

WATER FINANCIAL PLANNING

Tigard's Experience in Implementing Water Rates and SDCs Increases



Funding Strategy for the Lake Oswego/Tigard Water partnership

John Goodrich – Public Works Department

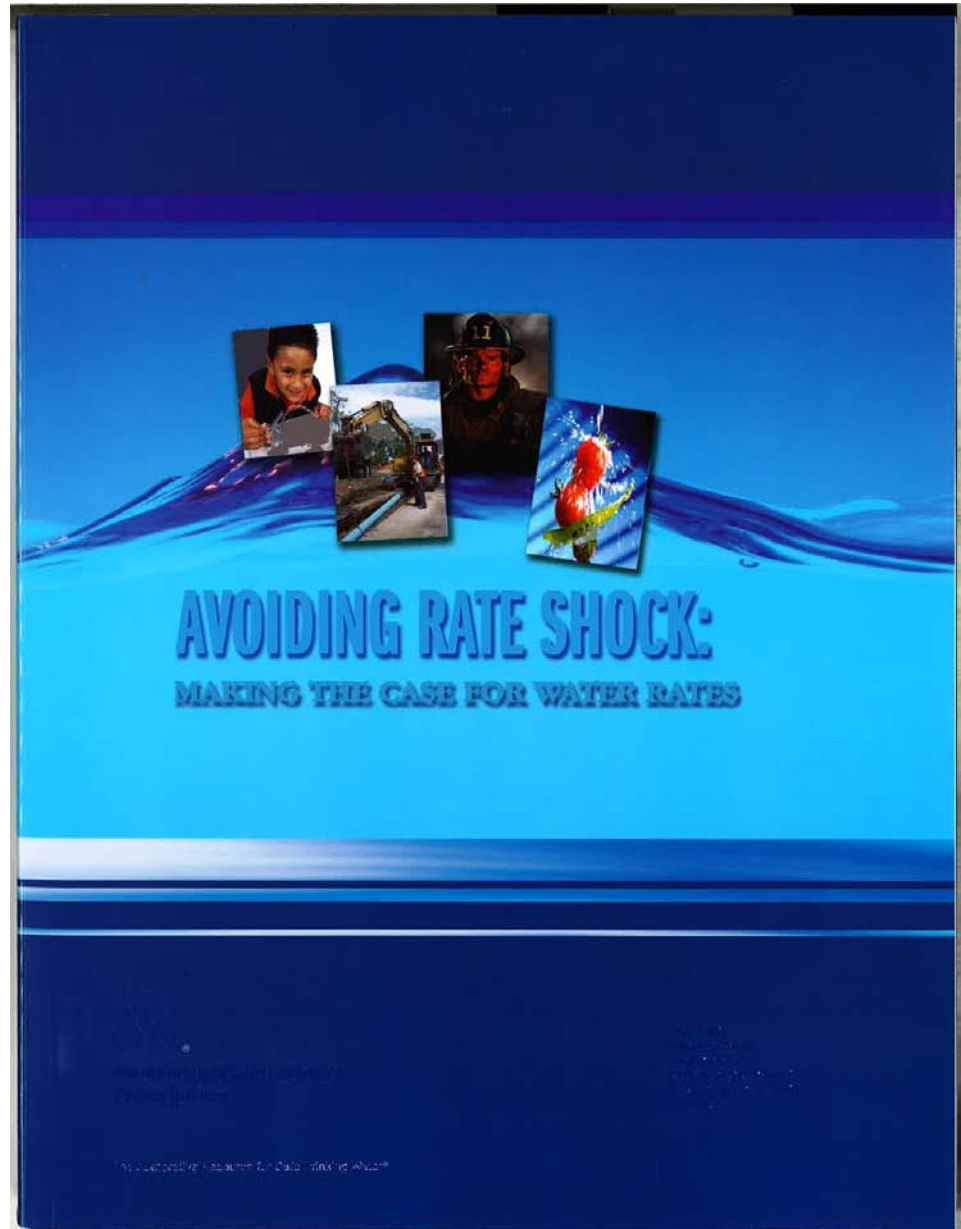
WATER RATE ARMAGEDDON

Nothing gets the attention
of the public like doubling
water rates!



Really, really, fast...

**Rate Payers are being asked
to pay the full cost of water –
Full Cost-of-Service Pricing**



Findings #1

People undervalue water, which compounds the challenge of getting rate increases accepted -

**Marketing the Value of Water
is essential**

Recommendations

- Know your customers – understand their attitudes and values
- Clearly explain the benefits of what the utility is trying to accomplish – use simple language and graphics-focused presentations
- Localize the message to community priorities
- Participate in local and regional water policy development

Findings #2

A consistent, structured communications outreach program builds credibility necessary to support the customer-utility relationship and, therefore, rate increases

—

Communicate!

Recommendations

- Formulate consistent messages based on customer perceptions – REPEAT THEM OFTEN!
- Develop and implement a Communications Plan – USE IT OFTEN!
- Involve employees as first line communicators with the public – DO THIS OFTEN!
- Celebrate and publicize projects or milestones – MARKET YOUR PRODUCT!

Findings #3

It's never too late to start doing the right thing –

Think long-term, and plan beyond the current crisis –

Really, the earlier you start the better!

Recommendations

- Check and re-check your budget and rate calculations – DO THIS OFTEN!
- Take timing of other events, like elections or other tax increases into consideration – NAVIGATE AROUND THEM!
- Adequately fund and staff communications – ASSIGN RESPONSIBILITY AND ACCOUNTABILITY!
- Avoid “rate management by crisis – THINK LONG TERM!
- Adopt a process for planning and implementing a rate increase – FINANCIAL POLICIES?

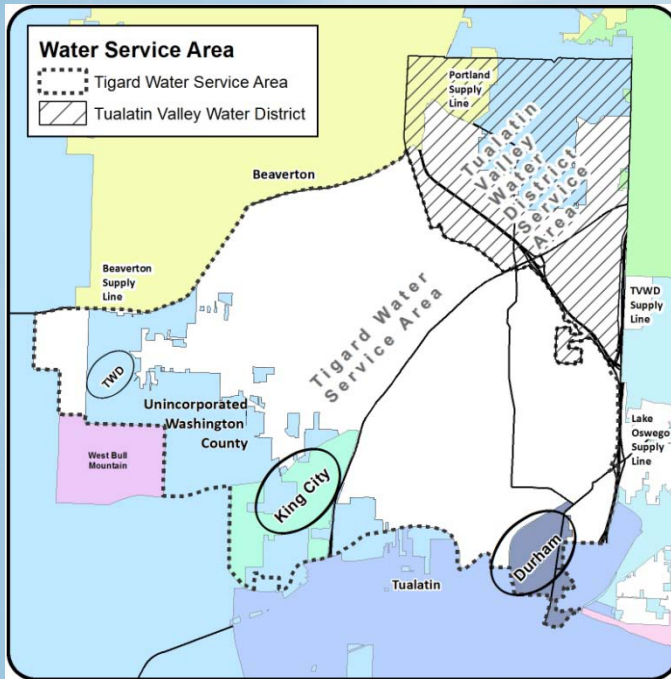
Findings #4

Billing practices and rate structure options can affect customer reactions and acceptance of rate increases

**Keep Customers smart,
not angry!**

Recommendations

- Clearly distinguish water charges from other portion of the bill – **WORK WITH FINANCE FOLKS!**
- Communicate and coordinate with other utilities for which you bill – **CONTROL OR COORDINATE!**
- Build outreach requirements into combined billing agreements – **EVERYONE CALLS IT A WATER BILL!**



Key Facts:

- 250 miles Ductile and Cast Pipe
- 2,041 Fire Hydrants
- 6,900 Valves
- 14 Reservoirs – 27 MG capacity
- 2 Aquifer Storage Recovery (ASR) Wells
- 17 Booster Pumps

Water Service Area:

Tigard, Durham, King City, and Tigard Water District

Managing Authority:

City of Tigard

Population Served:

57,724

Accounts:

18,063

(95% Residential/Multi-family)

Equivalent Dwelling Units (EDU):

29,000

Where Tigard has been...

- ▶ Attempted to develop an ownership stake in a drinking water source in 1998
- ▶ Joined the Tualatin Basin Joint Water Supply Project (TBJWS) in 1999 – left in 2007 due to limited water and delays
- ▶ Constructed Aquifer storage and recovery (ASR) in 2001 to meet growing water demands
- ▶ Negotiated 10 year contract with Portland in 2006, set to expire in 2016 with an automatic 10 year renewal
- ▶ Leader in water conservation for the last 10 years
- ▶ Finally partnered with Lake Oswego in August 2008 to expand their existing water supply system to meet both communities needs

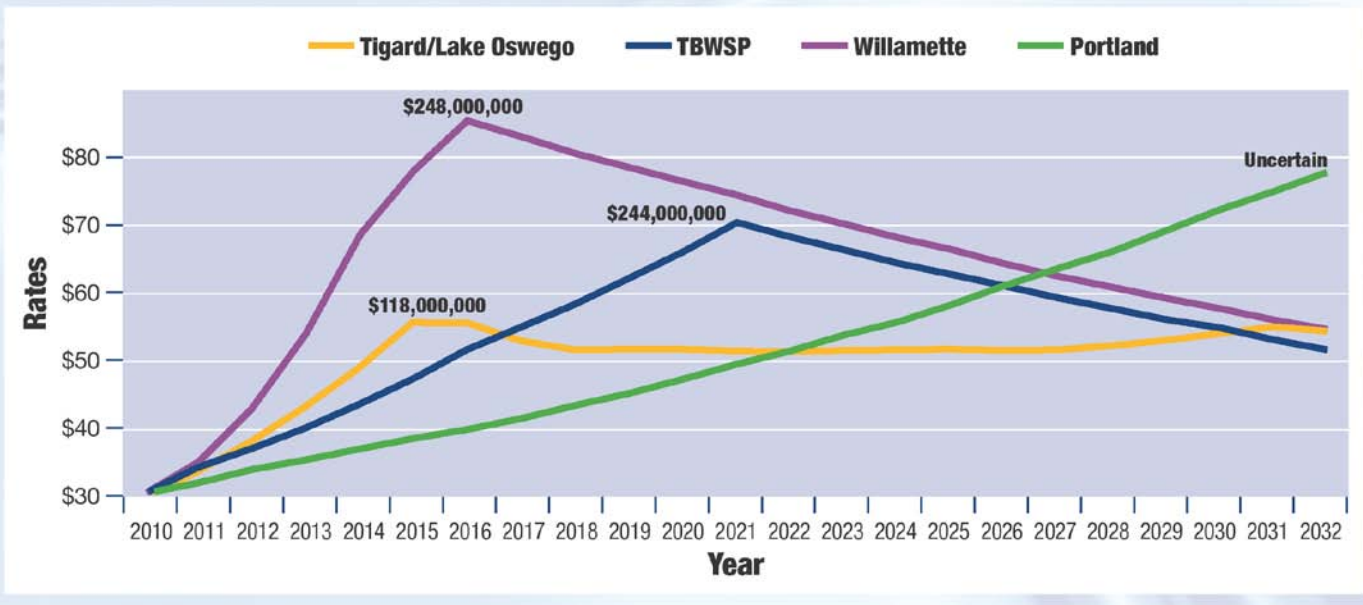
Before the Water Partnership...

- ▶ 2010 Budget was \$7,800,000 with no debt service; cash basis
- ▶ Bi-monthly Water Billing – read meters every two months
- ▶ Average water bill was \$27.55 with average consumption 9 units or 900 cubic feet (6,732 gallons) converted to monthly data
- ▶ Fixed customer charge was \$3.43 per month – **regardless of meter size!**
- ▶ Consumption charges by classification: \$2.68/ccf for residential customers; multi-family less, commercial and irrigation more...

Water Partnership Events

- 5-year Budget Analysis indicates \$9.3 M annual debt service by 2017; Debt service ramps up to this amount in <5 years
- Changes in bond requirements recommend implementing bond coverage at least 18 months in advance to bond sales
- City's first rate shock – Financial analysts recommend 30% rate increases each year for the next 3 years... cumulative increases!
- Ultimately City agrees to 35% rate hike first year; 14% rate hikes for the next 3 years; 4.3% rate hikes last few years!
- The fixed cost of debt service requires City to increase fixed fees proportionate to water meter size to increase base revenues
- ▶ Due to the significant increases, City also implements monthly billing through monthly meter reading – increases fixed costs!

Estimated Water Rates for Tigard Water Supply Options



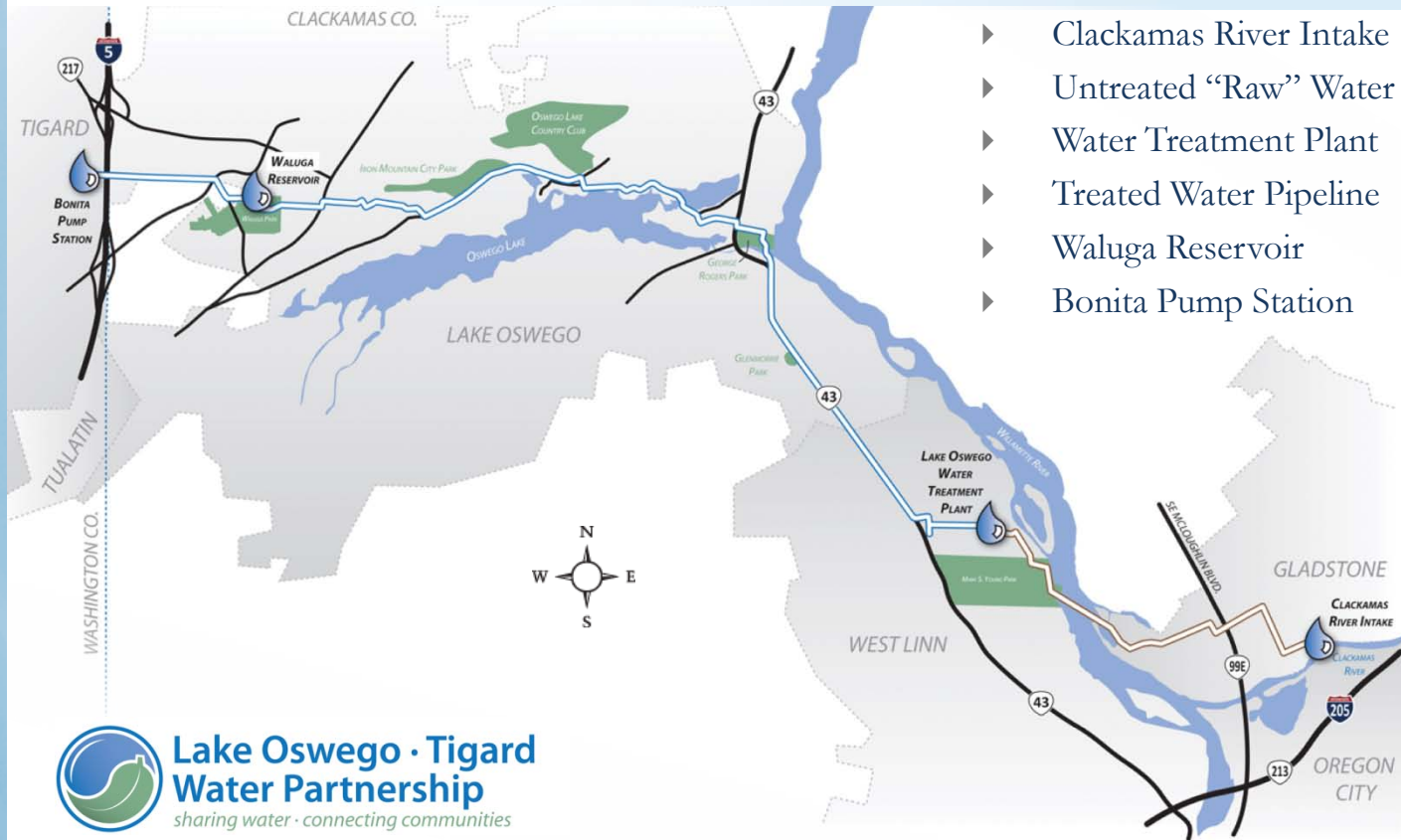
Tigard Selects the Lake Oswego Partnership Option in 2008

- ▶ 14 million gallons a day
- ▶ Ownership share of assets
(allows SDC use)
- ▶ Technical oversight
- ▶ Political oversight
- ▶ Completion by 2016
- ▶ **Tigard's Share of Capital Costs: \$123,000,000**



2010 Project Definition

Work Refines Scope/Cost



Water Rate Design Challenges

Revenue Stability

- Improve revenue stability for the water utility with cost-of-service-based fixed charges

Equity

- Enhance equity among customer classes by using cost-of-service-based rates
- Enhance equity within customer classes by using tiered rates to recover some peak-related costs

Conservation

- Promote conservation with the use of increasing tier pricing

Before Tigard can proceed to move forward to fund the Lake Oswego-Tigard Partnership

- ▶ **Complete a Water Master Plan that identifies the new water source**
- ▶ Complete a Water Rate Study that fully funds total O&M and debt service
- ▶ Complete a Water System Development Charge (SDCs) Update that allocates new water source costs
- ▶ Adopt a Water Supply Facilities Capital Improvement Project List with \$230,000,000 identified in expansion improvements
- ▶ Complete all this from December 2009 to December 2010
- ▶ **City Council elections occur November 2010**

Implementation of Water Financial Plan

Written Communications Plan

Tag Line:

A water financial plan is necessary to set up the revenue required to fund ownership in a safe, dependable supply of drinking water to the residents in Tigard, Durham, King City, and Tigard Water District (Tigard Water Service Area or TWSA).

Key Message:

- Ownership has always been a high priority of the citizens as it provides security.
- Ownership has high initial costs but lower overall long term costs.
- Ownership was implemented in August 2008 with the Lake Oswego/Tigard Joint Water Supply partnership
- Water Financial Plan considers the costs associated with funding large capital improvements to deliver water to Tigard by 2016.
- City of Portland Water Purchase contract expires 2016.

“Water delivered to your home for less than a penny per gallon”

- In the long term the community will be provided with sustainable high quality drinking water at the least cost for ownership through partnering with our neighbor City of Lake Oswego. “Sharing Water – Connecting Communities”

Meeting the Challenges – Debt Financing

Period	Example Monthly Bills*	Annual Rate Revenue Increases	Debt Financing Schedule
Current	\$27.55		
FY2011	37.05	34.5%	\$2,097,054
FY2012	42.24	14.0%	44,147,727
FY2013	48.16	14.0%	0
FY2014	54.90	14.0%	40,000,000
FY2015	57.26	4.3%	0
FY2016	59.72	4.3%	0
FY2017	62.29	4.3%	41,341,374
FY2018	64.97	4.3%	0
FY2019	64.97	0.0%	0
FY2020	64.97	0.0%	0
Total			\$127,586,155

* Residential example monthly bill. Monthly use assumed at 9 CCF.

Meeting the Challenge: Revenue Stability

Increase Fixed Revenue

Meter Size	Oct. 2010	Jan. 2011	Jan. 2012	Jan. 2013	Jan. 2014	Jan. 2015
5/8" x 3/4"	\$3.67	\$15.78	\$17.99	\$20.51	\$23.38	\$24.38
1"	3.67	35.40	40.36	46.01	52.45	54.70
1 1/2"	3.67	93.49	106.58	121.50	138.51	144.47
2"	3.67	151.68	172.92	197.12	224.72	234.38
3"	3.67	298.56	340.36	388.01	442.33	461.35
4"	3.67	567.12	646.52	737.03	840.21	876.34
6"	3.67	635.88	724.90	826.39	942.08	982.59
8"	3.67	993.12	1,132.16	1,290.66	1,471.35	1,534.62
10"	3.67	1,832.55	2,089.11	2,381.58	2,715.00	2,831.75
12"	3.67	2,592.94	2,955.95	3,369.78	3,841.55	4,006.74

Meeting the Challenge: Equity Booster Pump Charges

Meter Size	Oct. 2010	Jan. 2011	Jan. 2012	Jan. 2013	Jan. 2014	Jan. 2015
5/8" x 3/4"	\$3.24	\$4.08	\$4.32	\$4.58	\$4.86	\$5.15
1"	3.24	10.87	11.52	12.21	12.95	13.72
1 1/2"	3.24	32.60	34.56	36.63	38.83	41.16
2"	3.24	52.93	56.11	59.47	63.04	66.82
3"	3.24	93.33	98.93	104.87	111.16	117.83
4"	3.24	191.41	202.89	215.07	227.97	241.65
6"	3.24	203.75	215.98	228.93	242.67	257.23
8"	3.24	326.00	345.56	366.29	388.27	411.57
10"	3.24	636.93	675.15	715.65	758.59	804.11
12"	3.24	917.17	972.20	1,030.53	1,092.36	1,157.91

Meeting the Challenges: Equity & Conservation

Recommended Tier Thresholds

Meter Size	Recommended Thresholds (CCF)		
	Tier 1	Tier 2	Tier 3
5/8" x 3/4"	6	15	Over 15
1"	16	40	Over 40
1 1/2"	48	120	Over 120
2"	78	195	Over 195
3"	137	344	Over 344
4"	282	705	Over 705
6"	300	750	Over 750
8"	480	1,200	Over 1,200
10"	938	2,345	Over 2,345
12"	1,350	3,376	Over 3,376

Meeting the Challenge: Equity & Conservation

Tiered Water Rates 2011-2013 (\$/CCF)

Year / Class	Tier 1 Rate	Tier 2 Rate	Tier 3 Rate
January 2011			
Residential	\$2.04	\$2.98	\$3.41
Multi-Family	1.70	2.48	2.84
Commercial	2.32	3.38	3.87
Industrial	3.23	3.23	3.23
Irrigation	4.59	4.59	4.59
January 2012			
Residential	\$2.33	\$3.40	\$3.89
Multi-Family	1.94	2.83	3.24
Commercial	2.64	3.85	4.41
Industrial	3.68	3.68	3.68
Irrigation	5.23	5.23	5.23
January 2013			
Residential	\$2.65	\$3.87	\$4.43
Multi-Family	2.21	3.22	3.69
Commercial	3.02	4.39	5.03
Industrial	4.20	4.20	4.20
Irrigation	5.97	5.97	5.97

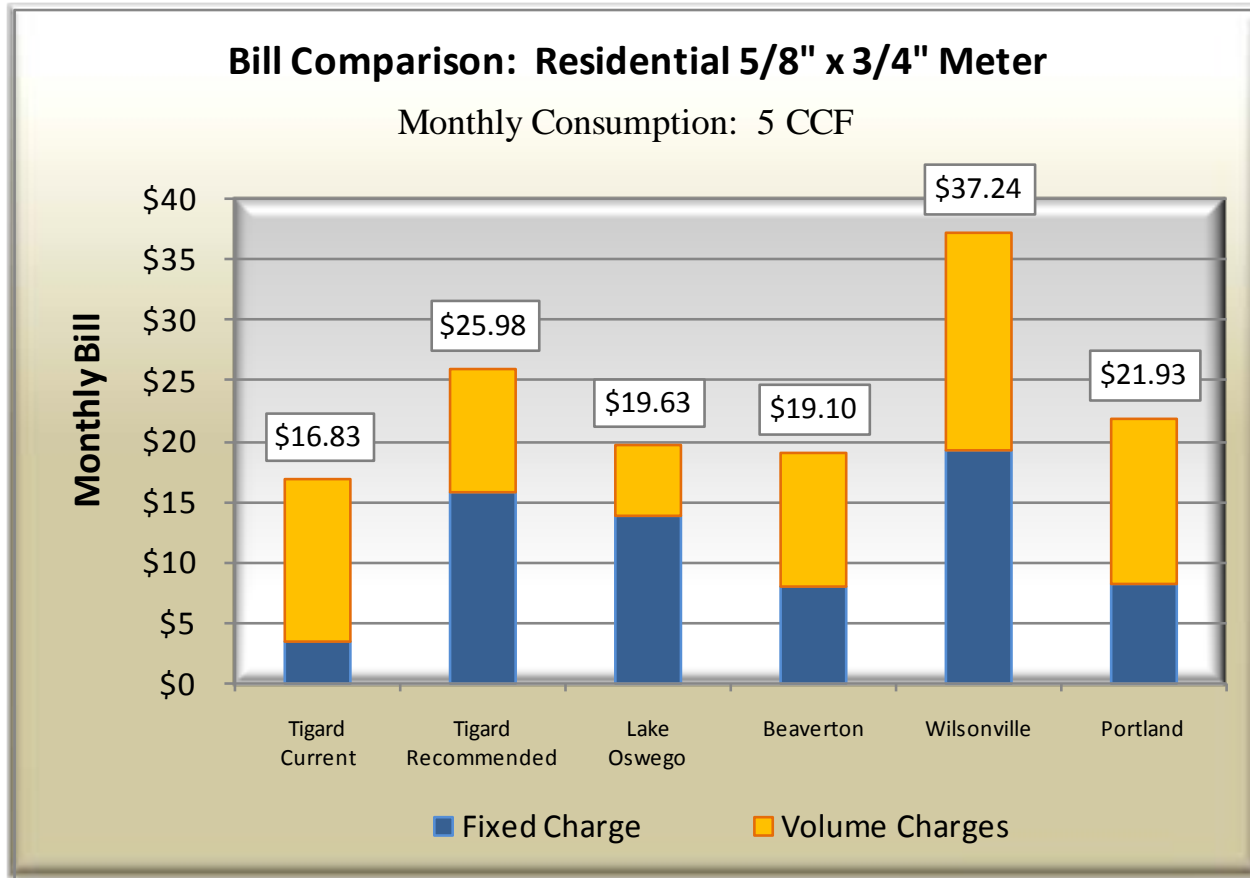
Meeting the Challenge: Equity & Conservation

Tiered Water Rates 2014-2015 (\$/CCF)

January 2014			
Residential	\$3.02	\$4.42	\$5.05
Multi-Family	2.52	3.67	4.21
Commercial	3.44	5.01	5.73
Industrial	4.79	4.79	4.79
Irrigation	6.80	6.80	6.80
January 2015			
Residential	\$3.15	\$4.60	\$5.27
Multi-Family	2.63	3.83	4.39
Commercial	3.58	5.22	5.98
Industrial	4.99	4.99	4.99
Irrigation	7.09	7.09	7.09

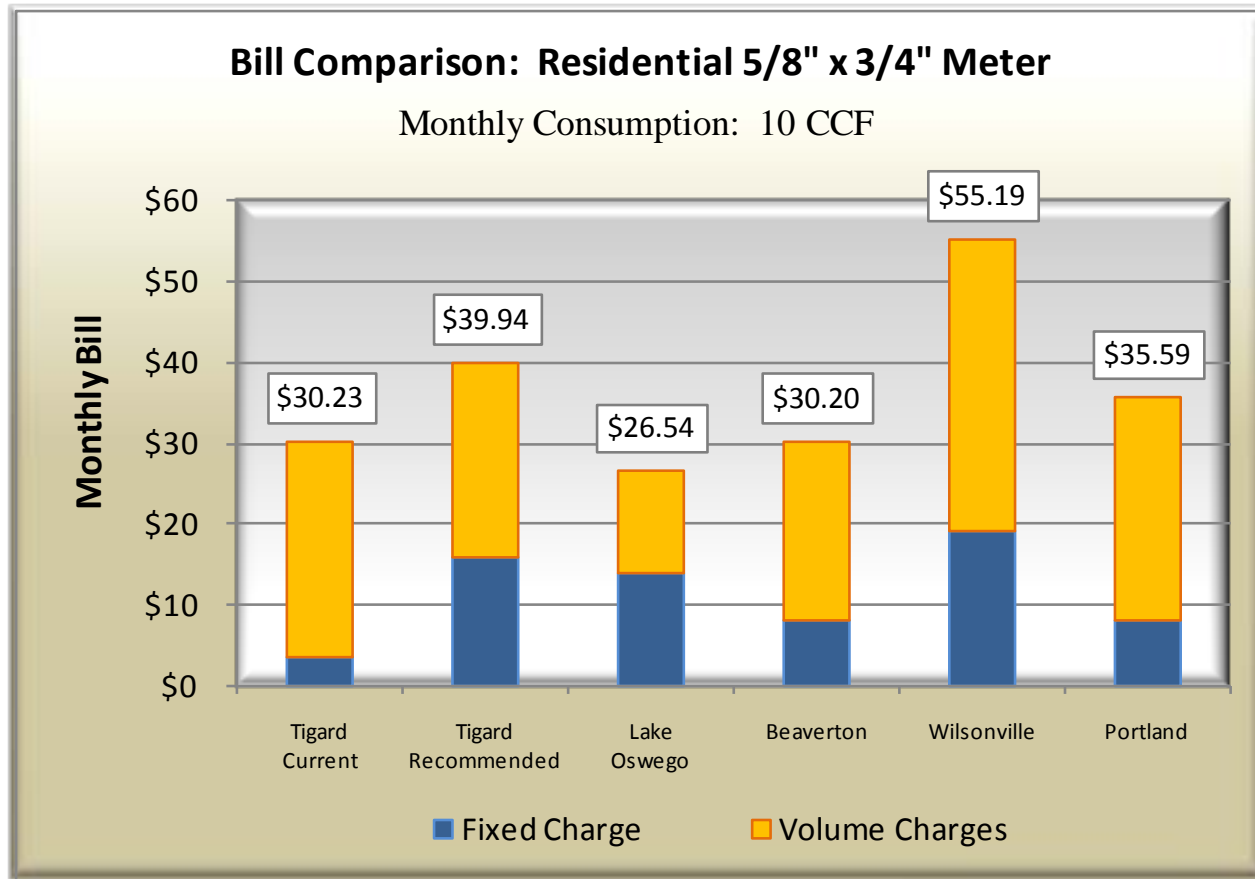
Typical Household Customer

Monthly Water Bill: Comparison



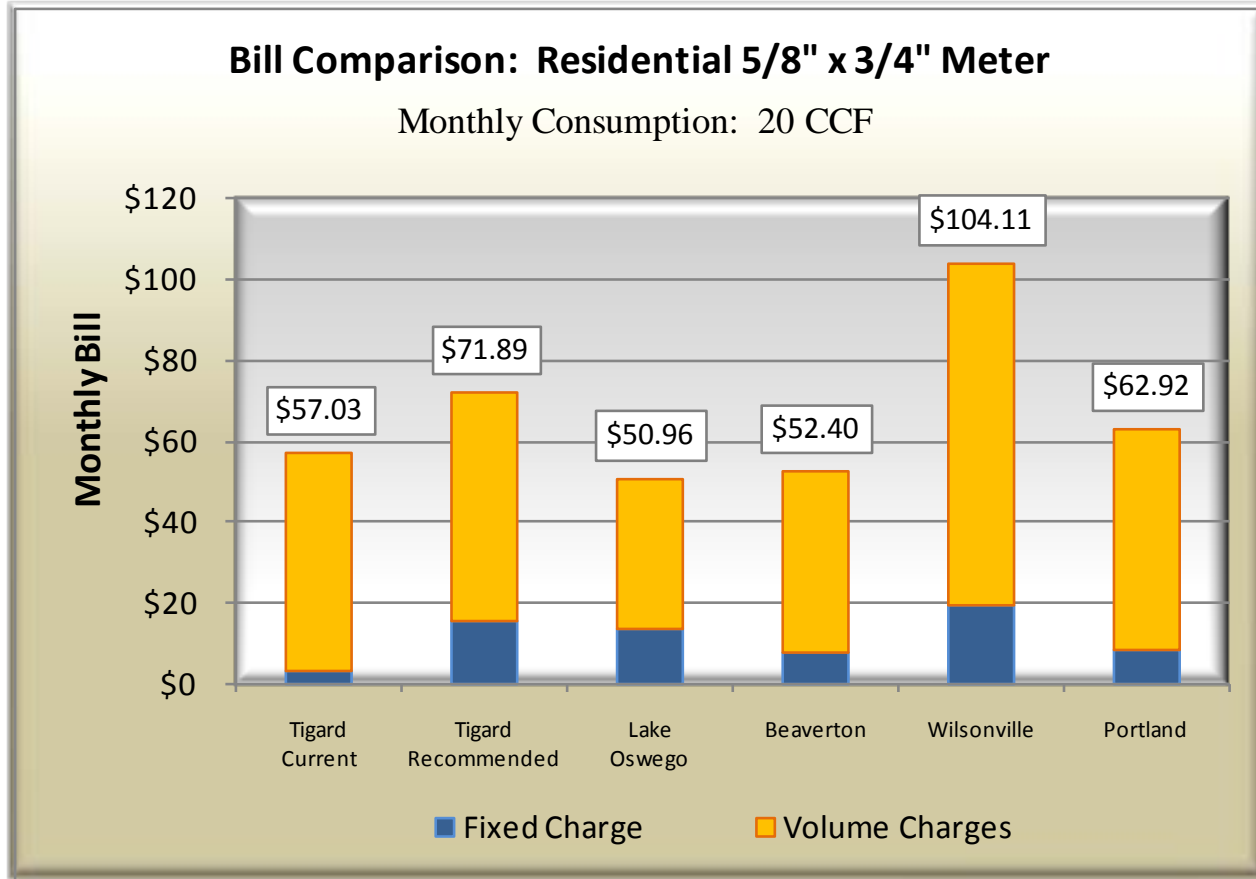
Medium Consumption Customer

Monthly Water Bill: Comparison



High Consumption Customer

Monthly Water Bill: Comparison



Lake Oswego Projected Water Rates

Lake Oswego Average Residential Monthly Bill (10 ccf) Under Partnership with Tigard



ANNUAL INCREASE WITH OZONE	-	25.50%	25.50%	11.65%	11.65%	11.65%	4.00%	4.00%
ANNUAL INCREASE NO OZONE	-	22.00%	22.00%	10.50%	10.50%	10.50%	4.00%	4.00%

Key Messages to the Public

- ▶ Tigard is implementing water partnership with Lake Oswego
- ▶ Tigard's partnership obligation is over \$100 million
- ▶ Tigard will spread costs over 25 years using Revenue Bonds
- ▶ Water Rate Fees and Charges need to increase
- ▶ Water Rate Study recommendations provides Revenue Stability, Customer Equity, and supports Conservation

Key Recommendations

- ▶ Adopt Resolution approving the water rate study
- ▶ Adopt Resolution amending current Fees and Charges Schedule with 5 year rate plan
- ▶ Adopt SDC methodology and Amendment to Fees and Charges on December 14, 2010
- ▶ Support monthly billing and “Care to Share”

Recommendations

- Include enough detail –
HOW WAS THE BILL COMPUTED!
- Consider more frequent billing intervals –
SMOOTH OUT IMPACTS!
- Consider special rates and fee options –
ASSISTANCE!
- Make sure rates are equitable, defensible, and affordable –
EACH CUSTOMER HAS A DIFFERENT SENSE OF WHAT'S AFFORDABLE!

Tigard's Experience Implementing Water Rate Increases

QUESTIONS?



Funding Strategy for the Lake Oswego/Tigard Water partnership

Attracting the Next Generation of Leaders

Nicki Pozos, Ph.D., P.E.

May 3, 2012

PNWS AWWA Conference



Many of today's leaders are already eligible to retire

Who are today's leaders?

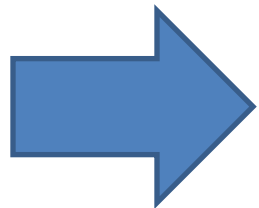
Male	94%
White/non-hispanic	94/98%
Over 50 years old	72%
College educated	46%
Engineering degree	29%

Manny Teodoro et al. (2012) *Water Utility Executive Leadership for the 21st Century*, Water Research Foundation.

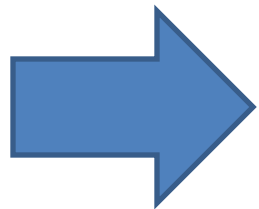


Who will tomorrow's leaders be?

Members of GenX are the most likely candidates (32 to 47 years old)



Are there enough to go around?



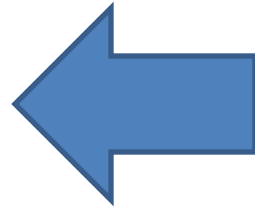
Do they want the job?

How can we attract more GenXers to leadership positions?

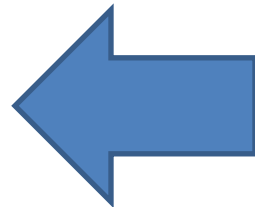
It is useful to keep in mind GenX cost-benefit math

Benefit

Cost

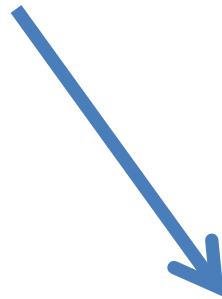


- Cynicism
- Sense of being interchangeable



- Loss of work/life balance
- Stress
- Loss of **control**

It's not that GenXers don't **want** to make a difference, it's just that they doubt they do

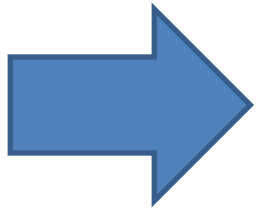


~~Greater
good in
the world~~

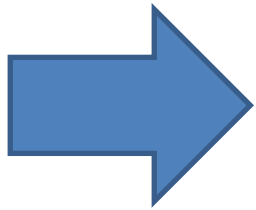
Personal
advantages/
disadvantages

So how can we get GenXers to believe they can impact our industry for the better?

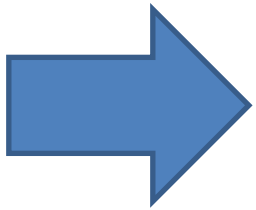
So how can we get GenXers to believe they can impact our industry for the better?



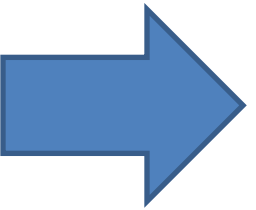
Have the opportunity to improve organizations in a way that is meaningful to them



Engagement in AWWA and other professional organizations



Opportunities to mentor other workers



Your idea?

Contact Info:

Nicki Pozos

nicki.pozos@hdrinc.com

503-423-3817



Utility Manager's Forum

Asset Management

Lessons learned from boot strap to full service methods of asset management implementation.

City of Hillsboro
Joint Water Commission

Team Introduction

- Peter Martins, Management/Process Champion
- Frank Bond, Information Services (*tech representative*)
- Dave Westby, GIS (*and in-house subject matter expert*)
- Victor Fujinami, Valve & Hydrant Lead (*the end user*)
- Chris Wilson, JWC WTP Lead Operator (*PM, the end user*)

Overview

- 20 minute Presentation
 - Executive Management Perspective
 - Hillsboro (Boot Strap Method; City roll-out)
 - JWC (Full Service Method)
- 35-40 minute Q&A

Executive Management

- Why we wanted it.
- What we needed it to do.
- What was our role.

Why we wanted it?

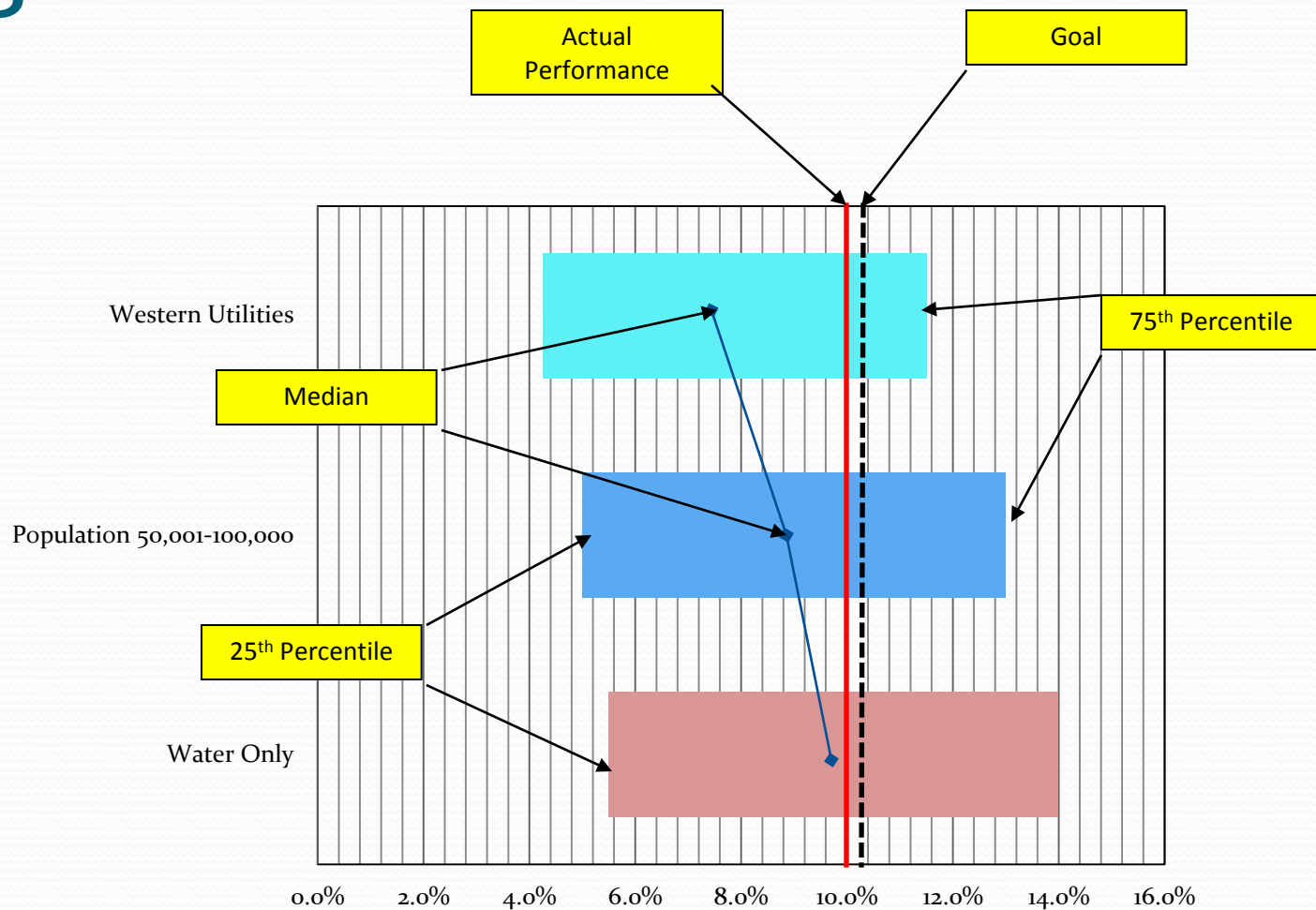
- Demands/Revenues tracking down
- Rate increases meeting resistance
- Assets getting older and requiring more resources.
- Budget review: aggressive
 - Why?
 - Can't you do with less?

What we needed it to do.

- Big picture:
 - Efficiency/Working Smarter
 - Compare to peers (AWWA Benchmarking)
 - Goal communication
 - Result communication

**System reaction to
budget decisions**

Big Picture



What we needed it to do.

- Big picture:
 - Compare to peers (AWWA Benchmarking)
 - Goal communication
 - Result communication
- Boots on the ground direction
 - Data for big picture
 - Efficient/smarter operations (*open*)
 - Not be cumbersome (field hassle/compliance)

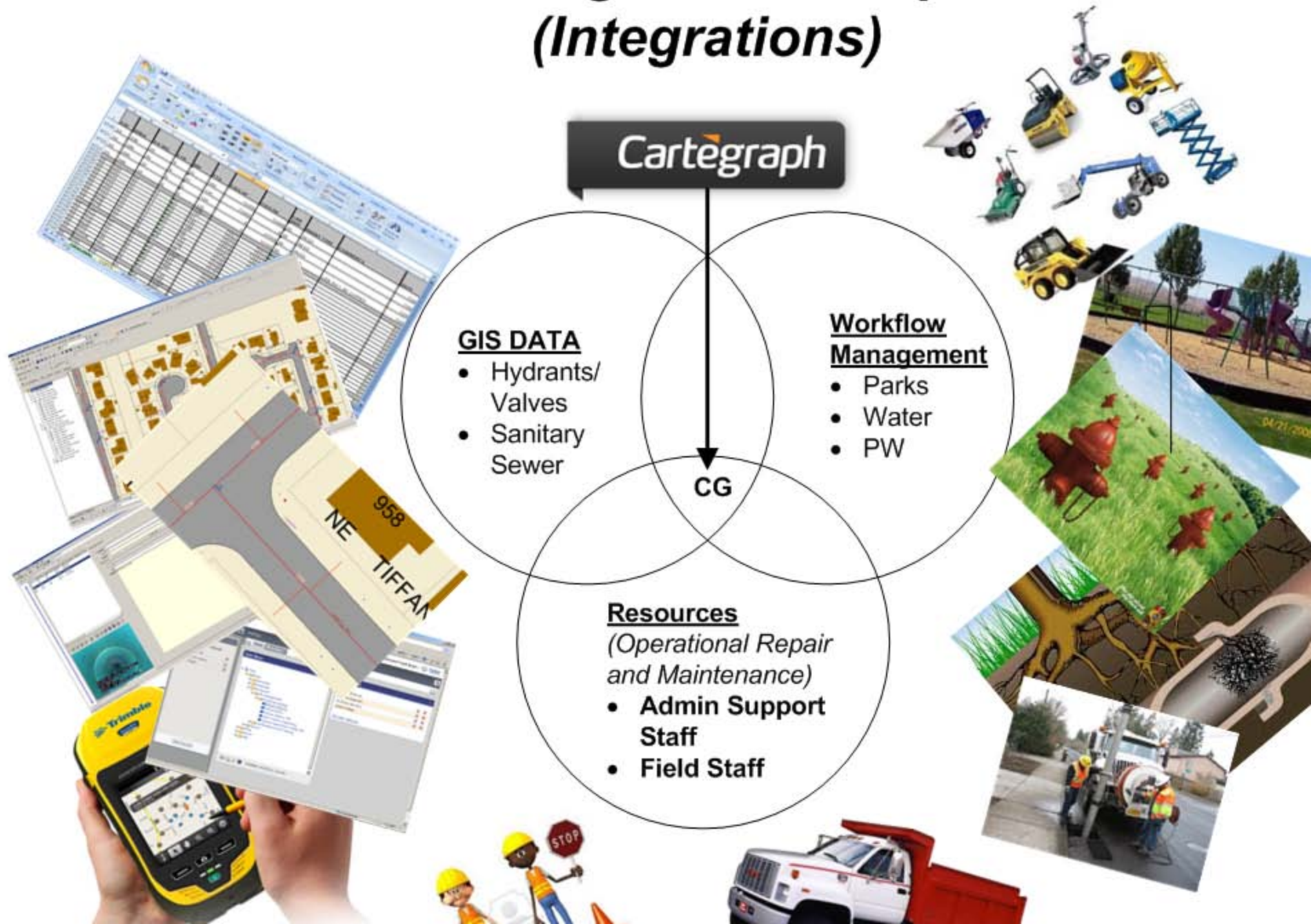
Our role

- Team assembly
- Clear vision & direction
- Resource support/Clear bottlenecks (prioritization)
- Team/staff assurance

Hillsboro – Boot Strap

- Information Services
- In-house (SME) System Matter Expert
- End User

Asset Management Components (Integrations)

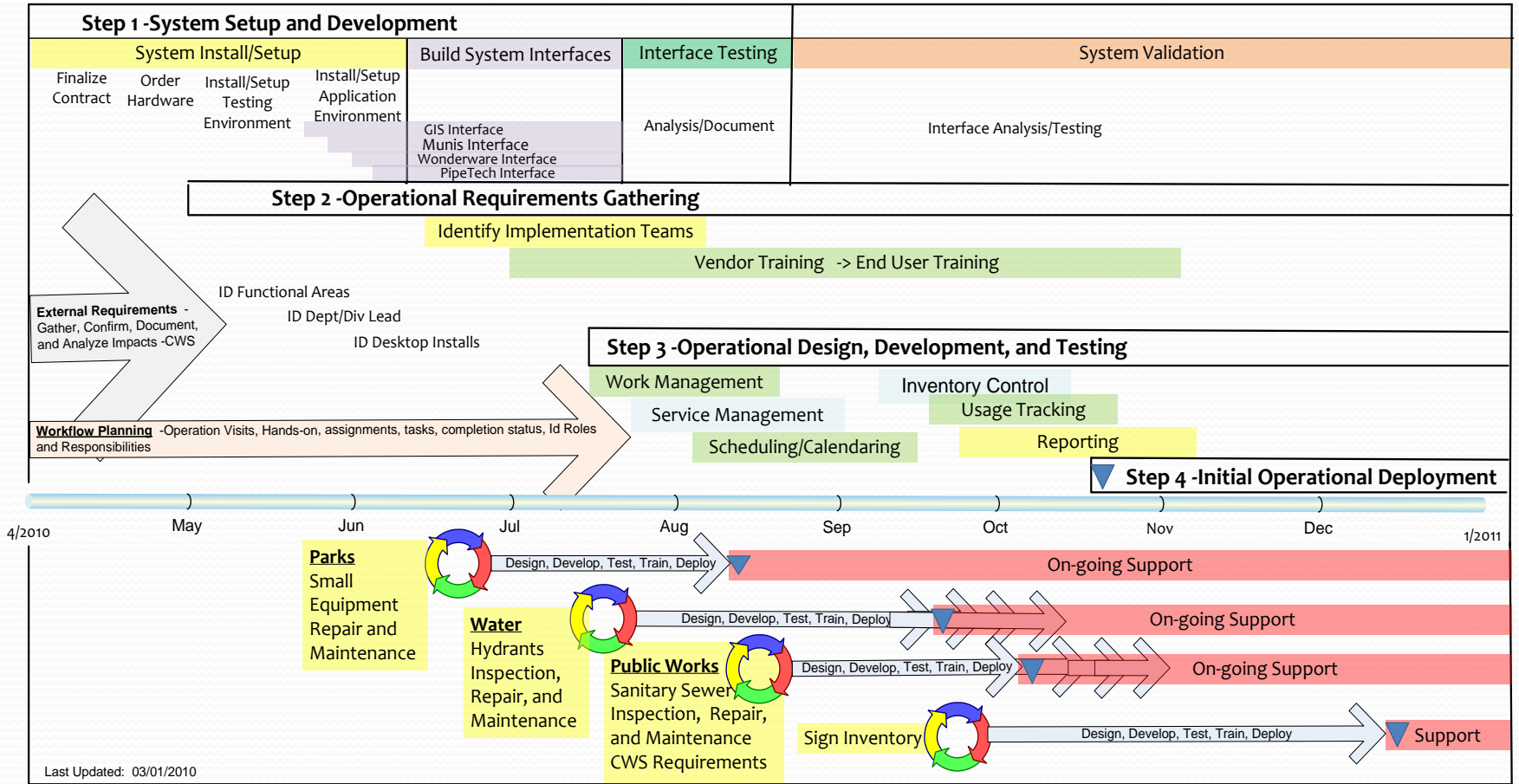


Total Enterprise Asset Management Project Implementation Timeline

City of Hillsboro

Information Services

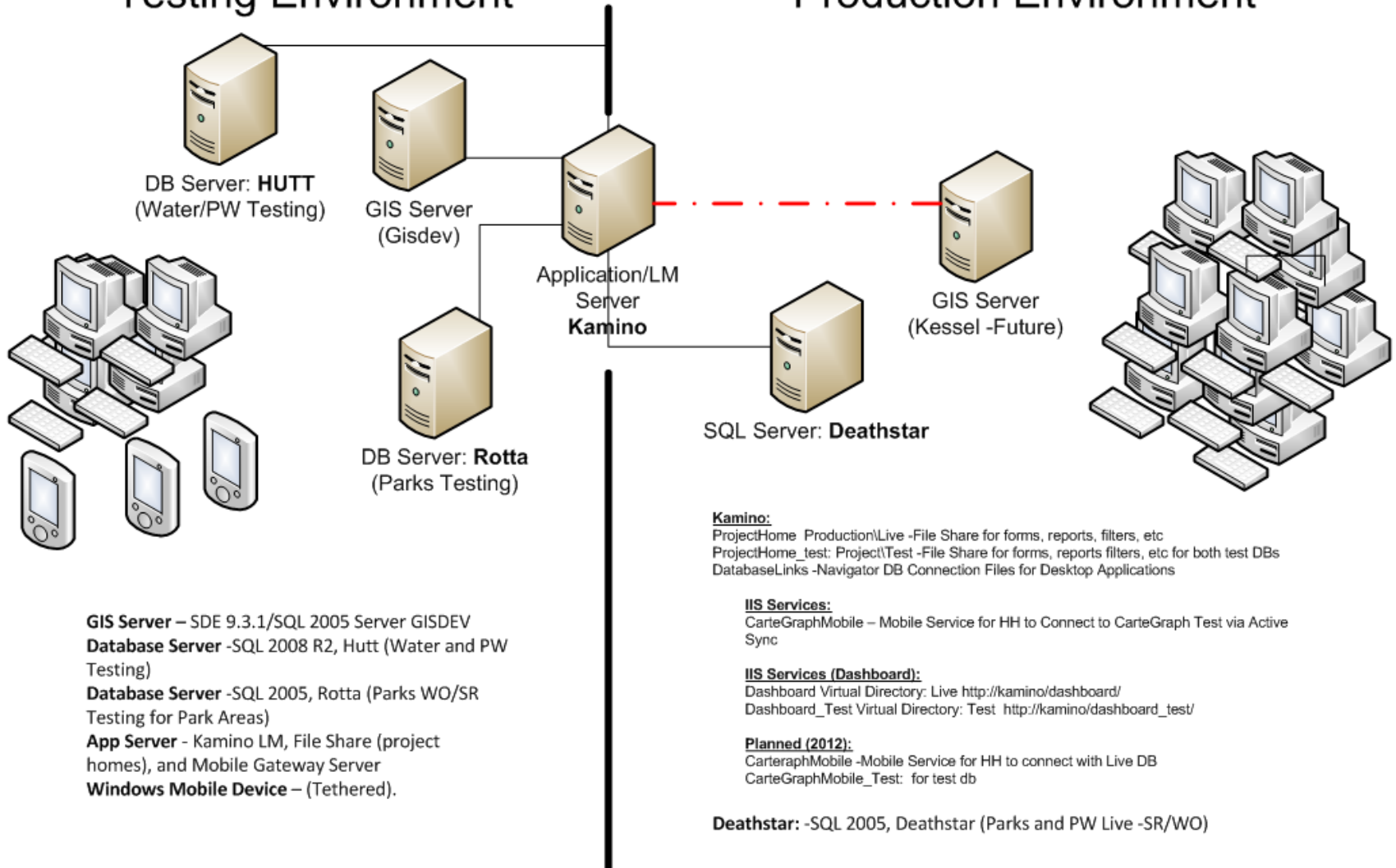
Draft - 04/01/2010



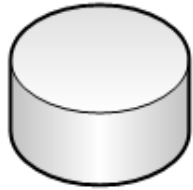
System Architectural and Functional Design

Live Testing Environment

Live Production Environment



CarteGraph System Integration(s)



**Financial Management System
(Production Database)**

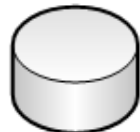
CarteGraph/Finance System

Labor Rates: System sends emails when employee rates change. Manual update into CarteGraph

Vehicles: One time import.

Utility Billing:

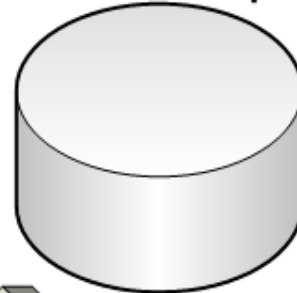
1. CarteGraph button click to pull pending Service Requests.
2. Nightly updates from CarteGraph to UB for completed Work Orders.
3. Nightly Inserts into UB for Water Ops initiated Work Orders.



AsBuilt Search

CarteGraph/AsBuilt Search
Button click in CarteGraph to query AsBuilt DB. Pulls list and opens PDF.

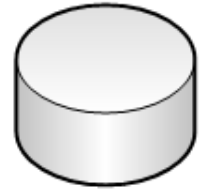
CarteGraph



CarteGraph/Other Various Data Sources Imported:

MS Access: Hydrant Inspections, Addresses

Excel: Line Cleanings, Equipment Rates, Equipment Assignments



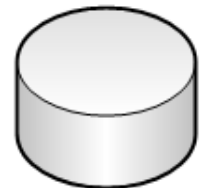
GIS

CarteGraph/GIS

Both systems can read each others data real-time.

CarteGraph/PipeTech -Sewer Video

One button click in CarteGraph pulls all pending video inspections and observations. Both systems read the same vide file.



PipeTech



SME

Communication & Flexibility:

- *Op's crew already had excellent data collected* but it was in various databases or on paper.
- *GIS was in use city wide* by almost every dept. but was missing data.
- *End users wanted information* but couldn't get to it.

Table

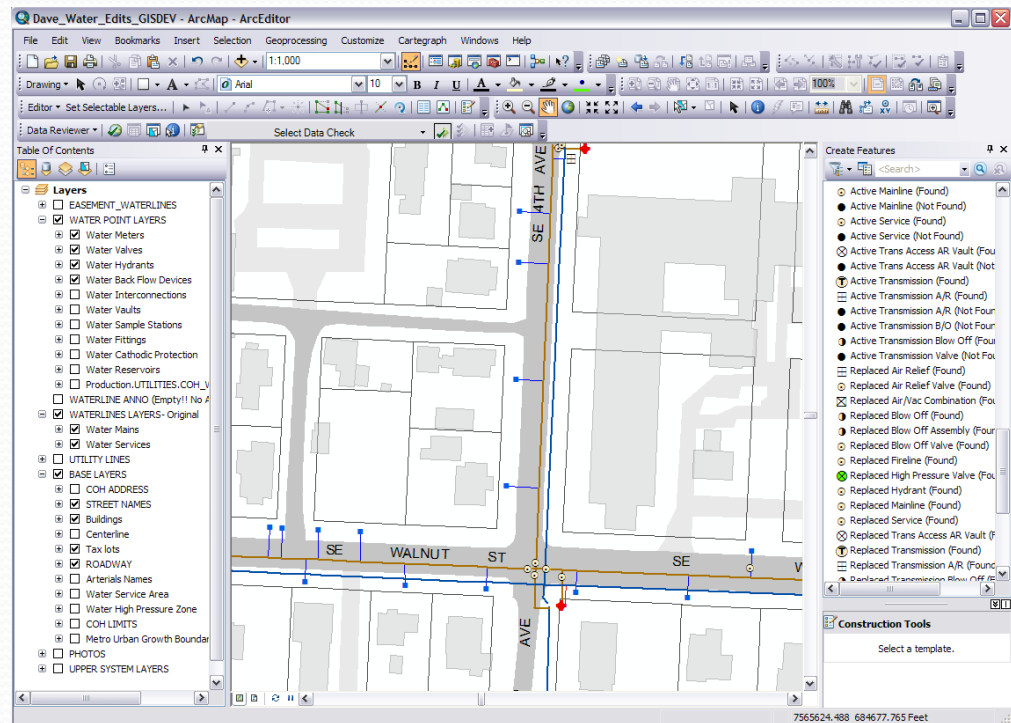
Water Meters

OBJECTID*	Meter Type*	Life Cycle Status	Owner	Meter ID*	Meter Size	Customer Class	Cycle	AMR Flag	GIS Data Source	GIS Editor	GIS E
19320	Irrigation	Active	<Null>	Empty		1 Irrigation	3	<Null>	AsBuilts	Dave Westby	7/24/2007
23069	Irrigation	Active	<Null>	Empty	0.75	Irrigation	3	N/A	AsBuilts	Dave Westby	5/1/2008
18692	Irrigation	Active	<Null>	52206639		1 Irrigation	22	Yes	AsBuilts	Dave Westby	11/25/2007
21830	Domestic	Active	<Null>	51328035		1 ResidentialSingleFamily	9	Yes	GPS	Dave Westby	8/17/2007
1173	Domestic	Active	<Null>	85749479	0.75	Commercial	9	Yes	ESU	Jay Leroux	<Null>
14523	Domestic	Active	<Null>	85975894	0.75	ResidentialSingleFamily	17	Yes	GPS	Jay Leroux	<Null>
1046	Domestic	Active	<Null>	60594543	1.5	ResidentialMultiFamily	1	Yes	City Installed	Dave Westby	8/1/2008
14059	Domestic	Active	<Null>	89981576	0.75	ResidentialSingleFamily	18	Yes	GPS	Jay Leroux	4/2/2007
24024	Domestic	Active	<Null>	70211085		4 Public	9	Yes	AsBuilts	Dave Westby	6/16/2011
940	Domestic	Active	<Null>	516886595		1 Commercial	1	Yes	City Installed	Dave Westby	10/18/2007
23453	Irrigation	Active	<Null>	60460141	1.5	Irrigation	3	Yes	Field Check	Dave Westby	7/20/2007
22317	Irrigation	Active	<Null>	90394605	0.625	Irrigation	<Null>	Yes	Field Check	Dave Westby	8/31/2007
24167	Domestic	Active	<Null>	89028676	0.625	Industry	1	Yes	City Installed	Dave Westby	9/9/2011
1963	Irrigation	Active	<Null>	38703397	0.75	Irrigation	19	No	ESU	Jay Leroux	5/3/2007
22327	Domestic	Active	<Null>	89459026	0.75	Industry	9	Yes	GPS	Dave Westby	9/4/2007
10741	Domestic	Active	<Null>	87679105	0.75	None	2	<Null>	ESU	Jay Leroux	7/12/2007
24742	Domestic	Under Construction	Beaverto	123456789	0.625	ResidentialSingleFamily	91	No	Field Check	Dave Westby	3/27/2012
24743	Domestic	Active	COH	654321	1.5	Irrigation	99	Yes	AsBuilts	Dave Westby	3/27/2012
25142	Domestic	Active	COH	0987654321	10	ResidentialSingleFamily	23	No	AsBuilts	Dave Westby	3/30/2012
25143	Irrigation	Active	COH	Empty	0.625	Irrigation	<Null>	No	AsBuilts	Dave Westby	3/30/2012
23234	Domestic	Active	<Null>	51933602		1 ResidentialSingleFamily	10	Yes	City Installed	Dave Westby	4/12/2011
23241	Domestic	Active	<Null>	87450284	0.75	ResidentialSingleFamily	3	Yes	City Installed	Dave Westby	4/20/2011
22810	Domestic	Active	COH	90987455	0.625	ResidentialSingleFamily	1	Yes	City Installed	Dave Westby	12/9/2008
23355	Domestic	Active	COH	86952086	0.625	ResidentialSingleFamily	2	Yes	GPS	Jay Leroux	7/9/2007
24082	Domestic	Active	<Null>	90394586	0.625	ResidentialSingleFamily	9	Yes	GPS	Jay Leroux	<Null>
11215	Domestic	Active	<Null>	89028429	0.75	ResidentialSingleFamily	12	Yes	ESU	Jay Leroux	<Null>
11221	Domestic	Active	<Null>	87449997	0.625	ResidentialSingleFamily	12	Yes	ESU	Jay Leroux	<Null>
11329	Domestic	Active	<Null>	87449995	0.625	ResidentialSingleFamily	12	Yes	ESU	Jay Leroux	<Null>
11231	Domestic	Active	<Null>	89250979	0.625	ResidentialSingleFamily	12	Yes	ESU	Jay Leroux	<Null>
11547	Domestic	Active	<Null>	87449990	0.625	ResidentialSingleFamily	12	Yes	ESU	Jay Leroux	<Null>
13919	Domestic	Active	<Null>	89028736	0.625	NonProfit	22	Yes	GPS	Jay Leroux	5/15/2007
15803	Domestic	Active	<Null>	90987501	0.625	ResidentialSingleFamily	23	Yes	GPS	Jay Leroux	<Null>
22311	Domestic	Active	COH	90987575	0.625	ResidentialSingleFamily	3	Yes	AsBuilts	Dave Westby	8/31/2007
22599	Domestic	Active	COH	90987452	0.625	ResidentialSingleFamily	8	Yes	AsBuilts	Dave Westby	7/11/2008
22774	Domestic	Active	<Null>	90394443	0.625	ResidentialSingleFamily	12	Yes	AsBuilts	Dave Westby	5/29/2007
22822	Domestic	Active	<Null>	85749577	0.625	ResidentialSingleFamily	9	Yes	AsBuilts	Dave Westby	8/28/2007
22097	Domestic	Active	<Null>	85749454	0.625	ResidentialSingleFamily	9	Yes	GPS	Dave Westby	8/24/2007
22127	Domestic	Active	<Null>	85749535	0.625	ResidentialSingleFamily	9	Yes	GPS	Dave Westby	8/28/2007
22133	Domestic	Active	<Null>	85745114	0.625	ResidentialSingleFamily	9	Yes	GPS	Dave Westby	8/28/2007
21922	Domestic	Active	<Null>	87449992	0.75	ResidentialSingleFamily	9	Yes	GPS	Dave Westby	8/20/2007
20659	Domestic	Active	<Null>	85464176	0.625	ResidentialSingleFamily	16	Yes	AsBuilts	Dave Westby	10/20/2007
20558	Domestic	Active	<Null>	81947365	0.625	ResidentialSingleFamily	16	Yes	AsBuilts	Dave Westby	10/20/2007
20654	Domestic	Active	<Null>	90987418	0.625	ResidentialSingleFamily	18	Yes	AsBuilts	Dave Westby	10/20/2007

Water Meters

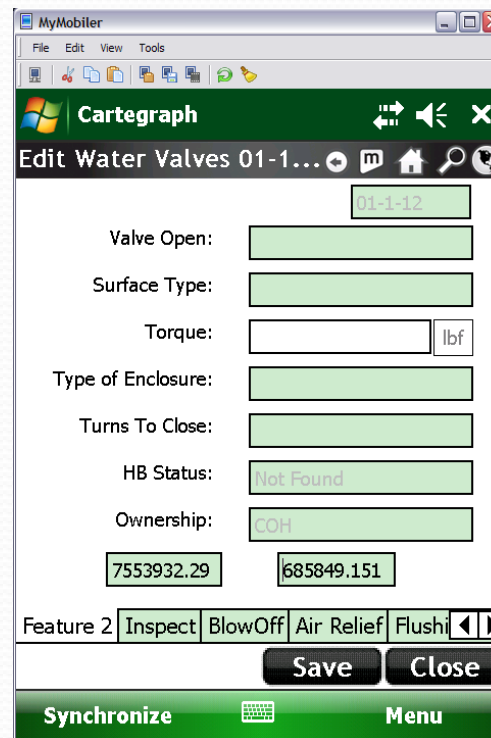
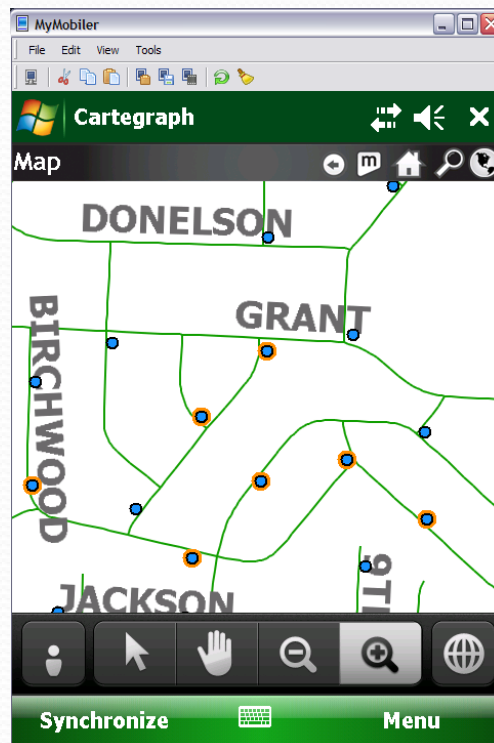
Data Clean up & Unique ID's for both CarteGraph & GIS

- Assets require a *unique ID* that worked in CarteGraph and GIS.
- *Importing as much data as possible* from the existing databases while trying to **match existing data** in GIS (Valve type, Size, number of ports, etc) what gets changed?
- *Checking field types*, renaming, formats, populating data, etc.
- *Modify our GIS editing process* to conform to the CarteGraph integration. Construction drawings vs. As-builts. *Different color schema.*



Desktop and Hand-Helds

- Allowed us to integrate other functions such as *Flow test & Flushing calculations. Enter labor and equipment use one time while in the field.*
- *Viewing Pictures or schematics* of assets while in the field.
- *GPS.*
- *Barcode Scanner*
- *Flexibility!* As we find more or different uses in CarteGraph the program is flexible to meet our needs.





End user

- Paper
- Multiple descriptions
- Unsearchable
- Forms for : Valve Inspections
Blow Off Inspections
Hydrant Inspections
Air Relief Inspections

City of Hillsboro Valve Inspection Report

Map Number :	Type	Address/Location :												
<i>1s2w36a</i>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Mainline :</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Hydrant :</td><td><input type="checkbox"/></td></tr> <tr><td>Service :</td><td><input type="checkbox"/></td></tr> <tr><td>Blowoff :</td><td><input type="checkbox"/></td></tr> <tr><td>Air Relief :</td><td><input type="checkbox"/></td></tr> <tr><td>Transmission :</td><td><input type="checkbox"/></td></tr> </table>	Mainline :	<input checked="" type="checkbox"/>	Hydrant :	<input type="checkbox"/>	Service :	<input type="checkbox"/>	Blowoff :	<input type="checkbox"/>	Air Relief :	<input type="checkbox"/>	Transmission :	<input type="checkbox"/>	<i>123 West Main</i>
Mainline :	<input checked="" type="checkbox"/>													
Hydrant :	<input type="checkbox"/>													
Service :	<input type="checkbox"/>													
Blowoff :	<input type="checkbox"/>													
Air Relief :	<input type="checkbox"/>													
Transmission :	<input type="checkbox"/>													
Intersection # :														
<i>25</i>														

Valve Number :	Depth :	Size :	Manufacture:	Style:
<i>1</i>	<i>4 Ft 0 in</i>	<i>10</i>		
Object ID :	Surface Type:	Open Direction :	# of Turns :	Date Installed:
	<i>Asphalt</i>			
Position :	GPS-- Northing :	GPS -- Easting :	GPS Elevation :	

For The Following Items Use : A = Accepted, N = Not Accepted, W = Work Done

Valve Box To Grade :	<i>A</i>	Valve box Centered :	<i>A</i>
Condition of Valve Box :	<i>A</i>	Condition of Surface :	<i>A</i>
Ease of Operation :	<i>N</i>	Valve Box Clean :	<i>N</i>
Minutes Flushed :		Chlorine Residual :	
Date Inspected :	<i>5-6-11</i>	Inspected By :	<i>OT/RM</i>

Comments :

Valve box needs cleaned

- WORKdirector
- WATERview
- Pipes**
- Water Mains
- Services**
- Water Laterals
- Structures**
- Water Storage Tanks
- Equipment**
- Water Hydrants
- Water Pumps
- Water Valves
- Water Backflows
- Water Meters
- Water Auxiliary Equipment
- GIS**
- SEWERview
- VERSview
- STORMview
- SIGNview

Water Valve Information

ID: 46-30-20

Features

Model:	<input type="text"/>	Valve Open:	No
Manufacturer:	<input type="text"/>	Surface Type:	Concrete
Style:	Gate	HB Torque:	<input type="text"/>
GIS Field Notes:	<input type="text"/>	A/R Enclosure:	<input type="text"/>
GIS Diameter:	2	Turns To Close:	<input type="text"/>
Depth:	<input type="text"/>	GIS Status:	Not Found
GIS ValveType:	Blow Off Assembly	GIS Ownership:	COH

Location

Address Number: 272 Location Description:

Street: NE WACO CT

Cross Street: NE MEADOW

Sent to GIS: Map Valve



Attachments

Attachment viewer area with search, zoom, and navigation icons. The area is currently empty.

Inspections | Blow Off Inspections | Air Relief/Vault Inspection | Flushing | Events | Actions | Reports | Filters

Record: 1 of 1

Inspected By: Dan Thomas

Start DateTime: Stop DateTime:

Inspection Types

	Box To Grade	Condition Of Box	Condition Of Surface	Ease Of Operation	Box
▶	W - Brought to Grade	Accepted	Accepted	Accepted	W - Clean
*					

- New Valve
- Save Valve
- E-mail Valve
- View Valves Report



JWC - Full Service

Cartegraph at the JWC WTP

- **Turn Key system:**

- Cartegraph was to hand us a “ready to use” system.
- Each implementation is unique.
- A “turn key” system does not mean “No work” for us.

- **Data gathering work:**

- Asset install dates, make, model, serial numbers
- O&M manuals
- Previous PM records
- Institutional knowledge

- **Issues and Activities:**

- Challenged us to develop all the inputs/outputs for each type of asset.
- Why do we want “that”?
- Considerable amount of staff time reaching agreement.

- **Asset life expectancy and Asset Condition Assessment**

- CH₂MHill (Curves & OCI)

Cartegraph at the JWTP

What we do:

- Utilize mobile handhelds
- Support “Big Picture” data
- Operators Daily Log
- Asset /Performance Tracking (and replacing)
- Instrument Calibration Tracking
- O&M Manuals at our fingertips
- WonderWare alarms integrated into Cartegraph (*Coming soon*)

Navigation icons: Print, Copy, Paste, Save, Close, Home, Back, Forward, Stop, Refresh, Help, etc.

- Operator
- WORKdirector
- VERSAview
- Chemical Feed
- Chlorinators
- cl2 Injectors
- cl2 Regulators
- Collector
- Electrical
- Facility
- Filter
- Filter Media
- Filter Undrain
- HVAC
- Instrument

Pump Information

ID: Name:



Location

Location Description:

Process: Facility:

Manufacturer: Size:

Model: Weight:

Serial Number: Horsepower:

Type: Head:

Flow: Controller Type:

Number of Stages: RPM:

Attachments

<Project Home>\Attachments\Pum ...

Record: 1 of 1

Service Schedule

Service Schedule:

Base Line Date:

Base Line Usage:

Inspection Events Usage Drawdowns Materials

Record: 1 of 1

Inspection Date: OCI:

Inspected By: OCR:

Inspection Types

Condition Category	Index	Rating	Status	Notes
Appearance	74	Acceptable	Rating entered; Index cal	could use painting
Corrosion	74	Acceptable	Rating entered; Index cal	
Heat	100	Excellent	Rating entered; Index cal	

- New Pump
- Save Pump
- E-mail Pump
- Detailed Inspection
- Performance

Pump ID: M-8 Viewing Record: 20 of 70 Total: 71 Filter Sort

ID	Name	Manufacturer	Model	Serial Number	Facility	Flow	Head	Location Description	Process	Origin	Prediction Group	Replaced	Retire
	Filter Gallery Drainage Pump 1	ABS	SJBI30D		Filter Structure	250 gal/m	25	Sump Pump	Filtration	01/01/1995	Pump	01/01/1995	
	Filter Gallery Drainage Pump 2	ABS	SJBI30D		Filter Structure	250 gal/m	25	Sump Pump	Filtration	01/01/1995	Pump	01/01/1995	
8	Finished Water Pump 1	Verti-Line		V74-02998A	Finished Water Pump Station	4000 gal/m	326.6		Finished Water	01/01/1974	Pump	01/01/1974	
11	Finished Water Pump 2	Peabody Flowway		90-02413	Finished Water Pump Station	7000 gal/m	372		Finished Water	01/01/1974	Pump	01/01/1974	
9	Finished Water Pump 3	Verti-Line		V74-02998D	Finished Water Pump Station	4000 gal/m	326.6		Finished Water	01/01/1974	Pump	01/01/1974	
12	Finished Water Pump 4	Verti-Line	16KH	V74-02998B	Finished Water Pump Station	4000 gal/m	326.6		Finished Water	01/01/1974	Pump	01/01/1974	

Other Lessons Learned

- Will always be a work in progress.
- Look for leverage (can you develop/change one thing and have it populate many?)
- Prepare to challenge yourself on why you do things.
- Prepare for staff engagement. Fan the flame of ownership but don't burn the house down.



Questions???

Potential Questions

- How was AM received by the staff?
- Are we afraid of records or Assets being deleted by accident?
- How user friendly is AM?
- How easy is it to look up an asset or record/work order?
- Do the users think that Cartegraph helps them? In what way?