



**SCOTTSDALE UNIFIED SCHOOL DISTRICT
ENERGY ANALYTICS AND EFFICIENCY**





Agenda

- Introductions & Backgrounds
- Who is Midstate Energy?
- Company Focus
- Our Process/Steps
 - Crawl, Walk, Run
- Self Funded Project





Who is Midstate?

- Midstate is an Arizona based Company with a 30 Year History
- Ranked #1 by Ranking Arizona Magazine & The Business Journal-12 years in a row
- Projects with over 70 Arizona School Districts
- Three Divisions
 - Mechanical
 - Service
 - Energy





Focus

- **Our Energy Efficiency Professional Staff Emphasize and Focus on Sustainable Results...**
- **Crawl, Walk, Run**
 - Moving and analyzing from *simple* to *complex* solutions
- **Midstate Energy's Focus**
 - Measurement and Monitoring of energy usage, Analytics
 - Electrical Improvements, lighting, smart buildings
 - Water Usage Improvements, exterior and interior
 - Mechanical Improvements, HVAC, Central plants, Cogeneration, micro plants
 - Building Control Systems and strategies
 - Renewables
 - Creative funding solutions, Performance Contracting





Preliminary Observations

Of the 23 Campuses not slated for rebuild...

- Opportunity with electric rate adjustments
- Opportunity with water conservation and lighting
- Data analytics and tracking opportunities
- Revisit solar contracts
- Continued improvements in technology (electrical & mechanical)
- Opportunities in mechanical plants



In these initial steps, “Keep it Simple” and build a solid foundation (easy to determine utility reductions)

Energy Conservation Measures

Data Analytics, Water Efficiency, LED Lighting



Phase I - Data

- **Data Analytics-** Getting one's House In Order = Measuring and monitoring utility usage
 - Fuse box Software
 - Utility bill analysis
 - EMS oversight
 - Energy standards
 - Energy strategies
 - Solar optimization
 - Ongoing partnership process

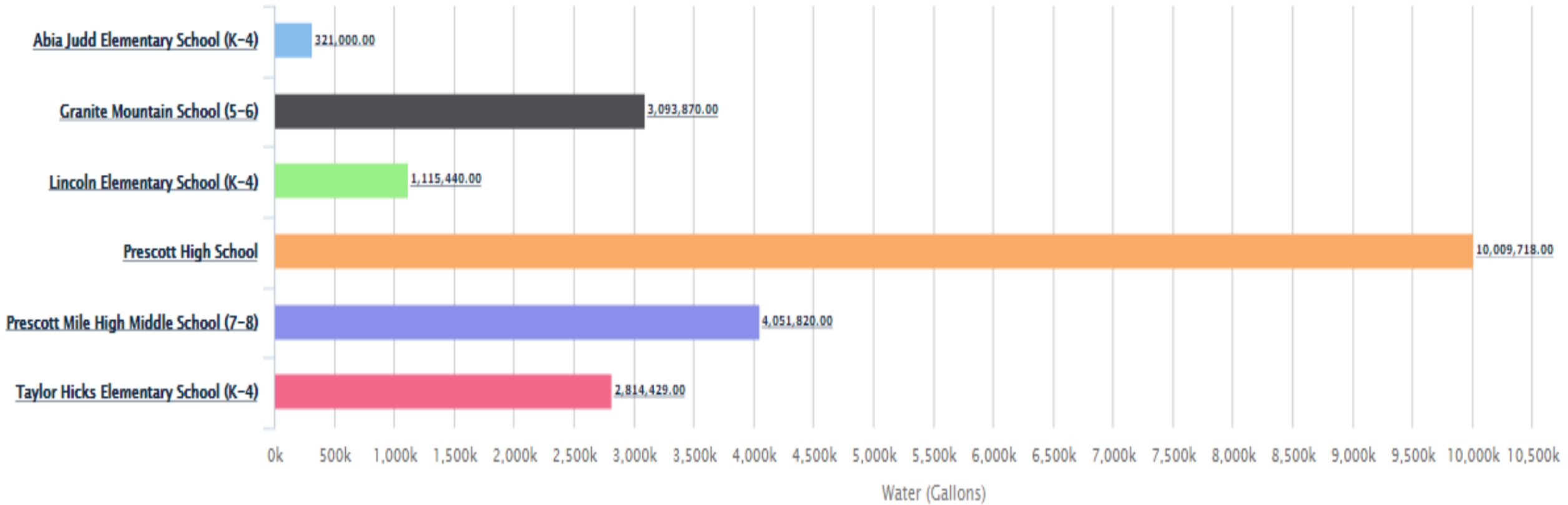




Data Monitoring Example

Water Comparison by Location

07-01-2013 to 06-30-2014





Data Monitoring Example

Location Type

--All--

Water Type

Total Water

Criteria

Month

Quarter

Year

Select Year

2015

Compare with

2014

Search

[Jul 2014 - Dec 2014 Compare with Jul 2013 - Dec 2013] as per last data uploaded date 12/23/2014

Location ÷	2015		2014		Percentage Change	
	Total Usage (gallons) ÷	Total Cost (\$) ÷	Total Usage(gallons) ÷	Total Cost (\$) ÷	Usage ÷	Cost ÷
Abia Judd Elementary School (K-4)	142,000	2,289.92	159,000	2,374.75	10.69%↓	3.57%↓
Granite Mountain School (5-6)	1,649,250	14,230.66	1,685,370	10,264.81	2.14%↓	38.64%↑
Lincoln Elementary School (K-4)	326,180	3,574.71	707,830	6,835.18	53.92%↓	47.70%↓
Prescott High School	5,731,550	47,966.00	4,393,148	39,880.05	30.47%↑	20.28%↑
Prescott Mile High Middle School (7-8)	2,370,160	15,220.26	2,421,520	15,150.35	2.12%↓	0.46%↑
Taylor Hicks Elementary School (K-4)	1,888,400	12,945.83	1,222,982	9,793.97	54.41%↑	32.18%↑



Phase I - Water

➤ Water

- Stewardship of the Environment
- Sustainability
- Maximize consumption reduction opportunities
 - » Toilet retrofit and replacement
 - » Urinal retrofit and replacement
 - » Faucet retrofit and replacement
 - » Showerhead replacements
 - » Pre-Rinse sprayer replacement
 - » Garbage disposal retrofit





Phase I

Existing Lighting Conditions

Interior

Currently the district is nearly 50/50 with the amount of fixtures that have 1st – 2nd generation 32W T8 vs 3rd generation 28W T8 lighting systems. There are also a few locations that have 3rd generation 25W T8 and 28W T5 lighting systems as well. Most gyms have 4L - 6L 54W T5 HO high-bays. There is one gym and a few multi-purpose rooms with 400W metal halide or 250W metal halide high-bays present. Most of the recessed lighting, vanity bars, keyless fixtures and drum fixtures contain various wattages of compact fluorescent lamps, with very few still having incandescent lamps. Very few fixtures are LED. Occupancy sensors are present throughout the district.

Exterior

The majority is currently various LED fixtures. There are also many induction fixtures of various wattages. 54W T5 HO vapor tight and strip fixtures can be found in many canopies. There is still some older, inefficient metal halide and high pressure sodium lamps in pole lights, wall packs, flood lights, bollards and can/canopy fixtures, but many of these types of fixtures have compact fluorescent lamps in them as well.



Phase I - LED Lighting Option

Lighting - LED Retrofit Kits in Classrooms, LED Tubes and drivers

- **Interior-** All Classroom spaces would be retrofit to Phillips LED EVOKIT EasySense. All remaining T8 lighting would be retrofit with new 12W LED lamps and LED drivers. Gyms would receive LED high-bays. Recessed lighting, vanity bars, keyless fixtures and drum fixtures would be converted to new LED fixtures or re-lamped with LED lamps.
 - EvoKit benefits - LED retrofit kit:
 - Standardization - Also comes in a new fixture model, allowing district to have the same aesthetics in building new schools
- **Exterior-** Any existing fixtures that are not currently LED will be replaced with new LED fixtures or retrofit with LED lamps.
- **Benefits:**
 - Classroom equity
 - Enhanced learning environment
 - 36 watts per kit
 - 10 year warranty
 - 70,000 hours rated life
 - Daylight Harvesting
 - Calculates runtime and life expectancy
 - Dimmable 'Tunable' - Phillips phone App
 - Occupancy sensing
 - Standardization to new Build



Funding

Performance Contracting concept is simple...

- Reduced and avoided costs on energy and operating expenses pay for building improvements. Reinvested dollars Guaranteed by statute
- **SELF FUNDED CAPITAL IMPROVMENTS**
- Typically a ten to fifteen year financing package(s) based on analytics
- Midstate and SUSD *partner* to maximize the benefits over the long term- *Ongoing relationship*



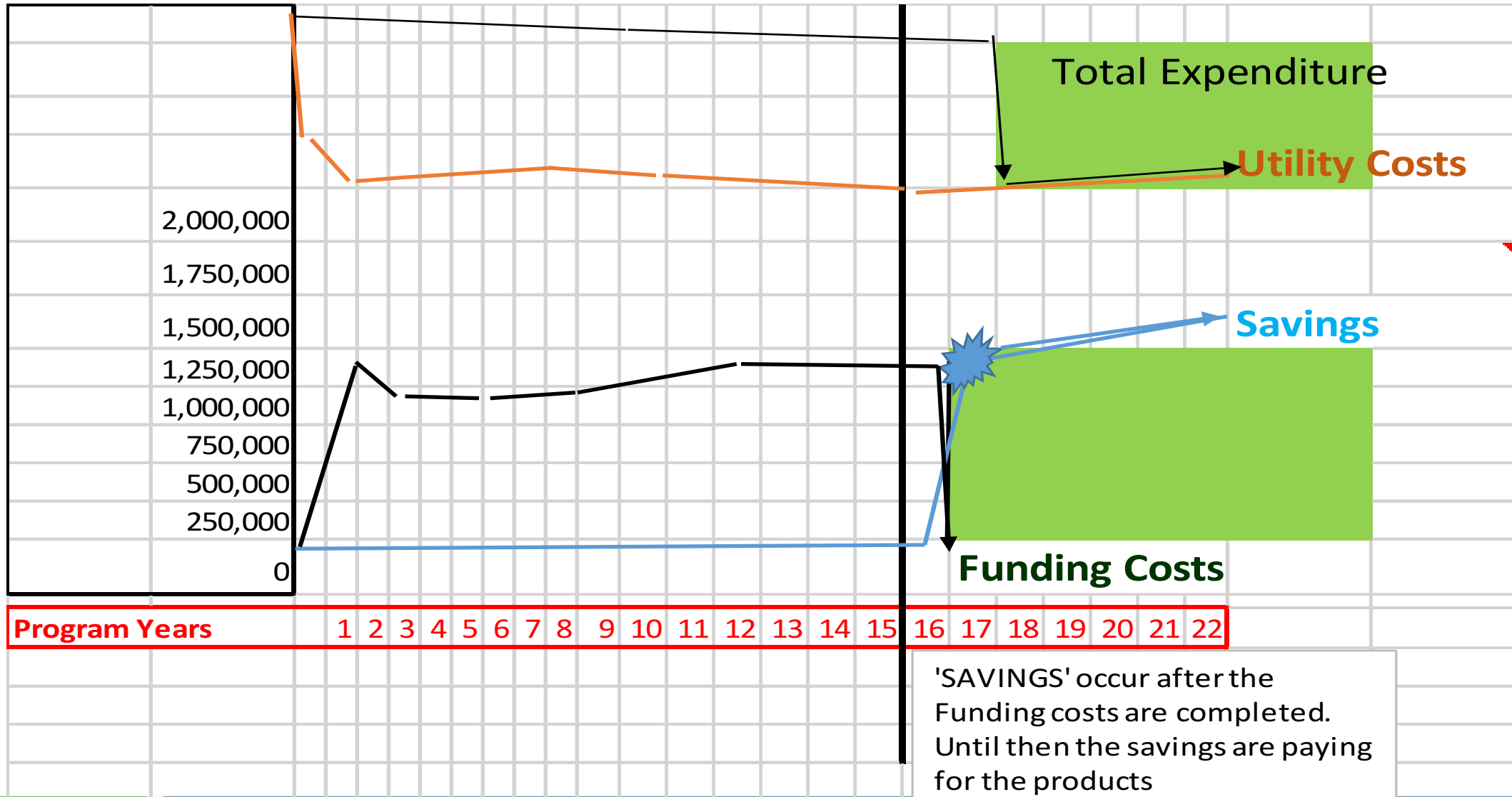


Sample Financial Projections

Financial Projections	
Total Project Cost	\$15,532,275
Owner Contribution	\$0
Project Cost	\$15,532,275
M&V	\$10,000
Estimated Energy Avoidance	\$942,966
Additional Savings	\$25,000
Potential Rebates & Incentives	\$550,000
Finance Term	15.0 Yr.s
Interest Rate	2.33%
Inflation Factor	3.40%



Self Funded Capital Project Example





Next Step

- Proposal to District Stakeholders –
 - Data management, LED lighting and water efficiency
- Approximately 1mm in annual kWh and water reductions
 - Avoided costs are reinvested pay for the project
- Utility Rebates approximately \$500,000.00
 - Used to offset the Project financially

SELF FUNDED CAPITAL IMPROVEMENT PROJECT





Snapshot of where are we now

December 2014 - November 2015		ELE APS/SRP	SW Gas	Water/Sewer- City of Scottsdale, Tempe	Grand Totals				
#	Site Name	Electric \$	Natural Gas \$	\$	\$	# of Stude	SQ. FT.	TOTAL Cost/S	TOTAL Cost/S
1	Anasazi Elementary School	\$39,795.49	\$2,991.54	\$29,312.67	\$72,099.70	606	70833	\$118.98	\$1.02
3	Arcadia High School	\$289,077.89	\$5,407.45	\$115,530.73	\$410,016.07	1759	265407	\$233.10	\$1.54
4	Arcadia Neighborhood Learning Center (ANLC)	\$81,531.37	\$0.00	\$28,266.43	\$109,797.80	496	55664	\$221.37	\$1.97
5	Chaparral High School	\$364,753.35	\$10,493.63	\$92,409.54	\$467,656.52	2104	336289	\$222.27	\$1.39
6	Cherokee Elementary School	\$56,560.96	\$1,565.34	\$58,933.06	\$117,059.36	598	77374	\$195.75	\$1.51
7	Cheyenne Traditional School	\$60,776.86	\$3,081.71	\$34,159.40	\$98,017.97	1002	80757	\$97.82	\$1.21
8	Cochise Elementary School	\$100,189.84	\$0.00	\$103,748.38	\$203,938.22	636	83366	\$320.66	\$2.45
9	Cocopah Middle School	\$191,643.64	\$0.00	\$43,739.44	\$235,383.08	888	174600	\$265.07	\$1.35
10	Copper Ridge School	\$167,504.76	\$4,879.41	\$89,109.78	\$261,493.95	1139	181300	\$229.58	\$1.44
11	Coronado High School	\$377,310.75	\$8,855.35	\$82,384.67	\$468,550.77	1057	300494	\$443.28	\$1.56
12	Desert Canyon Elementary & Middle School	\$176,470.68	\$8,294.24	\$50,849.38	\$235,614.30	1042	190000	\$226.12	\$1.24
13	Desert Mountain High School	\$0.00	\$5,859.53	\$70,636.46	\$76,495.99	1800	262500	\$42.50	\$0.29
15	Ingleside Middle School	\$104,176.12		\$36,814.56	\$140,990.68	766	112120	\$184.06	\$1.26
16	Laguna Elementary School	\$40,447.94	\$2,418.60	\$41,371.06	\$84,237.60	533	74756	\$158.04	\$1.13
17	Mohave Middle School	\$156,139.63	\$1,350.67	\$38,726.55	\$196,216.85	790	163501	\$248.38	\$1.20
18	Mountainside Middle School	\$384,301.89	\$19,647.52	\$72,674.11	\$476,623.52	691	152311	\$689.76	\$3.13
19	Redfield Elementary School	\$41,360.58	\$3,291.94	\$20,279.27	\$64,931.79	462	61814	\$140.55	\$1.05
20	Saguaro High School	\$328,236.86	\$10,611.69	\$89,688.88	\$428,537.43	2080	299511	\$206.03	\$1.43
21	Sequoia Elementary School	\$33,776.00	\$5,187.80	\$34,127.77	\$73,091.57	480	65685	\$152.27	\$1.11
22	Supai Middle School	\$148,074.33	\$7,068.59	\$28,249.42	\$183,392.34	657	116352	\$279.14	\$1.58
23	Tavan Elementary School	\$102,716.35	\$1,775.75	\$25,204.11	\$129,696.21	771	80249	\$168.22	\$1.62
24	Tonalea Elementary School	\$72,174.61	\$2,339.18	\$23,785.13	\$98,298.92	377	41421	\$260.74	\$2.37
25	Yavapai Elementary School	\$82,071.58	\$0.00	\$22,557.48	\$104,629.06	432	65819	\$242.20	\$1.59
26	Apache	\$28,534.00	\$0.00	\$6,861.00	\$35,395.00	380	44395	\$93.14	\$0.80
27	Hohokam	\$91,384.00	\$4,162.00	\$8,630.00	\$104,176.00	484	77030	\$215.24	\$1.35
28	Hopi	\$78,718.00	\$0.00	\$19,503.00	\$98,221.00	852	60992	\$115.28	\$1.61
29	Kiva	\$126,690.00	\$2,167.00	\$28,868.00	\$157,725.00	500	63091	\$315.45	\$2.50
30	Navajo	\$97,665.00	\$0.00	\$7,019.00	\$104,684.00	381	78106	\$274.76	\$1.34
31	Pima	\$91,372.00	\$0.00	\$11,560.00	\$102,932.00	542	70107	\$189.91	\$1.47
32	Pueblo	\$102,359.00	\$0.00	\$6,943.00	\$109,302.00	541	73095	\$202.04	\$1.50
	Totals	\$4,015,813.48	\$111,448.94	1,321,942	\$5,449,204.70	24846	3778939	\$225.06	\$1.50