

# Aging Infrastructure

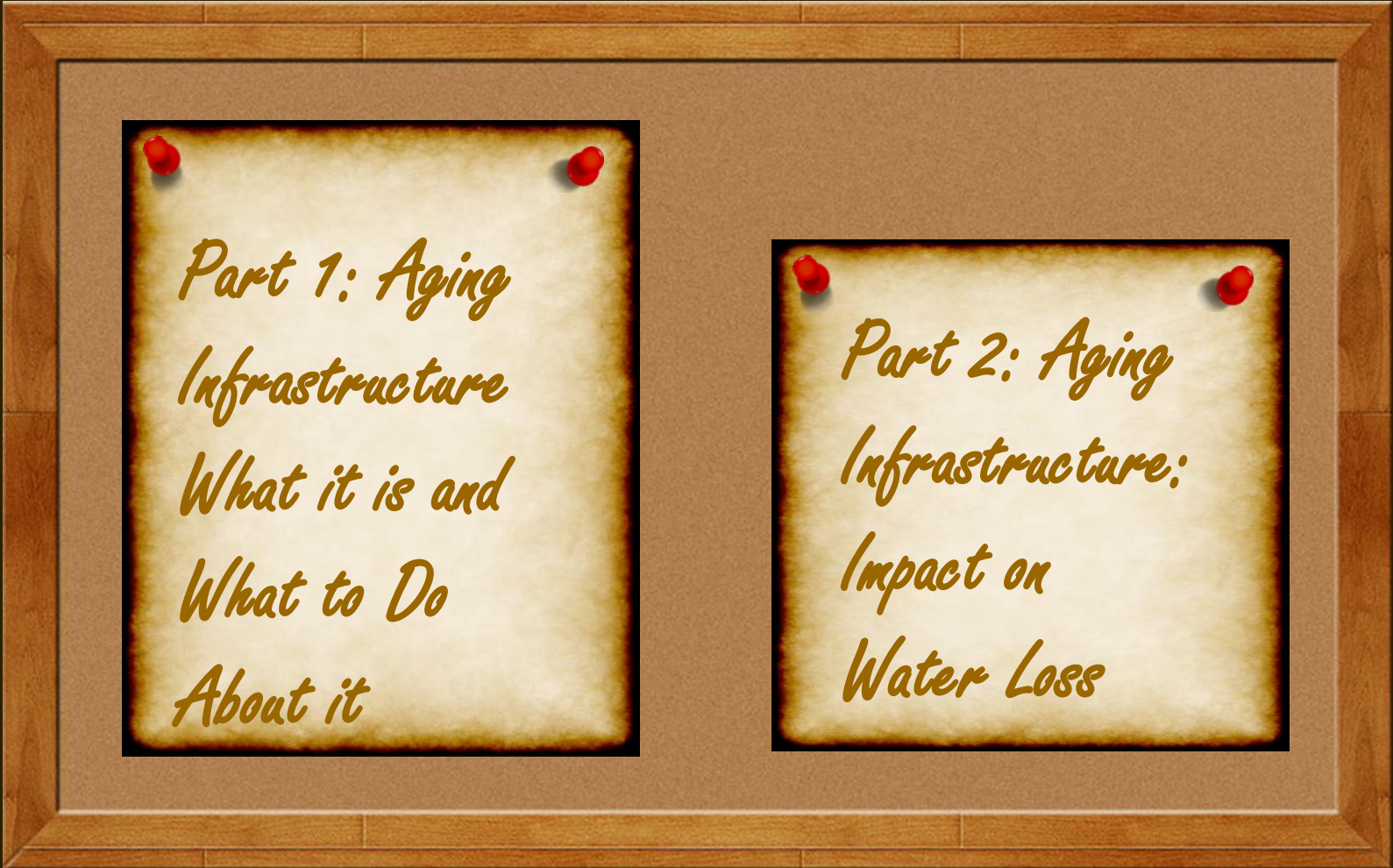
## Webinar 1: What It Is and What To Do About It



*When you know better you do better*

*Maya Angelou*

# WELCOME TO THE EFCN AGING INFRASTRUCTURE WEBINAR SERIES



*Part 1: Aging  
Infrastructure  
What it is and  
What to Do  
About it*

*Part 2: Aging  
Infrastructure:  
Impact on  
Water Loss*





## Small Water Systems Project

Under a cooperative agreement with the [US EPA](#)

Nine Environmental Finance Centers, One project to promote sustainable financing and management for small water systems.

[Learn More](#)



**Smart Management for  
Small Water Systems**

# Asset Management

Current State  
of the Assets

Level of  
Service

Criticality

Life Cycle  
Costing

Long Term  
Funding

# Asset Management

Current state  
of the assets

Level of  
Service

Criticality

Life Cycle  
Costing

Long Term  
Funding



# Asset Management

Current state  
of the assets

Level of  
Service

Criticality

Life Cycle  
Costing

Long Term  
Funding



# Asset Management

Current state  
of the assets

Level of  
Service

Criticality

Life Cycle  
Costing

Long Term  
Funding

City of Petaluma Water and Wastewater Bill

Account Number: 95555-05  
BILL DATE: 2/26/2009  
DATE DUE: 3/26/2009

Customer Name: John W. Doe  
Service Address: 123 Main St.

**Billing Detail:**  
Summary of Charges from 12/29/2008 - 2/26/2009

Water Charges	Wastewater (Sewer) Charges	Other Charges
Tier 1 - (0-10) \$2.75/hf 17 \$46.75	Basic Connection \$6.25/hf 17.00 \$106.25	Fire Sprinkler Charge \$25.00
Tier 2 - (10-20) \$3.15/hf 0 \$0.00	Basic Sewer Charge \$25.00	Hydrex Charge \$25.00
Tier 3 - (20-40) \$3.75/hf 0 \$0.00	Winter Sewer Charge \$25.00	Total Other Charges \$75.00
Tier 4 - (40+) \$4.15/hf 0 \$0.00		
Basic Service Charge \$25.00		
<b>Total Water Charges \$71.75</b>	<b>Total Wastewater Charges \$156.25</b>	<b>Total Other Charges \$75.00</b>
		<b>Total Charges \$303.00</b>

Winter Sewer Average 20.00  
Units: 1000 Gallons (1000 Gallons = 1000 Gallons)

**Summary of Charges:**  
Previous Balance \$133.19  
Payment - Thank You \$133.19  
Water, Wastewater, and Other Charges \$169.81  
Adjustments Deposits \$0.00  
**Total Amount Due \$303.00**

**Water Reading:**  
Current Meter Reading 863  
Prior Meter Reading 843  
Water Usage This Period (hcf) 17  
Water Usage This Period Last Year (hcf) 25  
Meter Number 12345678

**Consumption:**  
Bar chart showing water usage over time.

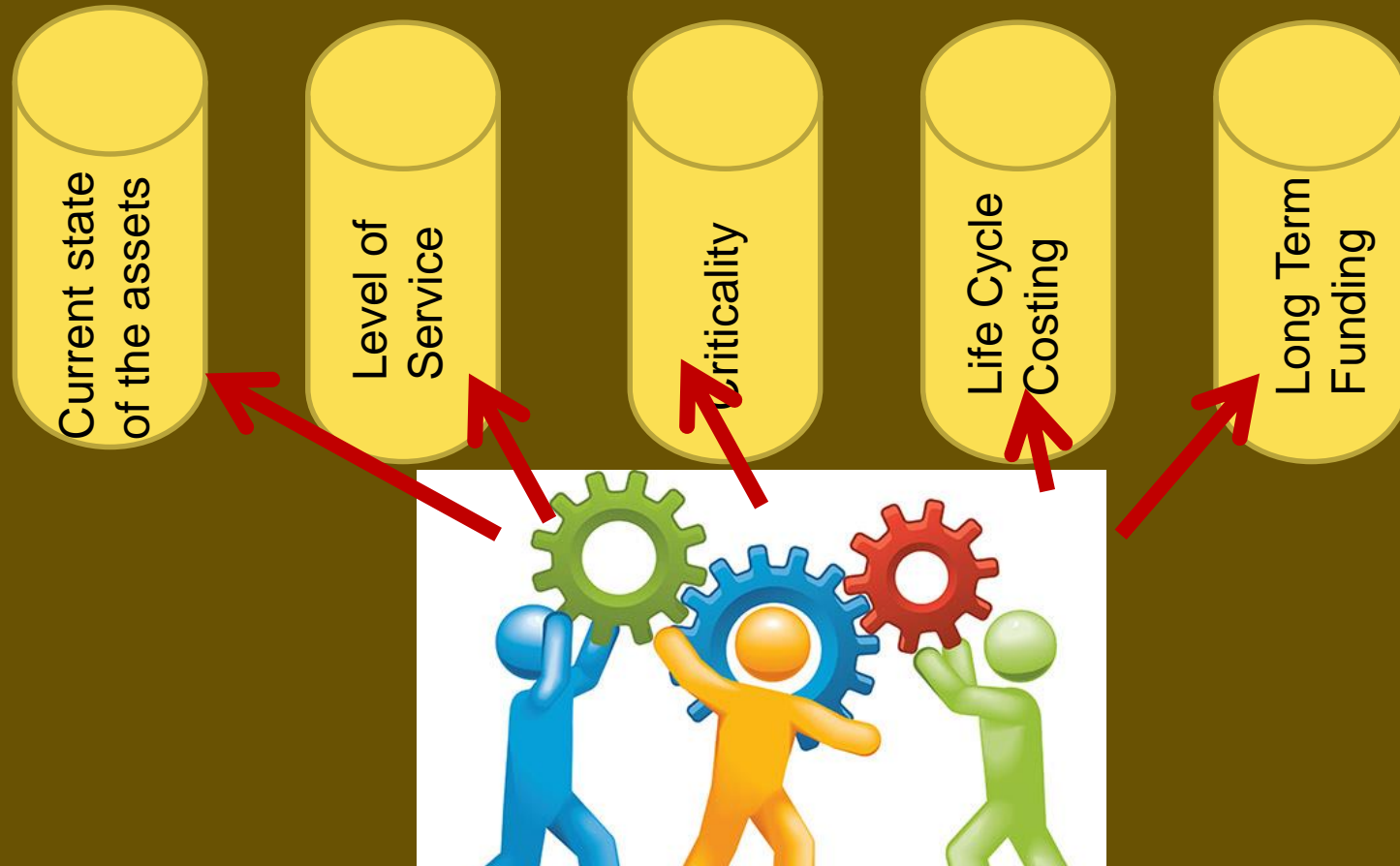
Conserving Water: It's the Right Thing to Do!  
Sign up for your FREE Water-Wise Newsletter. A trained water conservation specialist will evaluate your water-saving devices and irrigation system to find you ways to save water and money. You get free stuff too! Call 1-800-545-1982 today. Visit our website for more water conserving tips - www.cityofpetaluma.net.

**CITY OF PETALUMA**  
Water and Sewer Service  
11 Light Street  
P.O. Box 9511  
Petaluma, CA 94953-0511

RELAY PERIOD: 12/29/2008 - 2/26/2009  
SERVICE ADDRESS: 123 Main St.

AMOUNT ENCLOSED: \$303.00

# Asset Management







City of Petaluma Water and Wastewater Bill [www.cityofpetaluma.net](http://www.cityofpetaluma.net)

Account Number: 555555-55  
BILL DATE: 2/26/2009  
DUE DATE: 3/28/2009

Customer Name: John&Mary Doe  
Service Address: 123 Main St.

**Billing Detail:**  
Summary of Charges from 12/29/2008 - 2/25/2009

Category	Amount
<b>Water Charges</b>	
Tier 1 - (0-18)	\$2.70/hcf
Tier 2 - (19-36)	\$3.10/hcf
Tier 3 - (37-48)	\$3.73/hcf
Tier 4 - (49+)	\$4.13/hcf
Base/Service Charge	\$12.40
<b>Total Water Charges</b>	\$58.30
<b>Wastewater (Sewer) Charges</b>	
Sewer Consumption	\$6.23/hcf
Base/Service Charge	\$26.28
<b>Total Wastewater Charges</b>	\$132.19
<b>Other Charges</b>	
Fire Sprinkler Charge	N/A
Hydrant Charge	N/A
<b>Total Other Charges</b>	\$0.00
<b>Total Charges</b>	<b>\$190.49</b>

Winter Sewer Average 20.00  
\*Rate: 1/4" - 1/2" - 3/4" - 1" - 1 1/2" - 2" - 3" - 4" - 6" - 8" - 10" - 12" - 14" - 16" - 18" - 20" - 24" - 30" - 36" - 42" - 48" - 54" - 60" - 66" - 72" - 78" - 84" - 90" - 96" - 102" - 108" - 114" - 120" - 126" - 132" - 138" - 144" - 150" - 156" - 162" - 168" - 174" - 180" - 186" - 192" - 198" - 204" - 210" - 216" - 222" - 228" - 234" - 240" - 246" - 252" - 258" - 264" - 270" - 276" - 282" - 288" - 294" - 300" - 306" - 312" - 318" - 324" - 330" - 336" - 342" - 348" - 354" - 360" - 366" - 372" - 378" - 384" - 390" - 396" - 402" - 408" - 414" - 420" - 426" - 432" - 438" - 444" - 450" - 456" - 462" - 468" - 474" - 480" - 486" - 492" - 498" - 504" - 510" - 516" - 522" - 528" - 534" - 540" - 546" - 552" - 558" - 564" - 570" - 576" - 582" - 588" - 594" - 600" - 606" - 612" - 618" - 624" - 630" - 636" - 642" - 648" - 654" - 660" - 666" - 672" - 678" - 684" - 690" - 696" - 702" - 708" - 714" - 720" - 726" - 732" - 738" - 744" - 750" - 756" - 762" - 768" - 774" - 780" - 786" - 792" - 798" - 804" - 810" - 816" - 822" - 828" - 834" - 840" - 846" - 852" - 858" - 864" - 870" - 876" - 882" - 888" - 894" - 900" - 906" - 912" - 918" - 924" - 930" - 936" - 942" - 948" - 954" - 960" - 966" - 972" - 978" - 984" - 990" - 996" - 1002" - 1008" - 1014" - 1020" - 1026" - 1032" - 1038" - 1044" - 1050" - 1056" - 1062" - 1068" - 1074" - 1080" - 1086" - 1092" - 1098" - 1104" - 1110" - 1116" - 1122" - 1128" - 1134" - 1140" - 1146" - 1152" - 1158" - 1164" - 1170" - 1176" - 1182" - 1188" - 1194" - 1200" - 1206" - 1212" - 1218" - 1224" - 1230" - 1236" - 1242" - 1248" - 1254" - 1260" - 1266" - 1272" - 1278" - 1284" - 1290" - 1296" - 1302" - 1308" - 1314" - 1320" - 1326" - 1332" - 1338" - 1344" - 1350" - 1356" - 1362" - 1368" - 1374" - 1380" - 1386" - 1392" - 1398" - 1404" - 1410" - 1416" - 1422" - 1428" - 1434" - 1440" - 1446" - 1452" - 1458" - 1464" - 1470" - 1476" - 1482" - 1488" - 1494" - 1500" - 1506" - 1512" - 1518" - 1524" - 1530" - 1536" - 1542" - 1548" - 1554" - 1560" - 1566" - 1572" - 1578" - 1584" - 1590" - 1596" - 1602" - 1608" - 1614" - 1620" - 1626" - 1632" - 1638" - 1644" - 1650" - 1656" - 1662" - 1668" - 1674" - 1680" - 1686" - 1692" - 1698" - 1704" - 1710" - 1716" - 1722" - 1728" - 1734" - 1740" - 1746" - 1752" - 1758" - 1764" - 1770" - 1776" - 1782" - 1788" - 1794" - 1800" - 1806" - 1812" - 1818" - 1824" - 1830" - 1836" - 1842" - 1848" - 1854" - 1860" - 1866" - 1872" - 1878" - 1884" - 1890" - 1896" - 1902" - 1908" - 1914" - 1920" - 1926" - 1932" - 1938" - 1944" - 1950" - 1956" - 1962" - 1968" - 1974" - 1980" - 1986" - 1992" - 1998" - 2004" - 2010" - 2016" - 2022" - 2028" - 2034" - 2040" - 2046" - 2052" - 2058" - 2064" - 2070" - 2076" - 2082" - 2088" - 2094" - 2100" - 2106" - 2112" - 2118" - 2124" - 2130" - 2136" - 2142" - 2148" - 2154" - 2160" - 2166" - 2172" - 2178" - 2184" - 2190" - 2196" - 2202" - 2208" - 2214" - 2220" - 2226" - 2232" - 2238" - 2244" - 2250" - 2256" - 2262" - 2268" - 2274" - 2280" - 2286" - 2292" - 2298" - 2304" - 2310" - 2316" - 2322" - 2328" - 2334" - 2340" - 2346" - 2352" - 2358" - 2364" - 2370" - 2376" - 2382" - 2388" - 2394" - 2400" - 2406" - 2412" - 2418" - 2424" - 2430" - 2436" - 2442" - 2448" - 2454" - 2460" - 2466" - 2472" - 2478" - 2484" - 2490" - 2496" - 2502" - 2508" - 2514" - 2520" - 2526" - 2532" - 2538" - 2544" - 2550" - 2556" - 2562" - 2568" - 2574" - 2580" - 2586" - 2592" - 2598" - 2604" - 2610" - 2616" - 2622" - 2628" - 2634" - 2640" - 2646" - 2652" - 2658" - 2664" - 2670" - 2676" - 2682" - 2688" - 2694" - 2700" - 2706" - 2712" - 2718" - 2724" - 2730" - 2736" - 2742" - 2748" - 2754" - 2760" - 2766" - 2772" - 2778" - 2784" - 2790" - 2796" - 2802" - 2808" - 2814" - 2820" - 2826" - 2832" - 2838" - 2844" - 2850" - 2856" - 2862" - 2868" - 2874" - 2880" - 2886" - 2892" - 2898" - 2904" - 2910" - 2916" - 2922" - 2928" - 2934" - 2940" - 2946" - 2952" - 2958" - 2964" - 2970" - 2976" - 2982" - 2988" - 2994" - 3000" - 3006" - 3012" - 3018" - 3024" - 3030" - 3036" - 3042" - 3048" - 3054" - 3060" - 3066" - 3072" - 3078" - 3084" - 3090" - 3096" - 3102" - 3108" - 3114" - 3120" - 3126" - 3132" - 3138" - 3144" - 3150" - 3156" - 3162" - 3168" - 3174" - 3180" - 3186" - 3192" - 3198" - 3204" - 3210" - 3216" - 3222" - 3228" - 3234" - 3240" - 3246" - 3252" - 3258" - 3264" - 3270" - 3276" - 3282" - 3288" - 3294" - 3300" - 3306" - 3312" - 3318" - 3324" - 3330" - 3336" - 3342" - 3348" - 3354" - 3360" - 3366" - 3372" - 3378" - 3384" - 3390" - 3396" - 3402" - 3408" - 3414" - 3420" - 3426" - 3432" - 3438" - 3444" - 3450" - 3456" - 3462" - 3468" - 3474" - 3480" - 3486" - 3492" - 3498" - 3504" - 3510" - 3516" - 3522" - 3528" - 3534" - 3540" - 3546" - 3552" - 3558" - 3564" - 3570" - 3576" - 3582" - 3588" - 3594" - 3600" - 3606" - 3612" - 3618" - 3624" - 3630" - 3636" - 3642" - 3648" - 3654" - 3660" - 3666" - 3672" - 3678" - 3684" - 3690" - 3696" - 3702" - 3708" - 3714" - 3720" - 3726" - 3732" - 3738" - 3744" - 3750" - 3756" - 3762" - 3768" - 3774" - 3780" - 3786" - 3792" - 3798" - 3804" - 3810" - 3816" - 3822" - 3828" - 3834" - 3840" - 3846" - 3852" - 3858" - 3864" - 3870" - 3876" - 3882" - 3888" - 3894" - 3900" - 3906" - 3912" - 3918" - 3924" - 3930" - 3936" - 3942" - 3948" - 3954" - 3960" - 3966" - 3972" - 3978" - 3984" - 3990" - 3996" - 4002" - 4008" - 4014" - 4020" - 4026" - 4032" - 4038" - 4044" - 4050" - 4056" - 4062" - 4068" - 4074" - 4080" - 4086" - 4092" - 4098" - 4104" - 4110" - 4116" - 4122" - 4128" - 4134" - 4140" - 4146" - 4152" - 4158" - 4164" - 4170" - 4176" - 4182" - 4188" - 4194" - 4200" - 4206" - 4212" - 4218" - 4224" - 4230" - 4236" - 4242" - 4248" - 4254" - 4260" - 4266" - 4272" - 4278" - 4284" - 4290" - 4296" - 4302" - 4308" - 4314" - 4320" - 4326" - 4332" - 4338" - 4344" - 4350" - 4356" - 4362" - 4368" - 4374" - 4380" - 4386" - 4392" - 4398" - 4404" - 4410" - 4416" - 4422" - 4428" - 4434" - 4440" - 4446" - 4452" - 4458" - 4464" - 4470" - 4476" - 4482" - 4488" - 4494" - 4500" - 4506" - 4512" - 4518" - 4524" - 4530" - 4536" - 4542" - 4548" - 4554" - 4560" - 4566" - 4572" - 4578" - 4584" - 4590" - 4596" - 4602" - 4608" - 4614" - 4620" - 4626" - 4632" - 4638" - 4644" - 4650" - 4656" - 4662" - 4668" - 4674" - 4680" - 4686" - 4692" - 4698" - 4704" - 4710" - 4716" - 4722" - 4728" - 4734" - 4740" - 4746" - 4752" - 4758" - 4764" - 4770" - 4776" - 4782" - 4788" - 4794" - 4800" - 4806" - 4812" - 4818" - 4824" - 4830" - 4836" - 4842" - 4848" - 4854" - 4860" - 4866" - 4872" - 4878" - 4884" - 4890" - 4896" - 4902" - 4908" - 4914" - 4920" - 4926" - 4932" - 4938" - 4944" - 4950" - 4956" - 4962" - 4968" - 4974" - 4980" - 4986" - 4992" - 4998" - 5004" - 5010" - 5016" - 5022" - 5028" - 5034" - 5040" - 5046" - 5052" - 5058" - 5064" - 5070" - 5076" - 5082" - 5088" - 5094" - 5100" - 5106" - 5112" - 5118" - 5124" - 5130" - 5136" - 5142" - 5148" - 5154" - 5160" - 5166" - 5172" - 5178" - 5184" - 5190" - 5196" - 5202" - 5208" - 5214" - 5220" - 5226" - 5232" - 5238" - 5244" - 5250" - 5256" - 5262" - 5268" - 5274" - 5280" - 5286" - 5292" - 5298" - 5304" - 5310" - 5316" - 5322" - 5328" - 5334" - 5340" - 5346" - 5352" - 5358" - 5364" - 5370" - 5376" - 5382" - 5388" - 5394" - 5400" - 5406" - 5412" - 5418" - 5424" - 5430" - 5436" - 5442" - 5448" - 5454" - 5460" - 5466" - 5472" - 5478" - 5484" - 5490" - 5496" - 5502" - 5508" - 5514" - 5520" - 5526" - 5532" - 5538" - 5544" - 5550" - 5556" - 5562" - 5568" - 5574" - 5580" - 5586" - 5592" - 5598" - 5604" - 5610" - 5616" - 5622" - 5628" - 5634" - 5640" - 5646" - 5652" - 5658" - 5664" - 5670" - 5676" - 5682" - 5688" - 5694" - 5700" - 5706" - 5712" - 5718" - 5724" - 5730" - 5736" - 5742" - 5748" - 5754" - 5760" - 5766" - 5772" - 5778" - 5784" - 5790" - 5796" - 5802" - 5808" - 5814" - 5820" - 5826" - 5832" - 5838" - 5844" - 5850" - 5856" - 5862" - 5868" - 5874" - 5880" - 5886" - 5892" - 5898" - 5904" - 5910" - 5916" - 5922" - 5928" - 5934" - 5940" - 5946" - 5952" - 5958" - 5964" - 5970" - 5976" - 5982" - 5988" - 5994" - 6000" - 6006" - 6012" - 6018" - 6024" - 6030" - 6036" - 6042" - 6048" - 6054" - 6060" - 6066" - 6072" - 6078" - 6084" - 6090" - 6096" - 6102" - 6108" - 6114" - 6120" - 6126" - 6132" - 6138" - 6144" - 6150" - 6156" - 6162" - 6168" - 6174" - 6180" - 6186" - 6192" - 6198" - 6204" - 6210" - 6216" - 6222" - 6228" - 6234" - 6240" - 6246" - 6252" - 6258" - 6264" - 6270" - 6276" - 6282" - 6288" - 6294" - 6300" - 6306" - 6312" - 6318" - 6324" - 6330" - 6336" - 6342" - 6348" - 6354" - 6360" - 6366" - 6372" - 6378" - 6384" - 6390" - 6396" - 6402" - 6408" - 6414" - 6420" - 6426" - 6432" - 6438" - 6444" - 6450" - 6456" - 6462" - 6468" - 6474" - 6480" - 6486" - 6492" - 6498" - 6504" - 6510" - 6516" - 6522" - 6528" - 6534" - 6540" - 6546" - 6552" - 6558" - 6564" - 6570" - 6576" - 6582" - 6588" - 6594" - 6600" - 6606" - 6612" - 6618" - 6624" - 6630" - 6636" - 6642" - 6648" - 6654" - 6660" - 6666" - 6672" - 6678" - 6684" - 6690" - 6696" - 6702" - 6708" - 6714" - 6720" - 6726" - 6732" - 6738" - 6744" - 6750" - 6756" - 6762" - 6768" - 6774" - 6780" - 6786" - 6792" - 6798" - 6804" - 6810" - 6816" - 6822" - 6828" - 6834" - 6840" - 6846" - 6852" - 6858" - 6864" - 6870" - 6876" - 6882" - 6888" - 6894" - 6900" - 6906" - 6912" - 6918" - 6924" - 6930" - 6936" - 6942" - 6948" - 6954" - 6960" - 6966" - 6972" - 6978" - 6984" - 6990" - 6996" - 7002" - 7008" - 7014" - 7020" - 7026" - 7032" - 7038" - 7044" - 7050" - 7056" - 7062" - 7068" - 7074" - 7080" - 7086" - 7092" - 7098" - 7104" - 7110" - 7116" - 7122" - 7128" - 7134" - 7140" - 7146" - 7152" - 7158" - 7164" - 7170" - 7176" - 7182" - 7188" - 7194" - 7200" - 7206" - 7212" - 7218" - 7224" - 7230" - 7236" - 7242" - 7248" - 7254" - 7260" - 7266" - 7272" - 7278" - 7284" - 7290" - 7296" - 7302" - 7308" - 7314" - 7320" - 7326" - 7332" - 7338" - 7344" - 7350" - 7356" - 7362" - 7368" - 7374" - 7380" - 7386" - 7392" - 7398" - 7404" - 7410" - 7416" - 7422" - 7428" - 7434" - 7440" - 7446" - 7452" - 7458" - 7464" - 7470" - 7476" - 7482" - 7488" - 7494" - 7500" - 7506" - 7512" - 7518" - 7524" - 7530" - 7536" - 7542" - 7548" - 7554" - 7560" - 7566" - 7572" - 7578" - 7584" - 7590" - 7596" - 7602" - 7608" - 7614" - 7620" - 7626" - 7632" - 7638" - 7644" - 7650" - 7656" - 7662" - 7668" - 7674" - 7680" - 7686" - 7692" - 7698" - 7704" - 7710" - 7716" - 7722" - 7728" - 7734" - 7740" - 7746" - 7752" - 7758" - 7764" - 7770" - 7776" - 7782" - 7788" - 7794" - 7800" - 7806" - 7812" - 7818" - 7824" - 7830" - 7836" - 7842" - 7848" - 7854" - 7860" - 7866" - 7872" - 7878" - 7884" - 7890" - 7896" - 7902" - 7908" - 7914" - 7920" - 7926" - 7932" - 7938" - 7944" - 7950" - 7956" - 7962" - 7968" - 7974" - 7980" - 7986" - 7992" - 7998" - 8004" - 8010" - 8016" - 8022" - 8028" - 8034" - 8040" - 8046" - 8052" - 8058" - 8064" - 8070" - 8076" - 8082" - 8088" - 8094" - 8100" - 8106" - 8112" - 8118" - 8124" - 8130" - 8136" - 8142" - 8148" - 8154" - 8160" - 8166" - 8172" - 8178" - 8184" - 8190" - 8196" - 8202" - 8208" - 8214" - 8220" - 8226" - 8232" - 8238" - 8244" - 8250" - 8256" - 8262" - 8268" - 8274" - 8280" - 8286" - 8292" - 8298" - 8304" - 8310" - 8316" - 8322" - 8328" - 8334" - 8340" - 8346" - 8352" - 8358" - 8364" - 8370" - 8376" - 8382" - 8388" - 8394" - 8400" - 8406" - 8412" - 8418" - 8424" - 8430" - 8436" - 8442" - 8448" - 8454" - 8460" - 8466" - 8472" - 8478" - 8484" - 8490" - 8496" - 8502" - 8508" - 8514" - 8520" - 8526" - 8532" - 8538" - 8544" - 8550" - 8556" - 8562" - 8568" - 8574" - 8580" - 8586" - 8592" - 8598" - 8604" - 8610" - 8616" - 8622" - 8628" - 8634" - 8640" - 8646" - 8652" - 8658" - 8664" - 8670" - 8676" - 8682" - 8688" - 8694" - 8700" - 8706" - 8712" - 8718" - 8724" - 8730" - 8736" - 8742" - 8748" - 8754" - 8760" - 8766" - 8772" - 8778" - 8784" - 8790" - 8796" - 8802" - 8808" - 8814" - 8820" - 8826" - 8832" - 8838" - 8844" - 8850" - 8856" - 8862" - 8868" - 8874" - 8880" - 8886" - 8892" - 8898" - 8904" - 8910" - 8916" - 8922" - 8928" - 8934" - 8940" - 8946" - 8952" - 8958" - 8964" - 8970" - 8976" - 8982" - 8988" - 8994" - 9000" - 9006" - 9012" - 9018" - 9024" - 9030" - 9036" - 9042" - 9048" - 9054" - 9060" - 9066" - 9072" - 9078" - 9084" - 9090" - 9096" - 9102" - 9108" - 9114" - 9120" - 9126" - 9132" - 9138" - 9144" - 9150" - 9156" - 9162" - 9168" - 9174" - 9180" - 9186" - 9192" - 9198" - 9204" - 9210" - 9216" - 9222" - 9228" - 9234" - 9240" - 9246" - 9252" - 9258" - 9264" - 9270" - 9276" - 9282" - 9288" - 9294" - 9300" - 9306" - 9312" - 9318" - 9324" - 9330" - 9336" - 9342" - 9348" - 9354" - 9360" - 9366" - 9372" - 9378" - 9384" - 9390" - 9396" - 9402" - 9408" - 9414" - 9420" - 9426" - 9432" - 9438" - 9444" - 9450" - 9456" - 9462" - 9468" - 9474" - 9480" - 9486" - 9492" - 9498" - 9504" - 9510" - 9516" - 9522" - 9528" - 9534" - 9540" - 9546" - 9552" - 9558" - 9564" - 9570" - 9576" - 9582" - 9588" - 9594" - 9600" - 9606" - 9612" - 9618" - 9624" - 9630" - 9636" - 9642" - 9648" - 9654" - 9660" - 9666" - 9672" - 9678" - 9684" - 9690" - 9696" - 9702" - 9708" - 9714" - 9720" - 9726" - 9732" - 9738" - 9744" - 9750" - 9756" - 9762" - 9768" - 9774" - 9780" - 9786" - 9792" - 9798" - 9804" - 9810" - 9816" - 9822" - 9828" - 9834" - 9840" - 9846" - 9852" - 9858" - 9864" - 9870" - 9876" - 9882" - 9888" - 9894" - 9900" - 9906" -



# Today's Topic

*Aging Infrastructure  
What it is and What  
to Do About it*



“America’s  
*Infrastructure*  
is *Aging*”

Do any of  
these sound  
familiar?

“How will we deal  
with *Aging*  
*Infrastructure*”

“We have a  
problem with *Aging*  
*Infrastructure*”

# D

## for Drinking Water Infrastructure

2013 | **REPORT CARD** for **america's INFRASTRUCTURE**

**ASCE**  
AMERICAN SOCIETY OF CIVIL ENGINEERS



**LAUNCH THE REPORT CARD >**

**HOME**

**GRADES**

**STATES**

**NEWS**

**TAKE ACTION**

**EXPLORE ASCE'S 2013 REPORT CARD FOR AMERICA'S INFRASTRUCTURE ONLINE!**

- > GRADES
- > STATE
- > VIDEOS
- > INTERACTIVE CHARTS

**LAUNCH THE REPORT CARD**



Source: <http://www.infrastructurereportcard.org/>



# Do the grades tell the whole story?



Source: <http://www.infrastructurereportcard.org/>

# Considerations with Aging Infrastructure

What does  
“aging”  
really  
mean

Even with  
“aging”  
assets, not  
all assets  
perform the  
same

Individual  
Assets vs.  
whole  
system

Need to  
think  
about all  
asset  
classes:  
Vertical &  
Horizontal

Need for  
evidence  
based or  
data based  
decisions,  
rather  
than “gut”  
reactions




**What  
characteristic  
best defines  
aging  
infrastructure?**



# What characteristic best defines aging infrastructure?

- A. Age of Infrastructure
- B. Useful Life
- C. Material of Manufacture and Installation
- D. Not Sure





What we're really  
talking about is  
"Useful life"

"Age" is not the best  
indicator

# What goes into useful life estimates?

What we want the asset to do

Condition

Materials,  
Manufacturing &  
Installation

Manufacturer's estimates of  
length of service

Usage History

Maintenance History

Repair History

What do we want  
the asset to do?

Can it still perform  
at desired levels?



Minimum Pressure

Number of breaks per mile of main  
Or  
Number of service interruptions per  
customer or per year



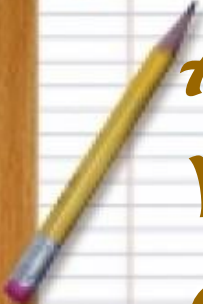
Meeting Regulatory  
Requirements



Assets need to be  
viewed  
individually not  
as an aggregate



# Asset Performance



*Assets  
within a  
class can  
perform  
very  
differently*

*Why?*

*Why does  
it matter?*

# Classes of Assets



**What types of  
assets are of  
most concern?**





# What type of asset is/are of most concern to you?

- A. Water Distribution Piping
- B. Storage Tanks
- C. Wells/Surface Water Intake
- D. Treatment System Components
- E. Other/Don't Operate a Water System



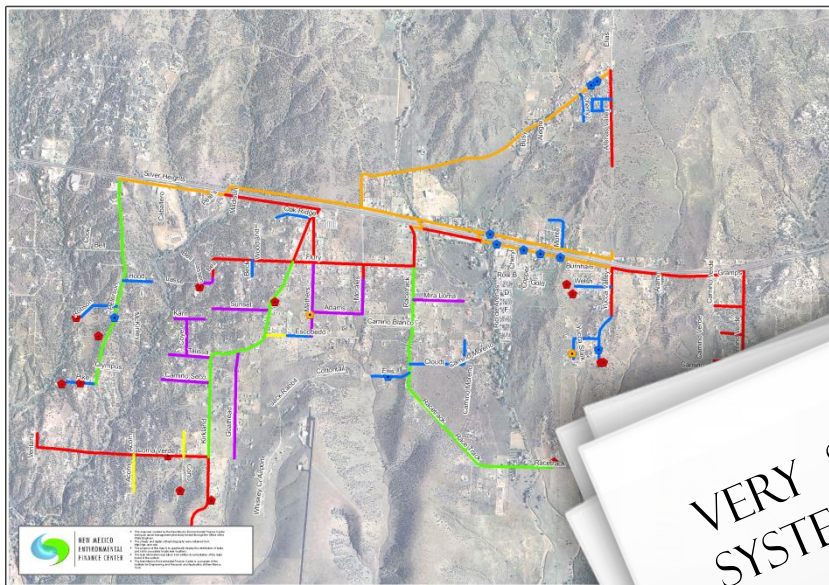
What to do about Aging Infrastructure is often



viewed as A Choice Between Two Extremes

REPLACE  
ALL THE  
INFRASTRUCTURE









Is replacement  
really necessary?

What are the  
consequences of  
early  
replacement?

PUSH OFF  
INFRASTRUCTURE  
REPLACEMENT/  
IGNORE NEED FOR  
REPLACEMENT







Remember this event?





What's their replacement cycle?





# 300 Years

What's their replacement cycle?

Why 300  
Years?





Why 300  
Years?

Saves  
Money

Why 300  
Years?

But Does  
it??????

# Cost of Deferred Replacement

Pipe still has to be replaced after it breaks

Replacement  
on an  
emergency  
basis much  
higher

Damages have  
to be paid

Social Cost

Costs  
Associated with  
Emergency

Costs of Lost  
Water/Lost  
Revenue



Is your utility more like the first case or the second?



# Would you describe your utility's asset replacement program as:

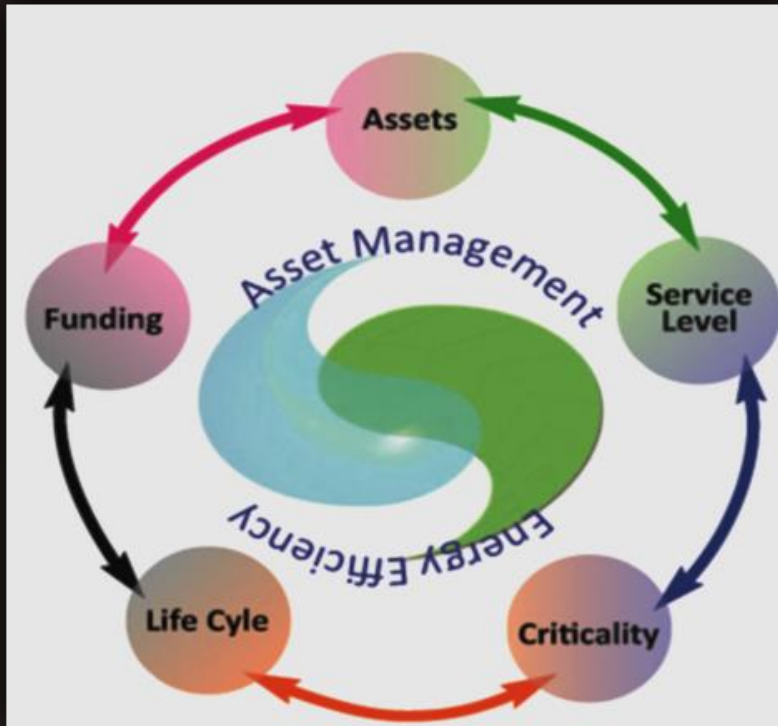
- A. Similar to the approach of replacing all the infrastructure at once.
- B. Similar to the approach of a “300 year” replacement cycle (i.e. deferring replacements for a long period)
- C. Replacing an appropriate amount of infrastructure each year
- D. Using an asset management approach to infrastructure replacement
- E. Other/Not a water system

IF WE DON'T  
WANT TO REPLACE  
TOO EARLY  
(WASTING  
RESOURCES) AND  
WE DON'T WANT  
TO REPLACE TOO  
LATE..... WHAT IS  
THE ANSWER?

WE NEED TO USE  
ASSET  
MANAGEMENT  
PRINCIPLES TO  
DETERMINE THE  
BEST TIME AND  
BEST WAY TO  
REPLACE OUR  
INFRASTRUCTURE

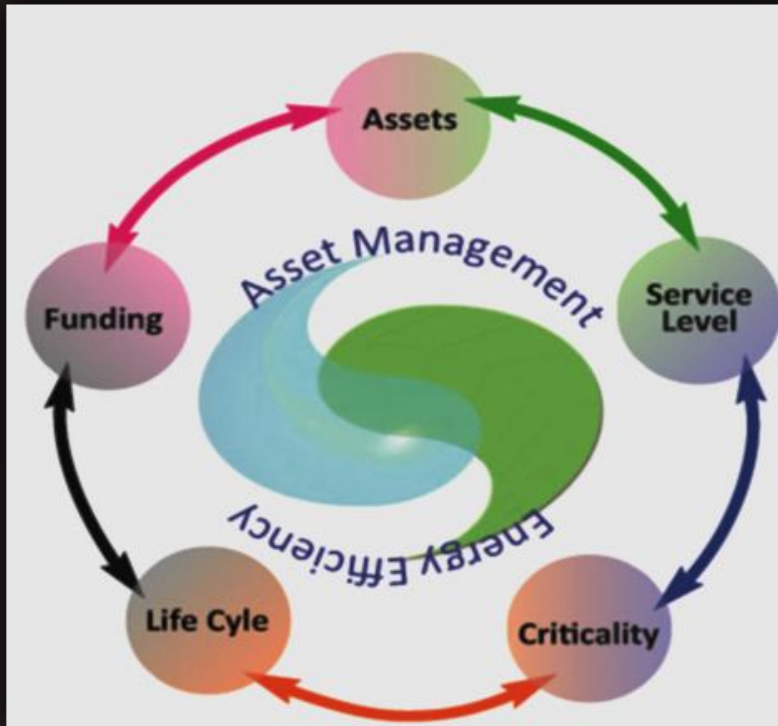


# The 5 Core Components of Asset Management



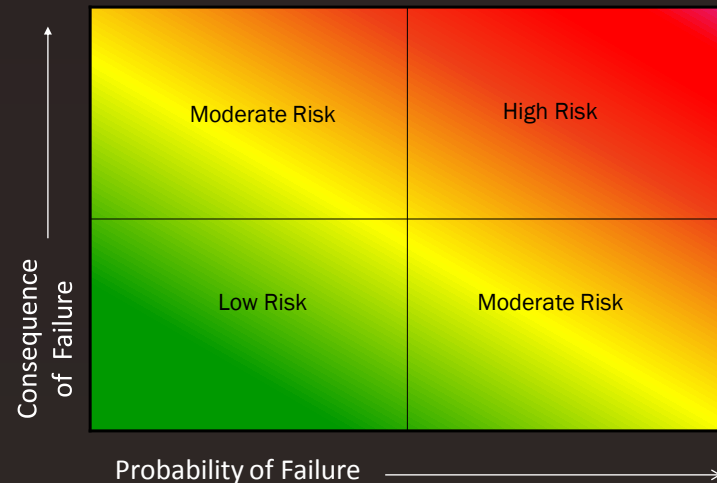
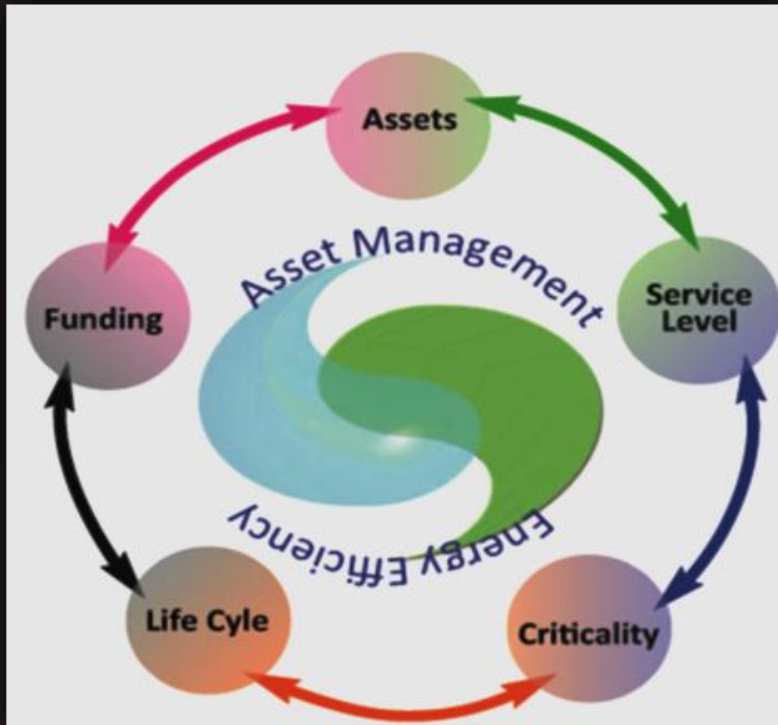
**CURRENT STATE OF THE  
ASSETS**

# The 5 Core Components of Asset Management



**LEVEL OF SERVICE**

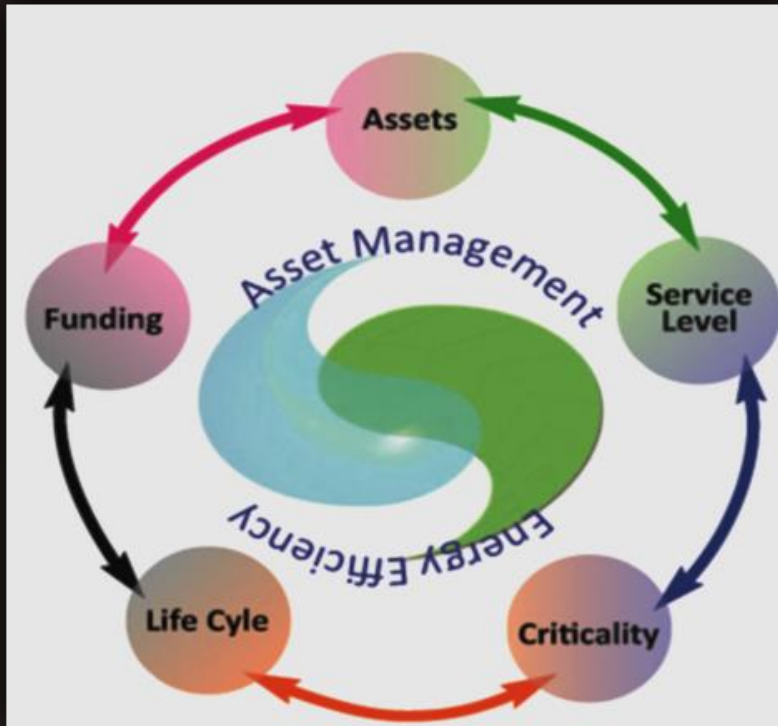
# The 5 Core Components of Asset Management



## CRITICALITY

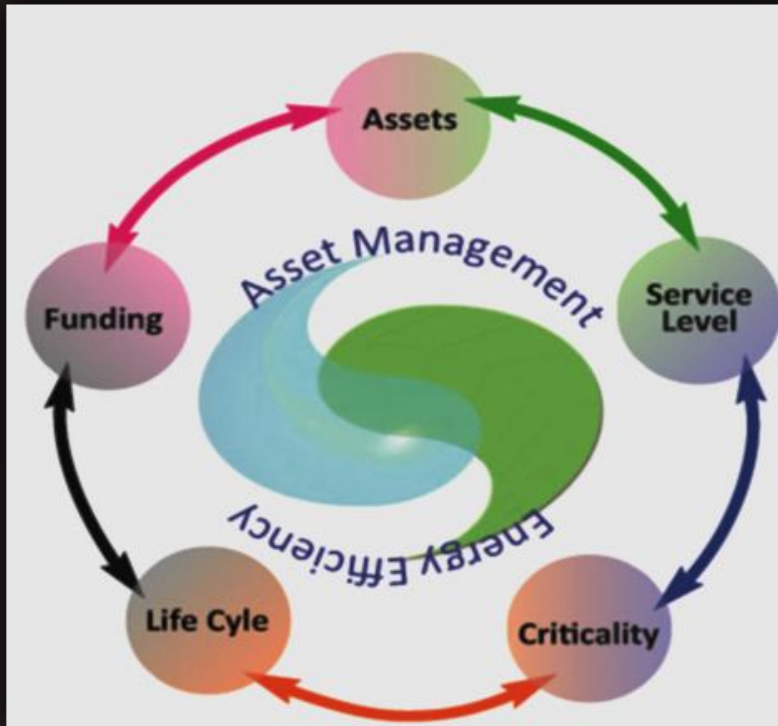


# The 5 Core Components of Asset Management



**LIFE CYCLE  
COSTING**

# The 5 Core Components of Asset Management



**FUNDING**




One of the key factors is risk



# Risk Based Decisions

If we choose wisely about what to fix we will have greater impact





Asset management  
can find the  
optimal  
replacement  
period and  
methodology.....



# Leadership

A **leader** is a person who has the ability to motivate a group of people to achieve a common goal through intentional influence.



# Community Support







An aerial photograph of a small, rural community. In the lower-left foreground, a tall, white water tower stands prominently. The community is spread out across a flat landscape, with several houses and buildings visible. A notable church with a red roof and a tall steeple is located on the right side of the image. The surrounding area consists of large, open fields, some of which are brown and plowed, while others are green. A straight road or path runs through the center of the community, intersecting with other roads. The overall scene depicts a typical small-town or rural setting.

**Drinking Water  
Infrastructure Is the  
foundation of our  
communities**





It's time to change the message



A photograph of a clear glass filled with water, set against a light gray background. A large, semi-transparent white oval with a thick red border is centered over the glass. Inside the oval, the text "Paying for water is an investment" is written in a bold, black, sans-serif font. The glass is slightly out of focus, and the water level is visible. The overall composition is simple and direct, emphasizing the text message.

**Paying for water is  
an investment**





**Keeps our families healthy**

**Provides for community's economic well-being**

**Allows for recreation**

**Keeps the value of our houses or property**

**Enables a good quality of life**

It won't be  
easy, but it  
is necessary



# TAKING IT TO YOUR FACILITY

## TO DO....

- ❖ Start thinking in an asset management way
- ❖ Change how you think about your infrastructure



# TAKING IT TO YOUR FACILITY

## TO DO....

- ❖ **Seek out Asset Management training**
- ❖ **EFCN Webinars, In-person Trainings, On-line Resources**
- ❖ **Lots of other resources (EPA, AWWA, etc.)**

# TAKING IT TO YOUR FACILITY

## TO DO....

- ❖ **Consider ways to build community support for necessary infrastructure replacement projects**
- ❖ **Consider ways to improve the leadership of water infrastructure**

# TAKING IT TO YOUR FACILITY

**TO DO....**



- ❖ **Change the mindset to water as an investment in all interactions with decision-makers and the public**



# TAKING IT TO YOUR FACILITY

## TO DO....

- ❖ **Examine current rate structure in a complete and thorough fashion**
  - ❖ **Does it cover the full cost of operation?**
  - ❖ **Does it cover adequate infrastructure replacement?**
  - ❖ **Does it increase over time?**

**We Want to  
Thank EPA for  
Providing  
Funding for  
this Project**



# CONTACT US

**HEATHER HIMMELBERGER**

**heatherh@unm.edu**

**DAWN NALL**

**efcnall@gmail.com**



**Smart Management for  
Small Water Systems**



**Southwest  
Environmental  
Finance  
Center**