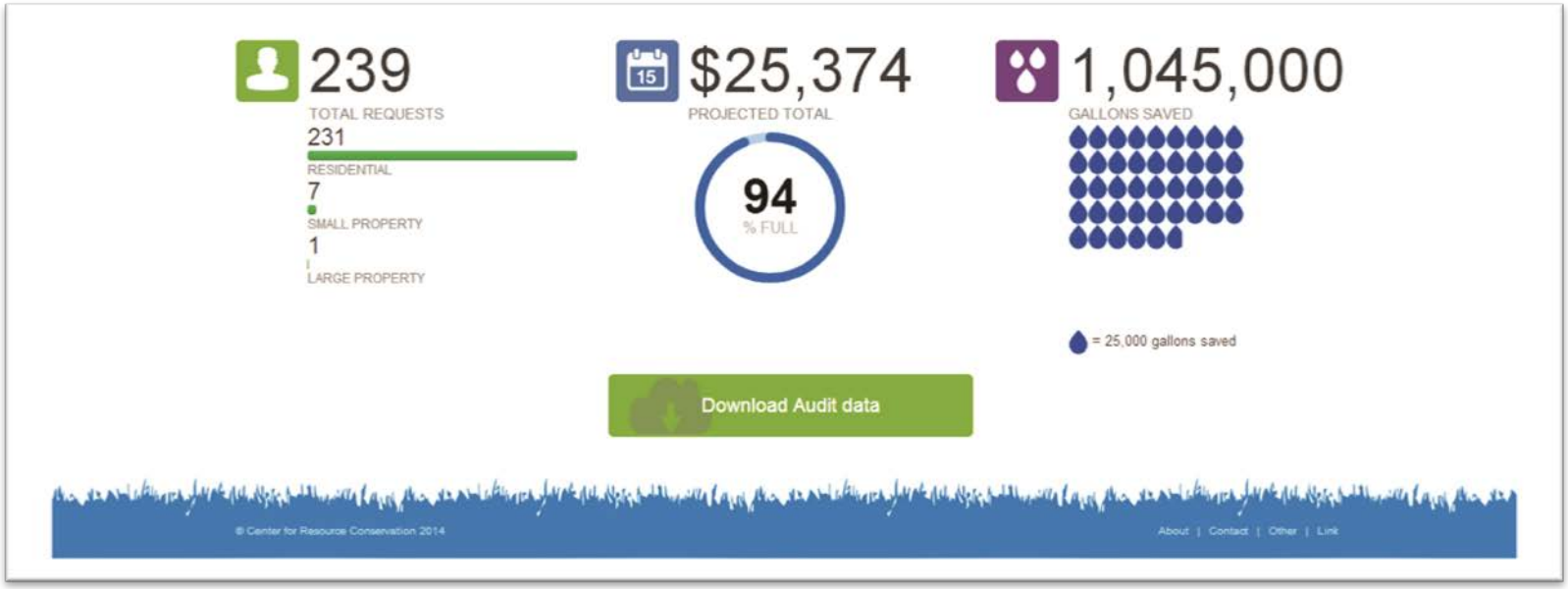
# Building a better mousetrap

- Intensive 6 week development phase, utilizing Agile development methodology
- Daily/Weekly progress meetings
- 90% of software built during this time

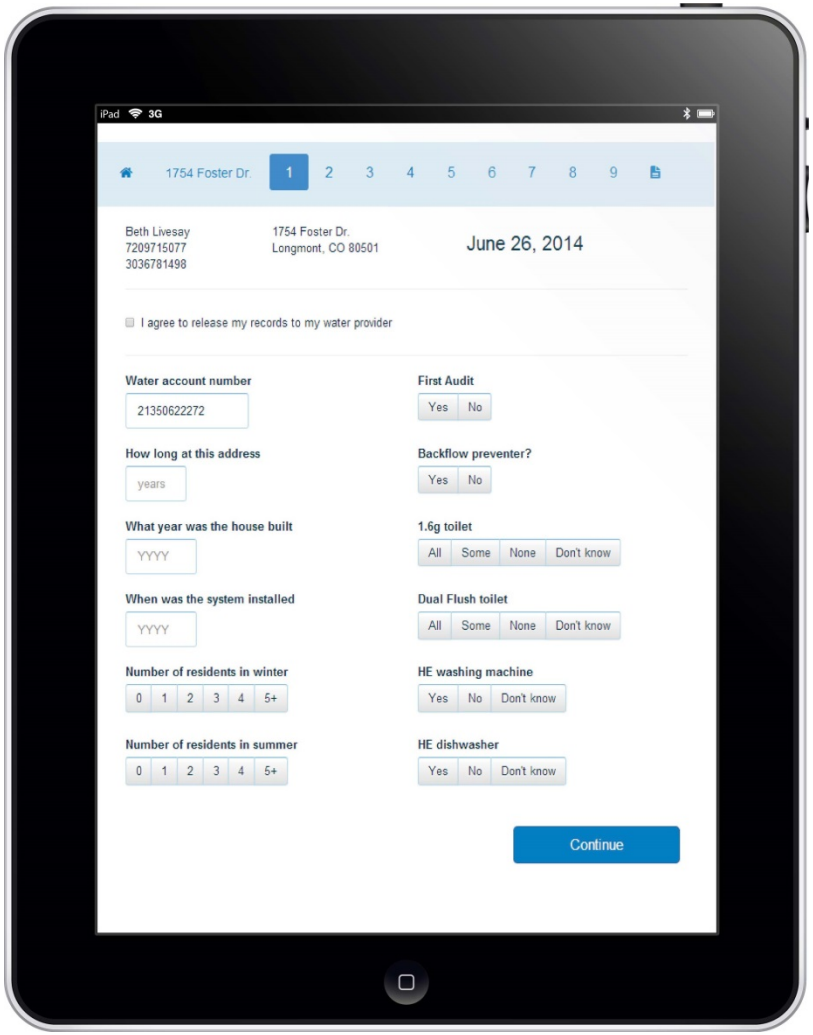


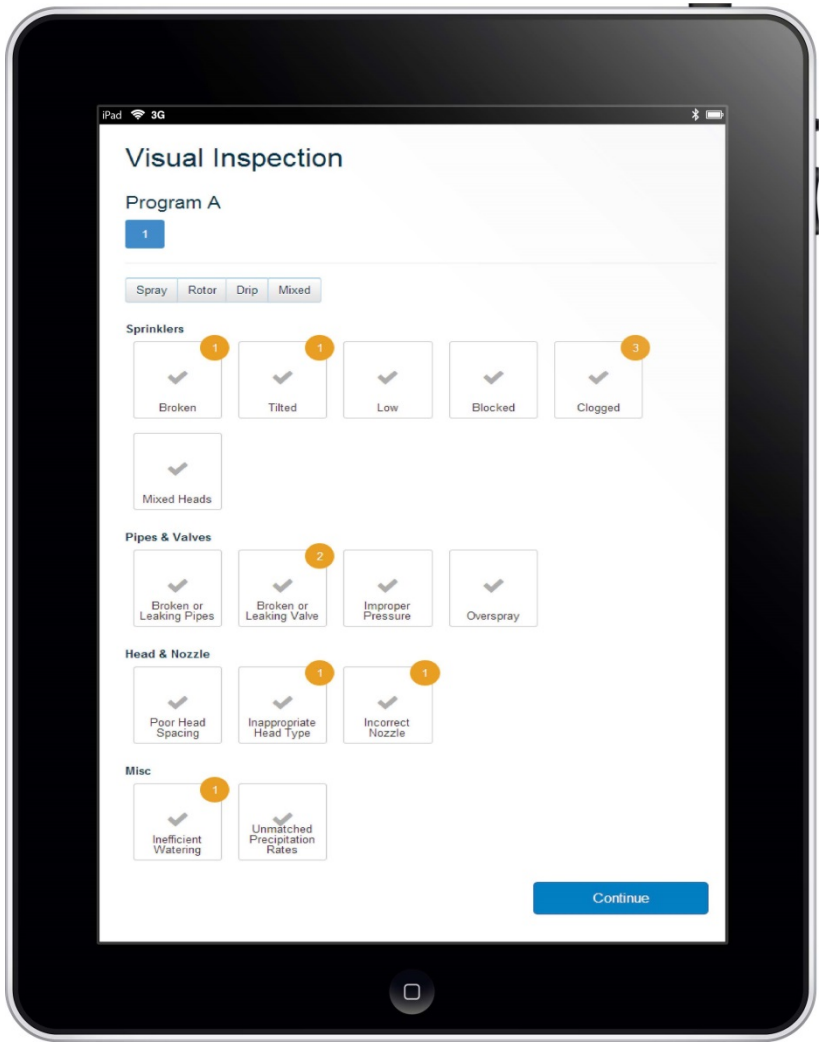
# Outcomes

- Fully integrated custom software
  - Offline Audit App
  - Scheduling
  - Customer Profile Management
  - Water Provider Dashboard
  - Easy reporting, exporting
  - Electronic homeowner report

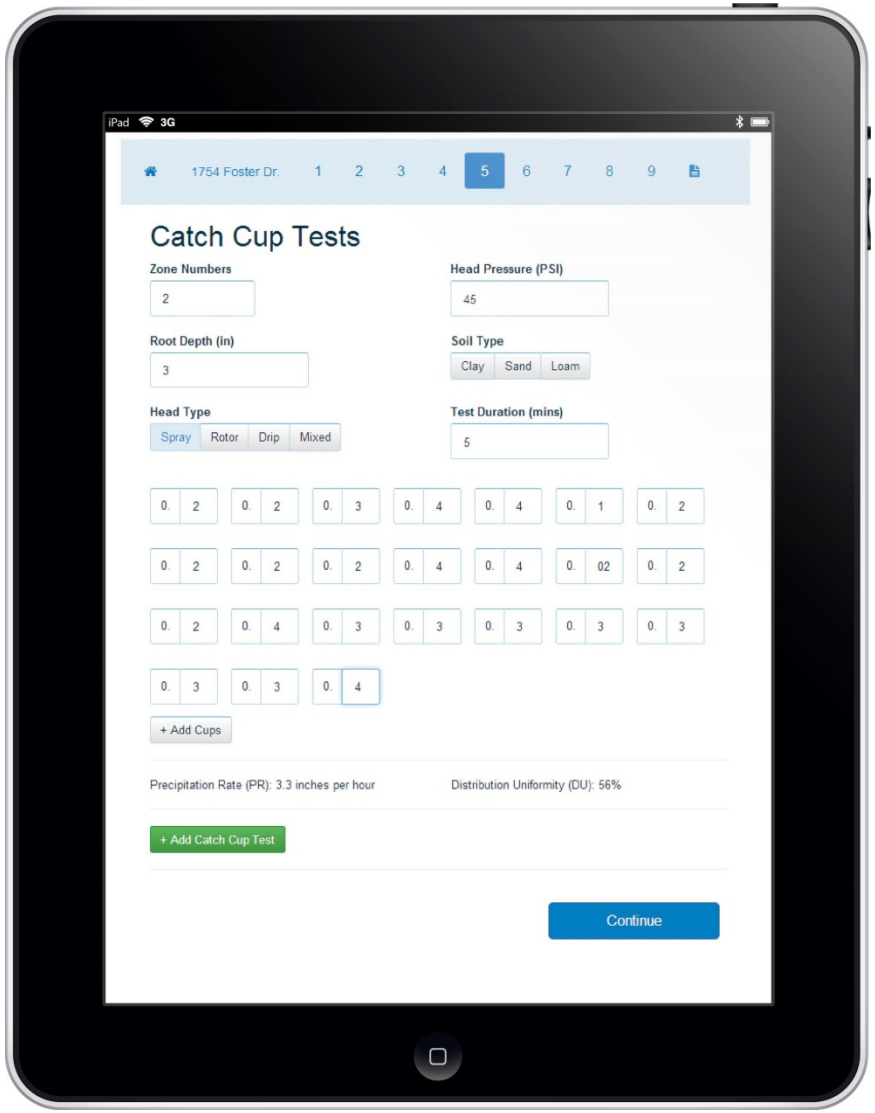


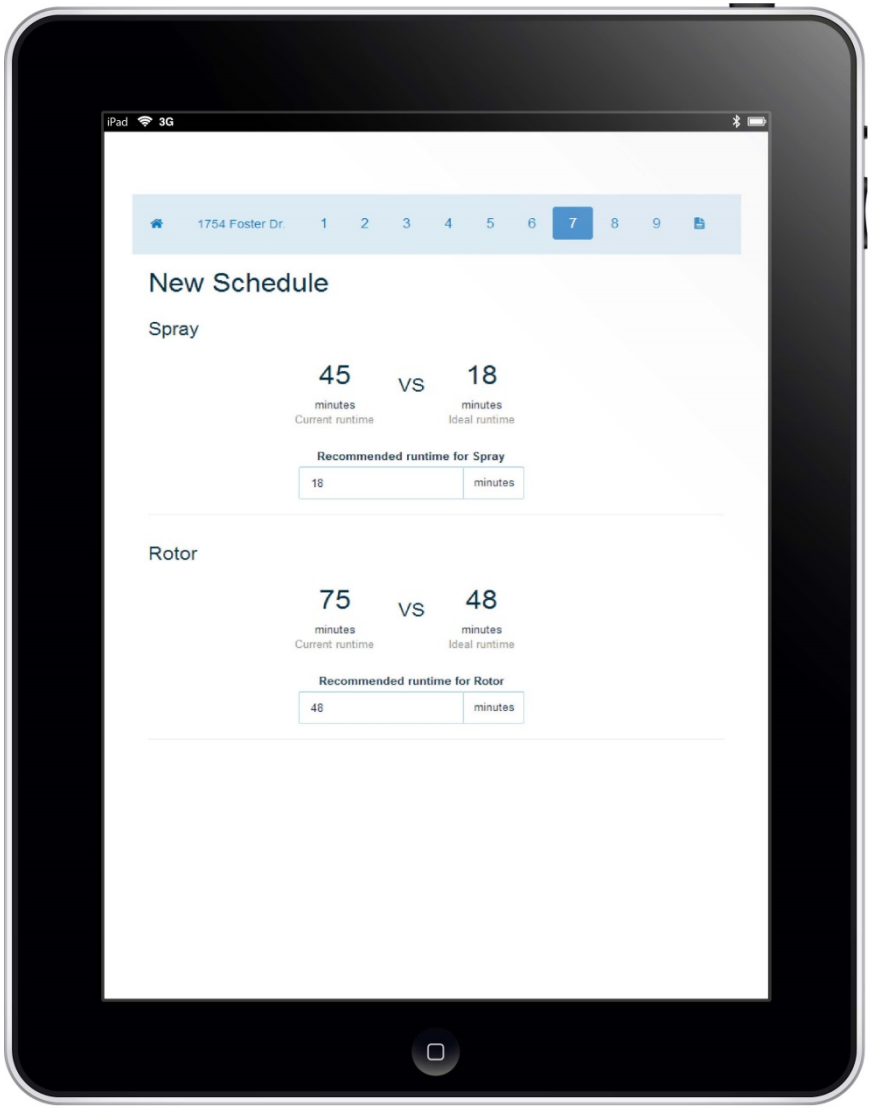
# Outcome: Audit App



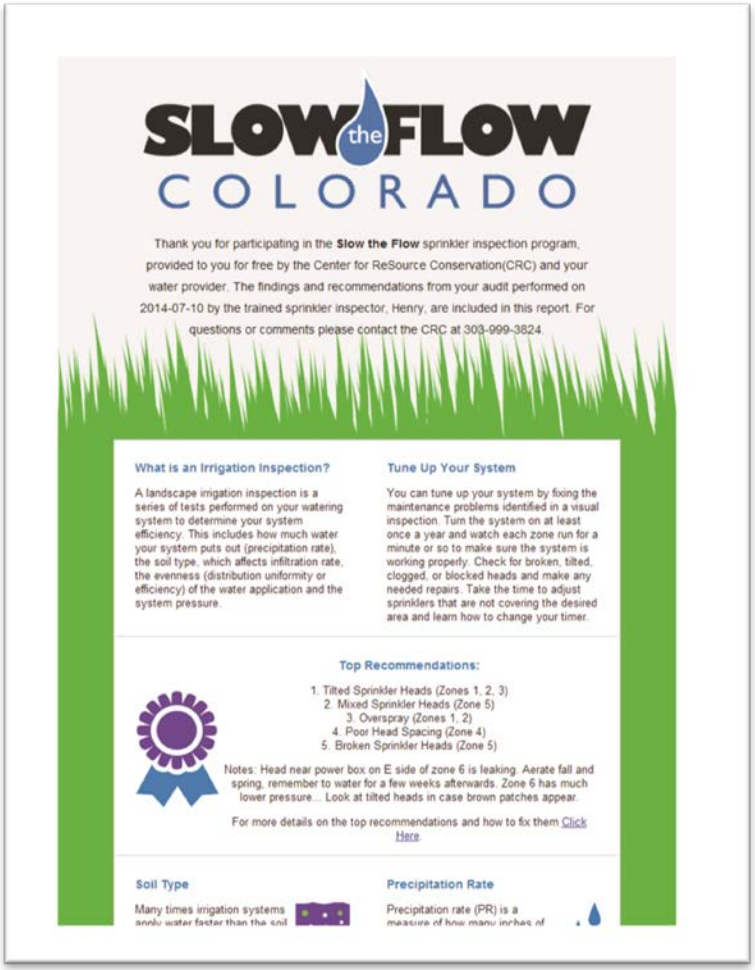



# Outcome: Audit App



# Outcome: Homeowner Report



SLOW the FLOW
COLORADO

Thank you for participating in the **Slow the Flow** sprinkler inspection program, provided to you for free by the Center for ReSource Conservation(CRC) and your water provider. The findings and recommendations from your audit performed on 2014-07-10 by the trained sprinkler inspector, Henry, are included in this report. For questions or comments please contact the CRC at 303-999-3824.

**What is an Irrigation Inspection?**

A landscape irrigation inspection is a series of tests performed on your watering system to determine your system efficiency. This includes how much water your system puts out (precipitation rate), the soil type, which affects infiltration rate, the evenness (distribution uniformity or efficiency) of the water application and the system pressure.

**Tune Up Your System**

You can tune up your system by fixing the maintenance problems identified in a visual inspection. Turn the system on at least once a year and watch each zone run for a minute or so to make sure the system is working properly. Check for broken, tilted, clogged, or blocked heads and make any needed repairs. Take the time to adjust sprinklers that are not covering the desired area and learn how to change your timer.

**Top Recommendations:**

1. Tilted Sprinkler Heads (Zones 1, 2, 3)
2. Mixed Sprinkler Heads (Zone 5)
3. Overspray (Zones 1, 2)
4. Poor Head Spacing (Zone 4)
5. Broken Sprinkler Heads (Zone 5)

Notes: Head near power box on E side of zone 6 is leaking. Aerate fall and spring, remember to water for a few weeks afterwards. Zone 6 has much lower pressure... Look at tilted heads in case brown patches appear.

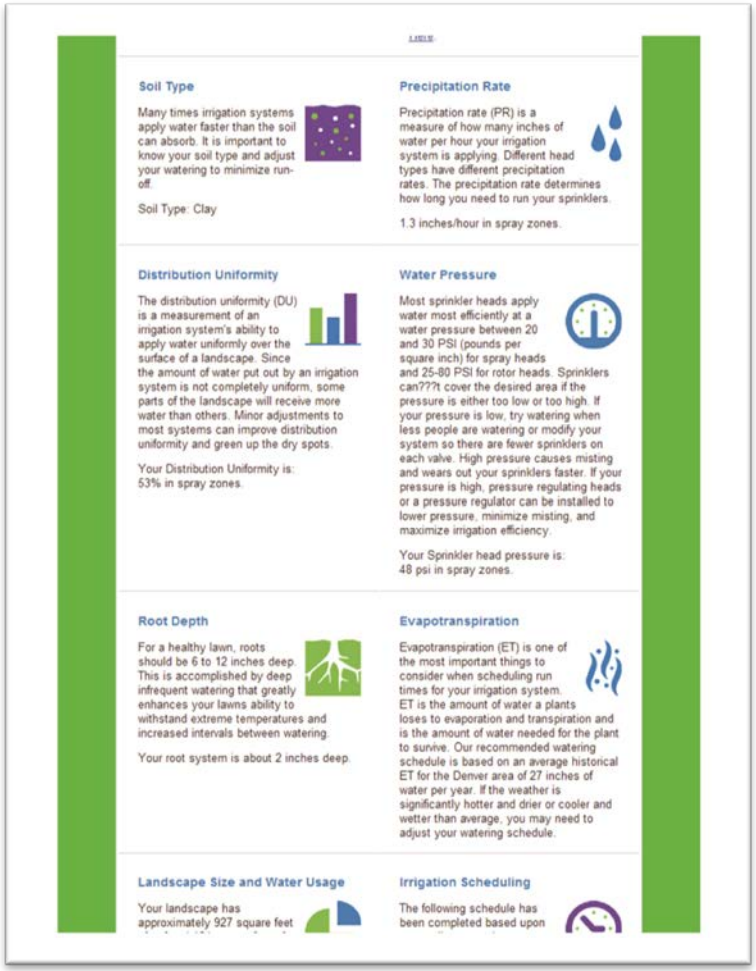
For more details on the top recommendations and how to fix them Click Here.

**Soil Type**

Many times irrigation systems

**Precipitation Rate**

Precipitation rate (PR) is a



**Soil Type**

Many times irrigation systems apply water faster than the soil can absorb. It is important to know your soil type and adjust your watering to minimize run-off.

Soil Type: Clay

**Precipitation Rate**

Precipitation rate (PR) is a measure of how many inches of water per hour your irrigation system is applying. Different head types have different precipitation rates. The precipitation rate determines how long you need to run your sprinklers.

1.3 inches/hour in spray zones.

**Distribution Uniformity**

The distribution uniformity (DU) is a measurement of an irrigation system's ability to apply water uniformly over the surface of a landscape. Since the amount of water put out by an irrigation system is not completely uniform, some parts of the landscape will receive more water than others. Minor adjustments to most systems can improve distribution uniformity and green up the dry spots.

Your Distribution Uniformity is: 53% in spray zones.

**Water Pressure**

Most sprinkler heads apply water most efficiently at a water pressure between 20 and 30 PSI (pounds per square inch) for spray heads and 25-80 PSI for rotor heads. Sprinklers can???t cover the desired area if the pressure is either too low or too high. If your pressure is low, try watering when less people are watering or modify your system so there are fewer sprinklers on each valve. High pressure causes misting and wears out your sprinklers faster. If your pressure is high, pressure regulating heads or a pressure regulator can be installed to lower pressure, minimize misting, and maximize irrigation efficiency.

Your Sprinkler head pressure is: 48 psi in spray zones.

**Root Depth**

For a healthy lawn, roots should be 6 to 12 inches deep. This is accomplished by deep infrequent watering that greatly enhances your lawns ability to withstand extreme temperatures and increased intervals between watering.

Your root system is about 2 inches deep.

**Evapotranspiration**

Evapotranspiration (ET) is one of the most important things to consider when scheduling run times for your irrigation system. ET is the amount of water a plants loses to evaporation and transpiration and is the amount of water needed for the plant to survive. Our recommended watering schedule is based on an average historical ET for the Denver area of 27 inches of water per year. If the weather is significantly hotter and drier or cooler and wetter than average, you may need to adjust your watering schedule.

**Landscape Size and Water Usage**

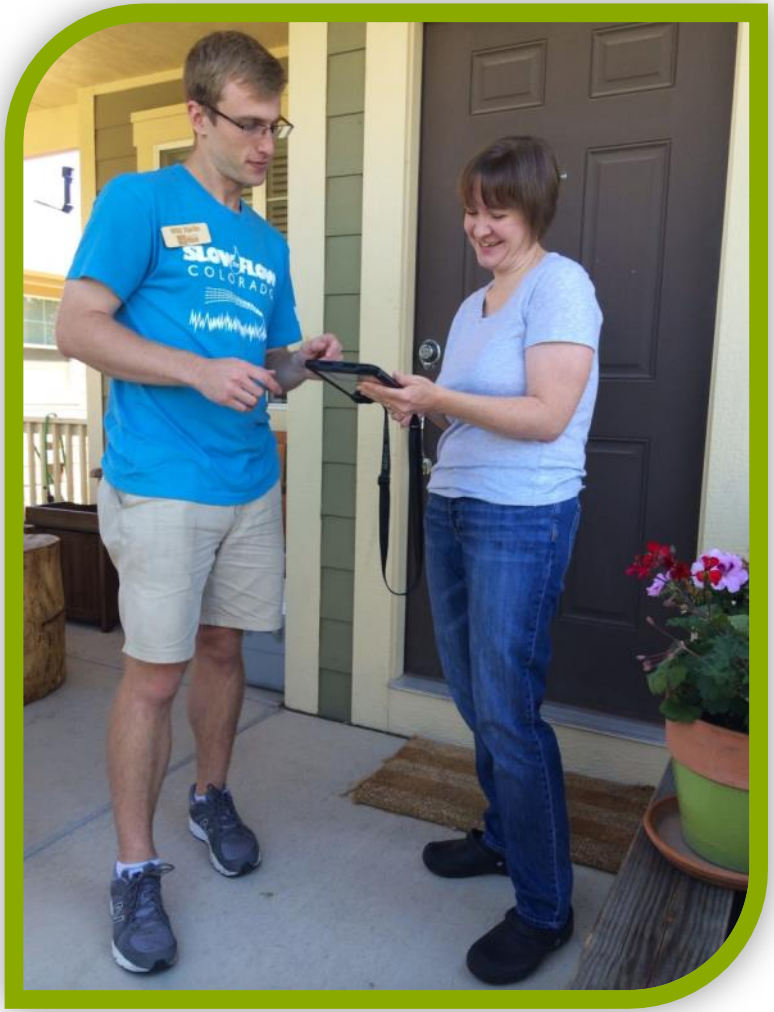
Your landscape has approximately 927 square feet

**Irrigation Scheduling**

The following schedule has been completed based upon

# Software Roll-out

- In June of 2014 15 auditors began doing audits on iPad Minis
- Successfully completed over 1,700 audits using new software



# Program Savings

- Eliminated need for manual calculations/ re-copying information
- Savings of over 15 minutes per audit
- Auditors able go from 4 to 5 audits per day
- Send and resend reports instantly
- Ability for water provider partners to log-in and view the audit information in their community
- Now completely paperless!
- 10% cost savings in first year

# What's Next

- Gathering feedback from all our stakeholders
- Prioritizing changes to software over the winter/spring
- Moving other CRC programs into the software

# Lessons Learned

- Spend the time up front to figure out exactly what you need
  - Document, document, document!
- Look at the whole system, integrated is better
- Find the most talented people you can for the budget you have!
- You get what you pay for (both software and hardware)

# Questions?

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