

This presentation premiered at WaterSmart Innovations

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AMII

The GOOD intentions

The BAD apples

and the UGLY side of knowing too much

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Somewher
e over the
rainbow...





The background of the slide features a series of thin, vertical, slightly wavy lines in various shades of gray and green, creating a textured, rain-like effect. A solid, medium-green horizontal band spans the width of the slide, positioned below the main background pattern. The title text is centered within this band.

System Background

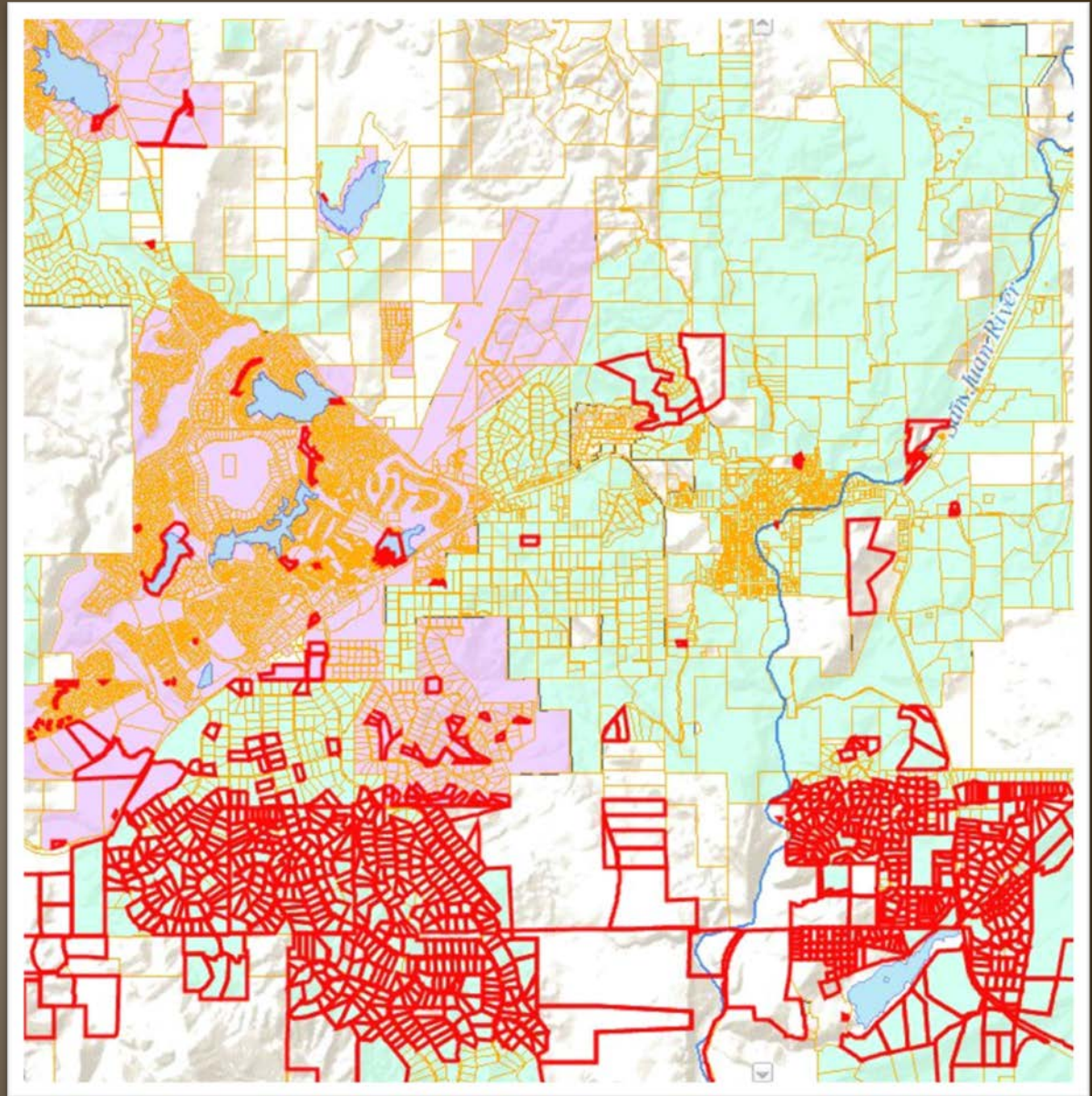
PAWSD service area

Approx. 12,000 residents

5423 connections

290 miles of water lines

90 miles of wastewater lines



AMR vs. AMI (as I understand it...)

AMR

- Automatic Meter Reading
- Meter reads are collected in the field via a mobile device.
- Generally a snapshot in time – what the meter reads NOW.

AMI

- Automated Metering Infrastructure
- Meter reads are sent directly to the provider.
- Provides daily/hourly meter reads in near real-time.

Demand-side Leak Detection

- Identify customer leaks
- Initiate customer contact
- Arrange for assistance
- Save water, save money...and sometimes more.

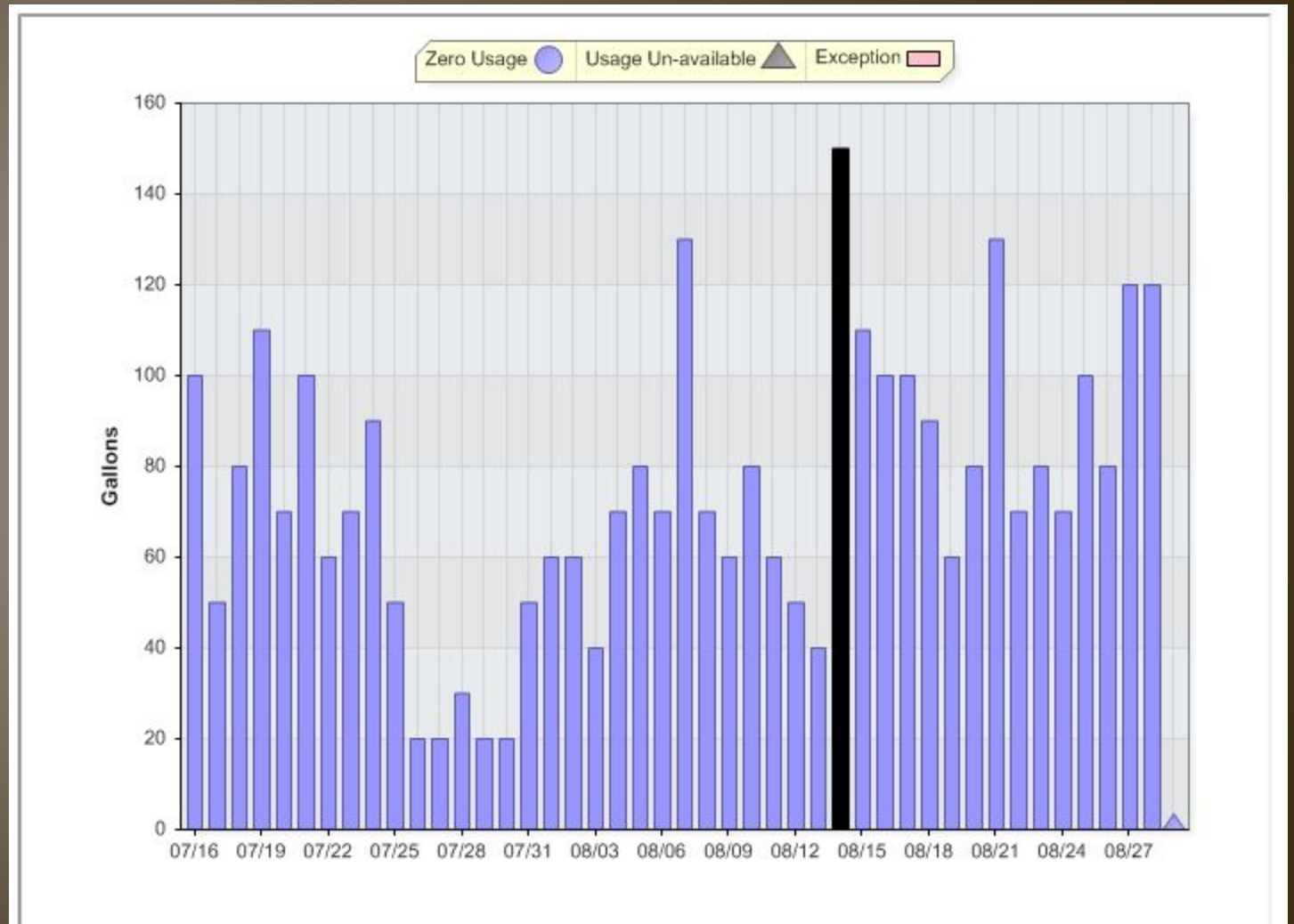
Datamatic Mosaic Meter Detail

Water use under
“normal” conditions

1 2 3 4 5 6 7 8 9 10 ... >>				
Read Time	Gateway	Read	Trouble Code	Consumption
08-29 01:00 AM	10002391	9210	-	0
08-29 12:00 AM	10002391	9210	-	0
08-28 11:00 PM	10002391	9210	-	20
08-28 10:00 PM	10002391	9190	-	0
08-28 09:00 PM	10002391	9190	-	0
08-28 08:00 PM	10002391	9190	-	0
08-28 07:00 PM	10002391	9190	-	20
08-28 06:00 PM	10002391	9170	-	0
08-28 05:00 PM	10002391	9170	-	10
08-28 04:00 PM	10002391	9160	-	0
08-28 03:00 PM	10002391	9160	-	0
08-28 02:00 PM	10002391	9160	-	0
08-28 01:00 PM	10002391	9160	-	10
08-28 12:00 PM	10002391	9150	-	20
08-28 11:00 AM	10002391	9130	-	0
08-28 10:00 AM	10002391	9130	-	30
08-28 09:00 AM	10002391	9100	-	0
08-28 08:00 AM	10002391	9100	-	10
08-28 07:00 AM	10002391	9090	-	0
08-28 06:00 AM	10002391	9090	-	0
08-28 05:00 AM	10002391	9090	-	0
08-28 04:00 AM	10002391	9090	-	0
08-28 03:00 AM	10002391	9090	-	0
08-28 02:00 AM	10002391	9090	-	0
08-28 01:00 AM	10002391	9090	-	0
08-28 12:00 AM	10002391	9090	-	0
08-27 11:00 PM	10002391	9090	-	0
08-27 10:00 PM	10002391	9090	-	0
08-27 09:00 PM	10002391	9090	-	0
08-27 08:00 PM	10002391	9090	-	30
08-27 07:00 PM	10002391	9060	-	0
08-27 06:00 PM	10002391	9060	-	10
08-27 05:00 PM	10002391	9050	-	10
08-27 04:00 PM	10002391	9040	-	30
08-27 03:00 PM	10002391	9010	-	0
08-27 02:00 PM	10002391	9010	-	10
08-27 01:00 PM	10002391	9000	-	10
08-27 12:00 PM	10002391	8990	-	0
08-27 11:00 AM	10002391	8990	-	0
08-27 10:00 AM	10002391	8990	-	0
08-27 09:00 AM	10002391	8990	-	10
08-27 08:00 AM	10002391	8980	-	10
08-27 07:00 AM	10002391	8970	-	0
08-27 06:00 AM	10002391	8970	-	0
08-27 05:00 AM	10002391	8970	-	0
08-27 04:00 AM	10002391	8970	-	0
08-27 03:00 AM	10002391	8970	-	0
08-27 02:00 AM	10002391	8970	-	0
08-27 01:00 AM	10002391	8970	-	0
08-27 12:00 AM	10002391	8970	-	0
1 2 3 4 5 6 7 8 9 10 ... >>				

Processing time: 6 seconds

Datamatic Profile Graph



Leaks

1 2 3 4 5 6 7 8 9 10 ... >>				
Read Time	Gateway	Read	Trouble Code	Consumption
08-14 11:00 AM	300117	186300	-	390
08-14 10:00 AM	300117	185910	-	380
08-14 09:00 AM	300117	185530	-	380
08-14 08:00 AM	300117	185150	-	380
08-14 07:00 AM	300117	184770	-	380
08-14 06:00 AM	300117	184390	-	380
08-14 05:00 AM	300117	184010	-	390
08-14 04:00 AM	300117	183620	-	380
08-14 03:00 AM	300117	183240	-	380
08-14 02:00 AM	300117	182860	-	380
08-14 01:00 AM	300117	182480	-	380
08-14 12:00 AM	300117	182100	-	390
08-13 11:00 PM	300117	181710	-	380
08-13 10:00 PM	300117	181330	-	380
08-13 09:00 PM	300117	180950	-	380
08-13 08:00 PM	300117	180570	-	390
08-13 07:00 PM	300117	180180	-	380
08-13 06:00 PM	300117	179800	-	380
08-13 05:00 PM	300117	179420	-	390
08-13 04:00 PM	300117	179030	-	380
08-13 03:00 PM	300117	178650	-	390
08-13 02:00 PM	300117	178260	-	380
08-13 01:00 PM	300117	177880	-	380
08-13 12:00 PM	300117	177500	-	280
08-13 11:00 AM	300117	177220	-	0
08-13 10:00 AM	300117	177220	-	0
08-13 09:00 AM	300117	177220	-	0
08-13 08:00 AM	300117	177220	-	0
08-13 07:00 AM	300117	177220	-	0
08-13 06:00 AM	300117	177220	-	0
08-13 05:00 AM	300117	177220	-	0
08-13 04:00 AM	300117	177220	-	0
08-13 03:00 AM	300117	177220	-	0
08-13 02:00 AM	300117	177220	-	0
08-13 01:00 AM	300117	177220	-	0
08-13 12:00 AM	300117	177220	-	0
08-12 11:00 PM	300117	177220	-	0
08-12 10:00 PM	300117	177220	-	0
08-12 09:00 PM	300117	177220	-	0
08-12 08:00 PM	300117	177220	-	0
08-12 07:00 PM	300117	177220	-	0
08-12 06:00 PM	300117	177220	-	0
08-12 05:00 PM	300117	177220	-	0
08-12 04:00 PM	300117	177220	-	0
08-12 03:00 PM	300117	177220	-	0
08-12 02:00 PM	300117	177220	-	0
08-12 01:00 PM	300117	177220	-	0
08-12 12:00 PM	300117	177220	-	0
08-12 11:00 AM	300117	177220	-	0
08-12 10:00 AM	300117	177220	-	0
1 2 3 4 5 6 7 8 9 10 ... >>				

Processing time: 6 seconds

Records: 1058

Go To Date: 08/29/2012

Save As: [CSV](#) | [XLS](#)

1 2 3 4 5 6 7 8 9 10 ... >>				
Read Time	Gateway	Read	Trouble Code	Consumption
08-16 01:00 PM	300117	194450	-	0
08-16 12:00 PM	300117	194450	-	0
08-16 11:00 AM	300117	194450	-	0
08-16 10:00 AM	300117	194450	-	0
08-16 09:00 AM	300117	194450	-	0
08-16 08:00 AM	300117	194450	-	0
08-16 07:00 AM	300117	194450	-	0
08-16 06:00 AM	300117	194450	-	0
08-16 05:00 AM	300117	194450	-	0
08-16 04:00 AM	300117	194450	-	0
08-16 03:00 AM	300117	194450	-	0
08-16 02:00 AM	300117	194450	-	0
08-16 01:00 AM	300117	194450	-	0
08-15 12:00 AM	300117	194450	-	0
08-15 11:00 PM	300117	194450	-	0
08-15 10:00 PM	300117	194450	-	0
08-15 09:00 PM	300117	194450	-	0
08-15 08:00 PM	300117	194450	-	0
08-15 07:00 PM	300117	194450	-	0
08-15 06:00 PM	300117	194450	-	0
08-15 05:00 PM	300117	194450	-	0
08-15 04:00 PM	300117	194450	-	0
08-15 03:00 PM	300117	194450	-	0
08-15 02:00 PM	300117	194450	-	0
08-15 01:00 PM	300117	194450	-	0
08-15 12:00 PM	300117	194450	-	0
08-15 11:00 AM	300117	194450	-	0
08-15 10:00 AM	300117	194450	-	0
08-15 09:00 AM	300117	194450	LEAK	180
08-15 08:00 AM	300117	194270	LEAK	380
08-15 07:00 AM	300117	193890	LEAK	370
08-15 06:00 AM	300117	193520	LEAK	380
08-15 05:00 AM	300117	193140	LEAK	380
08-15 04:00 AM	300117	192760	LEAK	380
08-15 03:00 AM	300117	192380	LEAK	380
08-15 02:00 AM	300117	192000	LEAK	380
08-15 01:00 AM	300117	191620	LEAK	380
08-15 12:00 AM	300117	191240	LEAK	380
08-14 11:00 PM	300117	190860	LEAK	380
08-14 10:00 PM	300117	190480	LEAK	380
08-14 09:00 PM	300117	190100	LEAK	380
08-14 08:00 PM	300117	189720	LEAK	380
08-14 07:00 PM	300117	189340	LEAK	380
08-14 06:00 PM	300117	188960	LEAK	380
08-14 05:00 PM	300117	188580	LEAK	380
08-14 04:00 PM	300117	188200	LEAK	380
08-14 03:00 PM	300117	187820	LEAK	380
08-14 02:00 PM	300117	187440	LEAK	380
08-14 01:00 PM	300117	187060	LEAK	380
08-14 12:00 PM	300117	186680	LEAK	380
1 2 3 4 5 6 7 8 9 10 ... >>				

Processing time: 6 seconds

Leak Parameters

- The system will “flag” a leak based upon established parameters.
- PAWSD leak parameters
 - The meter must pass water each hour for 24 consecutive hours

PROS

- generally eliminates false flags
(e.g. Irrigation)
- indicative of a true Leak

CONS

- Water must run for 24 hours
- Could be 10 gallons/hour or could be 1000 gallons/hour

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The GOOD intentions

Demand-side Leak Detection

- Saves Water
- Saves Money
- Saves Face

Saves Water

- The sooner unintentional water use can be stopped, the better.
- Decreases overall system demand which extends the usability of current water supplies.



Saves Money

- Someone has to pay for the water.
 - If it is not the property owner, then it is the community.
- The sooner the leak stops, the better.
 - Wasted water is just that...wasted.
 - Nobody wants to pay for water that wasn't "used".
- Both customer and provider benefit.
 - Customer is made aware as early as possible thus reducing the financial impact potential.
 - Providers benefit by keeping the afore mentioned customer out of the office demanding to know why their bill is soooooooo high.
- Decreasing demand allows Providers to extend the life of water treatment facilities.

Saves Face

- Proactively contacting customers regarding potential leaks shows genuine concern for the community.
- People like to know that the provider is “on their side”.
- Disputes are easily settled thanks to increased meter reading resolution.



The BAD apples

Actual customer statements

- “You should have caught my leak”
- “You knew about it and did nothing”
- “Well, your meter is wrong”
- “It is not my fault that your system sucks”



“You should have caught my leak”

- Provider Responsibility vs. Property Owner Responsibility
 - Demand-side leak detection blurs the line between the two
- Casting blame is easy. Finding a solution is difficult
- Be the professional that you are
 - Listen
 - Offer assistance
 - Listen
 - Provide necessary data and materials
 - Listen
 - Be firm while being empathetic

“You knew about it and did nothing”

- As a matter of Health and Safety, Colorado law prohibits a water provider from simply turning water off without just cause and/or proper notification.
- As a matter of policy, PAWSD will not turn water off without the property owners permission unless there is obvious damage being done.





“Well, your meter is wrong”

- Bench-testing a meter is time consuming and costly.
 - If the meter is old, simply replace it.
- Put your money where your mouth is!
 - PAWSD policy now makes the accusing property owner responsible for the cost should the meter come back 95% accurate (or greater).



“It is not my fault that your system sucks”

“I am NOT going to pay for this”

“I know what goes on down there”

“You’ll be hearing from my lawyer”



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The UGLY side of knowing too
much

Assumptions

Obligations

Legalities

At the end of the day...

Assumptions

- Data is data.
- Assumptions are dangerous.
 - A 10 gallon/hour leak is mostly likely a leaky toilet, but it could also be something much more.
- We all know what happens when we assume.
- Stick to the facts.



Obligations

- Help
- Notify the property owner
 - When the leak started
 - How much water has passed
 - It is not your job to solve the problem
- Stop the leak
 - Issue a service order for a technician to help out
 - Provide guidance to the property owner (“check your toilets...”)
 - Turn the water off at the meter

Legalities

- Provider responsibility vs. Property Owner responsibility
 - Generally the Provider's responsibility ends at the meter.
 - Demand-side leak detection crosses that boundary
 - The Provider has the resolution and capability to detect a problem.
 - The Provider has the means to correct/end the problem.
 - Doing nothing could be considered Negligence.
- Negligence
 - General Definition – *a failure to exercise the care that a reasonably prudent person would exercise in like circumstances.*
 - Legal Definition - *Conduct that falls below the standards of behavior established by law for the protection of others against unreasonable risk of harm. A person has acted negligently if he or she has departed from the conduct expected of a reasonably prudent person acting under similar circumstances.*
 - *In order to establish negligence as a Cause of Action under the law of TORTS, a plaintiff must prove that the defendant had a duty to the plaintiff, the defendant breached that duty by failing to conform to the required standard of conduct, the defendant's negligent conduct was the cause of the harm to the plaintiff, and the plaintiff was, in fact, harmed or damaged.*

- Negligence (cont'd)

- **General Definition – a failure to exercise the care that a reasonably prudent person would exercise in like circumstances.**
- Legal Definition - *Conduct that falls below the standards of behavior established by law for the protection of others against unreasonable risk of harm. A person has acted negligently if he or she has departed from the conduct expected of a reasonably prudent person acting under similar circumstances.*
- *In order to establish negligence as a Cause of Action under the law of TORTS, a plaintiff must prove that the defendant had a duty to the plaintiff, the defendant breached that duty by failing to conform to the required standard of conduct, the defendant's negligent conduct was the cause of the harm to the plaintiff, and the plaintiff was, in fact, harmed or damaged.*

- Negligence (cont'd)

- Duty of Care

- Does the Provider have a DUTY to care for the persons and properties it serves?

- Breech of Duty

- If the above is true, then the inaction on the part of the Provider to stop a known leak could be considered Negligence.

- Everyone Equal

- A provider has a responsibility to treat everyone equally.

At the end of the day...

- Cross your T's and dot your I's
- Be consistent and thorough
- Be empathetic yet firm
- Weigh the Pro's and Con's
- One bad apple can spoil the whole bunch

Thank you