



ANALYSIS OF SUSTAINABILITY IMPACTS OF **Alameda County Supply Chain Expenditures**

Executive Summary



Alameda County

SUSTAINABILITY

Local Action, Global Impact.

Prepared by **Good Company**
April 2019



Introduction

Alameda County, California is a national leader in local government sustainability, and has taken great strides towards addressing its climate footprint related to government operations. To further these efforts, the County conducted an analysis to better understand the climate, human health, and other sustainability impacts related to County's supply chain purchases.

The County contracted with Good Company¹ to perform a supply chain analysis that quantifies the environmental impacts associated with the County's fiscal year (FY) 2014-2015 financial expenditures. Purchases considered in the analysis include procurement of all material goods, food, utilities, and professional services used in the course of County operations. The analysis also includes County expenditures for community-based services that comprise the community's social safety net.

To perform the analysis, Good Company utilized a new, publicly-available environmental lifecycle assessment tool² from U.S. Environmental Protection Agency (EPA). The tool provides detailed information on impacts for over 400 sectors of the U.S. economy. The tool provides impact factors per dollar spent based on national data from federal sources. These factors, when combined with the County's Fiscal Year 2014/2015 expenditure data, provide an estimate of the lifecycle impacts of the County's supply chain expenditures for six impact metrics – greenhouse gases (GHG), particulate matter (PM), ozone, acid rain, human toxicity, and water use.

The County recognizes its important role in providing government services to the community in a manner that enhances its environmental stewardship and ensures the health and wellbeing of its citizens. To that end, the purpose of this supply chain analysis is to identify high-impact County purchase types in order to prioritize strategies that offer the greatest reduction opportunities.

Supply Chain Expenditures

Payments made by the County to a network of suppliers that produce goods and services purchased by Alameda County for operational needs to and provide community services. Production may take place locally or in other locations for final consumption in Alameda.

Life Cycle Assessment (LCA)

Total environmental impact of a product from extraction of raw materials through production and transport up to the point of County purchase. Impacts from use and disposal of products are not considered in this analysis but are included in the County's Operational Greenhouse Gas Inventory.

¹ For more information on Good Company visit www.goodcompany.com.

² U.S. Environmental Protection Agency's *United States Environmentally-Extended Input-Output (USEEIO)* data model² is the source of the impact factors used in this analysis. The model was accessed using openLCA (v1.6.3). USEEIO and openLCA are free, publicly available resource, as are all the resources and tools used in this analysis.



Countywide Results

During fiscal year 2015, the County’s expenditures (included in the analysis) were \$870 million in 192 purchasing categories from over 2,000 vendors.

These expenditures result in the following impacts (and equivalents):

- **Greenhouse Gases – 175,000 MT CO₂e (annual energy use by 30,000 homes)**
- **Particulate Matter – 138,000 kg PM_{2.5} (683 million miles driven by a freight truck)**
- **Water Use – 2.9 billion gallons (annual water used by 25,000 homes)**

For scale, Alameda County’s 2015 greenhouse gas emissions inventory for government operations estimates emission from its owned buildings, vehicles, employee commutes and waste generation to totaled about 49,400 MT CO₂e. While the County has less direct control over emissions occurring in the supply chain than it does its own operations, the scale of opportunity to create positive change is significant.

RESULTS BY PURCHASING CATEGORY

Across the impact metrics included in this report, two purchasing categories represent between 60-80% of impacts. Figure ES-1 shows greenhouse gases generated, as a result of the County’s procurement, represented by purchasing category (e.g., professional services, construction). See Figure ES-3 for the results for all impact metrics.

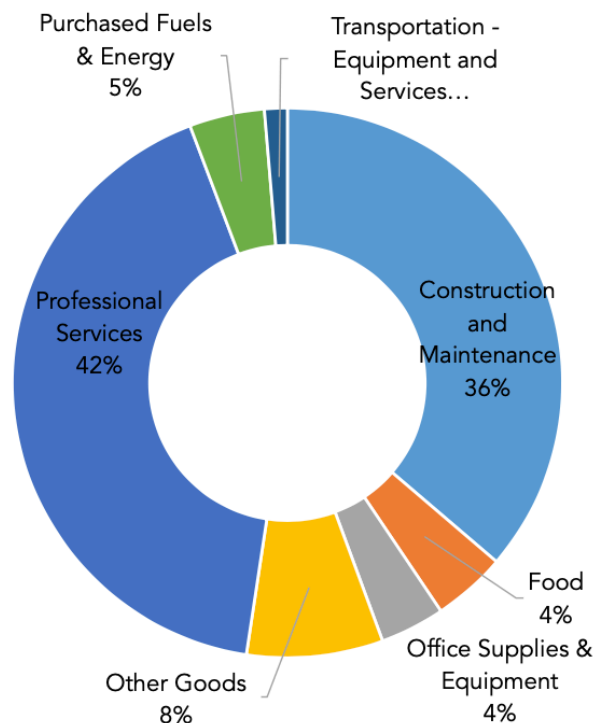
- **Professional Services**

Professional services accounts for 42% of the greenhouse gas emissions from the County’s supply chain expenditures. One subcategory, Community-directed Services, accounts for 90% of the GHGs from this purchasing category with the remainder occurring from business services provided to the County. Community-directed services are County sponsored community services for those in need, such as medical, dental, child care, and community food and housing. Impacts from these services occur directly from service providers’ buildings and equipment fuel and electricity use, as well as the impacts associated with the production of material goods they purchase in the course of providing the services.

- **Construction and Maintenance**

Construction and maintenance of County facilities and infrastructure accounts for 36% of the greenhouse gas emissions from the County’s supply chain expenditures. New construction accounts for approximately 90% of the GHG impact for construction and maintenance, with the remainder occurring from maintenance. Impacts from goods and services include the direct, local impacts from vehicle and equipment fuel combustion during construction, as well as the impacts associated with production of building materials.

Figure ES-1: Countywide 2015 supply chain greenhouse gases, by Purchasing Category.



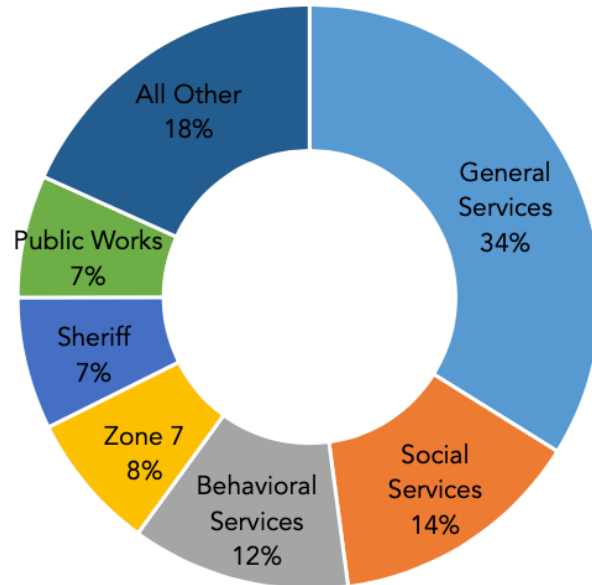
RESULTS BY COUNTY DEPARTMENT

Figure ES-2 provides Countywide GHG impacts, by Department (see ES-4 for all impacts). The following Departments represent the majority of impacts across all impact metrics:

- General Services Agency
- Social Services Agency
- Behavioral Health Care Services
- Sherriff's Department
- Public Works Agency
- Zone 7 Water Agency

General Services Agency's impacts are the result of expenditures for construction, electricity, natural gas, and vehicle fuels that are made on behalf of all County departments. Social Services Agency and Behavioral Health Care Services' impacts are the result of expenditures related to community directed social services and medical services, respectively, that are critical to the County's role as the community's social safety net.

Figure ES-2: Countywide 2015 supply chain greenhouse gases, by Department.



Reduction Opportunities for High-Impact Purchases

Based on the findings presented in the *Results* section, high-impact purchasing categories were selected by County staff for more detailed analysis. This deeper analysis uses details contained within the U.S. Environmental Protection Agency's *United States Environmentally-Extended Input-Output* (USEEIO) model to highlight specific activities that occur within the supply chain of the goods and services procured by the County that drive the bulk of the impacts and to identify those impacts that are generated locally (e.g., particulate matter emissions from local vendor fleet operations). The intent of this detailed analysis is to provide information and recommendations on available opportunities to work with County vendors to improve environmental performance and advance the health and wellbeing of the residents of Alameda County and beyond.

It is important to note that not all vendors will need to address all impact categories. Impacts vary depending on the type of business. It is also important to note that this analysis is based on average impacts for business types and does not account for activities already in place to minimize certain impact area (e.g. vendors that have already switched to low-carbon, nutritionally equivalent food products for meat and dairy). Therefore, the following suggested opportunities may not fit all vendors in the product or service category.

COMMUNITY-DIRECTED SERVICES

Alameda County provides a wide range of services to its community members through contracts with service providers in order to fulfill its critical role as a social safety net provider. Based on the types of services provided within Community-Directed Services, four vendor types were considered within the USEEIO model in order to approximate the typical types of vendor services provided through County funding – child care facilities, community food and housing services, hospitals, and offices of physicians and dentists. The supply chain activities that drive the majority of greenhouse gases, particulate matter, and water impacts are similar and include



– building energy use; vehicle fuel use; and the purchase of meat and dairy products. For human toxicity, the primary activities are the production and combustion of vehicle fuels and production of plastic products.

OPPORTUNITIES TO REDUCE IMPACTS – COMMUNITY-DIRECT SERVICES

- Purchase energy efficiency vehicles and equipment and implement conservation practices*
- Ensure facilities are supplied with renewable electricity from local power provider
- Electrify vendor-owned vehicles and building systems*
- Reduce the wasting of edible food (particularly meat and dairy products)*
- Substitute lower-impact, nutritionally equivalent foods for meat and dairy

**Actions reduce local emissions of particulate matter and smog formation*

FACILITY AND INFRASTRUCTURE CONSTRUCTION

Alameda County constructs and maintains facilities required for government business operations as well as public infrastructure (e.g. roads, bridges, flood control channels) to meet the public need. Within construction, three types of construction services were considered within the USEEIO model to approximate the typical types of vendor services provided through County funding – new commercial construction, road construction, and commercial maintenance. The supply chain activities that drive the majority of greenhouse gas and particulate matter impacts are similar and include: vehicle fuel production and combustion by construction and freight vehicles and equipment; and the production of cement and concrete products. For human toxicity, the primary activities are vehicle fuel production and combustion by construction and freight vehicles and equipment.

OPPORTUNITIES TO REDUCE IMPACTS – CONSTRUCTION

- Purchase energy efficiency vehicles and equipment and practice energy conservation*
- Specify electric heating and hot water systems in new construction and replacement
- Specify late model construction vehicles or after-market emission control devices*
- Specify use of low-GHG fuels certified under California Low Carbon Fuel Standard
- Specify low-impact concrete mixes and require Environmental Product Declarations
- Specify reclaimed asphalt content in asphalt concrete mixes and warm mix processing

FOOD SERVICES

Alameda County contracts with food service providers primarily in relation to the care and custody of individuals housed in the County's juvenile and adult correctional facilities. Within food services, two vendor types were considered within the USEEIO model to approximate the typical types of vendor services provided through County funding – food and drinking places and package meat products.

For food and drinking places, greenhouse gases are generated by the consumption of meat and dairy products and electricity use. Particulate matter impact is dominated by upstream emissions from oilseed farming and grain production. Water use is dominated by grains production followed by electricity generation. Human toxicity is dominated by the production and combustion of vehicle fuels used in truck freight.

OPPORTUNITIES TO REDUCE IMPACTS – FOOD SERVICES

- Purchase energy efficiency vehicles and equipment and practice fuel conservation*
- Reduce the wasting of edible food (particularly meat and dairy products)*
- Participate in utility-sponsored renewable electricity programs
- Substitute lower-impact, nutritionally equivalent foods for meat and dairy
- Explore opportunities to specify the sourcing of meat products from facilities that operate using best manure management practices

Conclusions

Production of goods and services purchased by Alameda County result in over three times the greenhouse gas emissions measured in the County's government operations inventory. The large scale of the County's supply chain impacts presents an opportunity for reductions that can improve the community's health and wellbeing.

The County has already made strides towards reducing supply chain impacts through its installation of solar PV systems and utility purchase of renewable energy, actively transitioning the County fleet to electric vehicles, LEED certification and energy efficiency in public buildings. The County is committed to continue finding the most effective programming to further reduce its impact. To that end - Good Company conducted this analysis to assess the estimated impacts of County purchasing to prioritize opportunities for future programmatic focus areas. The analysis highlights significant opportunities in the County's purchasing, particularly construction and community-directed services, and provides information the County may use in partnership with vendors to reduce impacts to benefit the community.

Figure ES-3: Percentage of greenhouse gases, particulate matter, and water use impacts by purchasing categories (%).

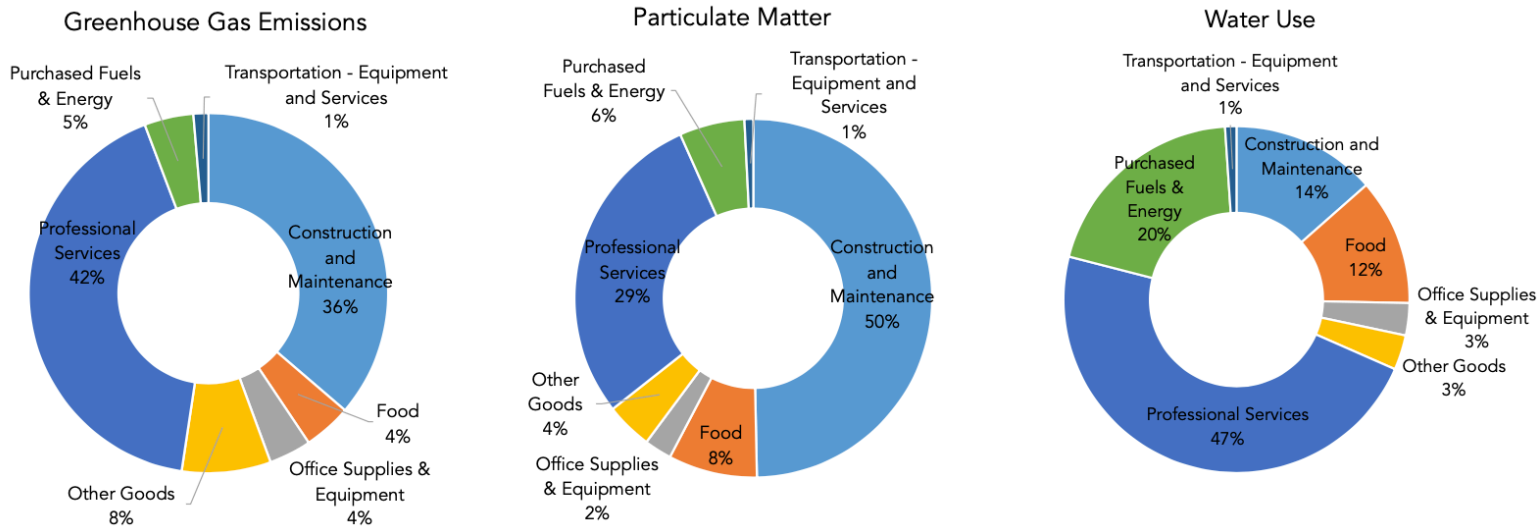


Table ES-1: Details for Purchasing Sub-Categories for impacts. Red equal greater impact and Green means less impact.

Results Groupings - Subgroupings	Global Climate Change		Human Respiratory		Water Use		Human Toxicity		Smog Formation		Acid Rain	
	kg CO2e	%	kg PM2.5e	%	m3	%	CTUh	%	kg O3e	%	kg SO2e	%
Construction and Maintenance - New Construction	56,423,864	32%	59,990	43%	1,276,871	12%	0.0923	33%	4,211,656	38%	151,206	24%
Construction and Maintenance - Maintenance	7,281,576	4%	8,835	6%	191,325	2%	0.0106	4%	370,565	3%	16,098	3%
Food	7,584,417	4%	11,140	8%	1,282,039	12%	0.0096	3%	322,528	3%	48,517	8%
Office Supplies & Equipment - Furniture	915,218	1%	611	0%	53,678	0%	0.0031	1%	72,918	1%	2,754	0%
Office Supplies & Equipment - IT Equipment	2,592,088	1%	1,125	1%	121,574	1%	0.0037	1%	149,663	1%	7,648	1%
Office Supplies & Equipment - Supplies & Printing	3,161,462	2%	1,694	1%	150,792	1%	0.0067	2%	203,783	2%	10,837	2%
Other Goods - Administrative (water purchased included)	13,485,823	8%	5,513	4%	317,517	3%	0.0157	6%	511,044	5%	38,455	6%
Other Goods - Health Care	592,098	0%	329	0%	35,697	0%	0.0010	0%	34,190	0%	1,880	0%
Professional Services - Business Services	7,198,562	4%	3,098	2%	335,849	3%	0.0113	4%	446,501	4%	21,957	4%
Professional Services - Community-Directed Services	66,318,775	38%	36,941	27%	4,814,414	44%	0.0985	35%	3,508,808	31%	221,238	36%
Purchased Fuels Energy - Electricity	3,166,390	2%	7,187	5%	2,044,372	19%	0.0087	3%	762,000	7%	80,859	13%
Purchased Fuels Energy - Natural Gas	2,122,023	1%	371	0%	80,555	1%	0.0041	1%	93,025	1%	4,767	1%
Purchased Fuels Energy - Transport Fuels	2,479,293	1%	615	0%	42,036	0%	0.0139	5%	319,786	3%	8,157	1%
Transportation - Business Travel	11,119	0%	5	0%	350	0%	0.0000	0%	1,282	0%	39	0%
Transportation - Vehicles and Equipment	2,342,548	1%	1,094	1%	114,707	1%	0.0034	1%	148,867	1%	6,648	1%
Grand Total	175,675,256	100%	138,548	100%	10,861,777	100%	0.2827	100%	11,156,615	100%	621,060	100%

Figure ES-4: Percentage of greenhouse gases, particulate matter, and water use impacts by Department (%).

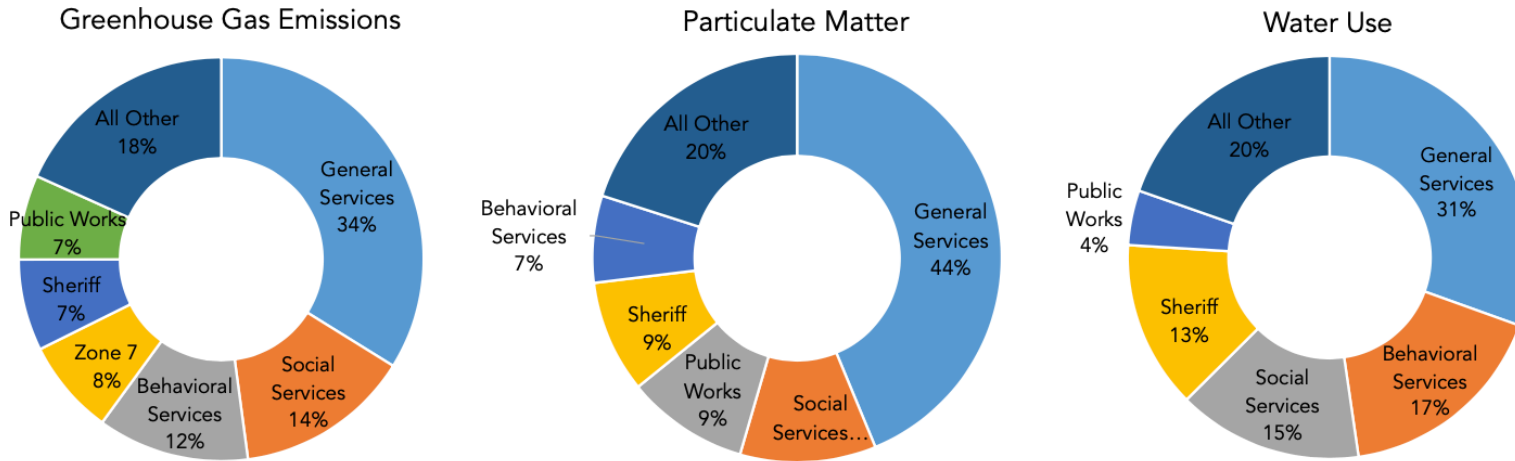


Table ES-2: Top 20 County Departments. Red equal greater impact and Green means less impact.

Department	Global Climate	Dept.	Human Respiratory	Dept.	Water Use	Dept.	Human	Dept.	Smog Formation	Dept.	Acid Rain	Department Legend	
	kg CO2e %		kg PM2.5e %		m3 %		CTUh %		kg O3e %		kg SO2e %		
GENSA	59,474,380 33.9%	GENSA	60,625 43.8%	GENSA	3,311,887 30.5%	GENSA	0.109 38.7%	GENSA	4,876,405 43.7%	GENSA	228,347 36.8%	ACOFO	Alameda County Fire Department
SOCSA	24,652,748 14.0%	SOCSA	14,886 10.7%	BHSVC	1,869,162 17.2%	SOCSA	0.037 13.2%	SOCSA	1,276,905 11.4%	SOCSA	100,398 16.2%	ASESR	Assessor's Office
BHSVC	21,298,907 12.1%	PBWKS	13,374 9.7%	SOCSA	1,610,577 14.8%	BHSVC	0.032 11.5%	BHSVC	1,122,558 10.1%	BHSVC	59,318 9.6%	AUDTR	Auditor Controller Agency
ZONE7	13,421,828 7.6%	SHERF	12,343 8.9%	SHERF	1,461,250 13.5%	PBWKS	0.019 6.7%	PBWKS	837,757 7.5%	SHERF	58,101 9.4%	BHSVC	Behavioral Health Services
SHERF	12,859,569 7.3%	BHSVC	9,527 6.9%	PBWKS	476,645 4.4%	SHERF	0.019 6.7%	SHERF	642,761 5.8%	ZONE7	37,227 6.0%	BOARD	Board of Supervisors
PBWKS	11,902,439 6.8%	ZONE7	6,431 4.6%	HCSVC	463,114 4.3%	ZONE7	0.016 5.6%	ZONE7	565,356 5.1%	PBWKS	36,138 5.8%	CAOFF	County Administrator
HCSVC	8,703,767 5.0%	CMDEV	5,896 4.3%	CMDEV	335,875 3.1%	HCSVC	0.013 4.6%	HCSVC	524,549 4.7%	HCSVC	24,071 3.9%	CMDEV	Community Development Agency
CMDEV	5,855,197 3.3%	HCSVC	4,406 3.2%	PROBT	300,975 2.8%	CMDEV	0.009 3.1%	CMDEV	327,303 2.9%	CMDEV	22,874 3.7%	COLIB	County Libraries
PHSVC	3,310,042 1.9%	PROBT	2,583 1.9%	ZONE7	265,054 2.4%	PHSVC	0.006 1.9%	PHSVC	203,711 1.8%	PROBT	12,684 2.0%	CONSL	County Counsel
PROBT	2,789,807 1.6%	PHSVC	1,870 1.3%	PHSVC	216,017 2.0%	ACOFO	0.004 1.6%	ACOFO	155,471 1.4%	PHSVC	10,068 1.6%	CSSVC	Child Support Services
ACOFO	2,461,402 1.4%	EHSVC	1,621 1.2%	ACOFO	129,849 1.2%	PROBT	0.004 1.4%	PROBT	134,909 1.2%	ACOFO	7,243 1.2%	DAOFF	District Attorney's Office
CAOFF	2,240,643 1.3%	ACOFO	1,390 1.0%	CAOFF	119,156 1.1%	CAOFF	0.003 1.2%	CAOFF	127,394 1.1%	CAOFF	6,495 1.0%	EHSVC	Environmental Health Services
ITDPT	1,922,025 1.1%	CAOFF	1,138 0.8%	ITDPT	93,052 0.9%	ITDPT	0.003 1.0%	ITDPT	110,736 1.0%	ITDPT	5,779 0.9%	GENSA	General Services Agency
EHSVC	1,588,832 0.9%	ITDPT	863 0.6%	ALCTY	68,213 0.6%	EHSVC	0.002 0.7%	EHSVC	55,255 0.5%	EHSVC	2,590 0.4%	HCSVC	Health Care Administration
ALCTY	770,512 0.4%	ALCTY	340 0.2%	COLIB	27,068 0.2%	ALCTY	0.001 0.4%	ALCTY	40,557 0.4%	ALCTY	2,128 0.3%	HR SVC	Human Resource Services
COLIB	602,612 0.3%	COLIB	294 0.2%	EHSVC	22,209 0.2%	COLIB	0.001 0.4%	COLIB	40,113 0.4%	COLIB	1,835 0.3%	ITDPT	Information Technology Dept.
DAOFF	400,307 0.2%	DAOFF	211 0.2%	HR SVC	20,988 0.2%	DAOFF	0.001 0.3%	AUDTR	27,724 0.2%	DAOFF	1,247 0.2%	LAWLB	Law Library
HR SVC	321,649 0.2%	HR SVC	211 0.2%	DAOFF	19,220 0.2%	AUDTR	0.001 0.2%	DAOFF	25,334 0.2%	AUDTR	1,099 0.2%	PBWKS	Public Works Agency
AUDTR	315,420 0.2%	AUDTR	142 0.1%	AUDTR	12,251 0.1%	HR SVC	0.000 0.2%	HR SVC	17,767 0.2%	HR SVC	1,070 0.2%	PDOFF	Public Defender's Office
ROVTR	225,614 0.1%	ROVTR	108 0.1%	ROVTR	11,552 0.1%	ROVTR	0.000 0.1%	ROVTR	11,604 0.1%	ROVTR	644 0.1%	PHSVC	Public Health Services
TTAXC	133,512 0.1%	TTAXC	64 0.0%	TTAXC	6,612 0.1%	TTAXC	0.000 0.1%	TTAXC	7,477 0.1%	TTAXC	404 0.1%	PROBT	Probation Department
CSSVC	105,902 0.1%	CSSVC	53 0.0%	PDOFF	5,254 0.0%	CSSVC	0.000 0.1%	CSSVC	6,808 0.1%	CSSVC	331 0.1%	ROVTR	Registrar of Voters
PDOFF	100,191 0.1%	PDOFF	50 0.0%	CSSVC	4,996 0.0%	PDOFF	0.000 0.1%	PDOFF	5,701 0.1%	PDOFF	315 0.1%	SHERF	Sheriff's Department
ASESR	84,661 0.0%	BOARD	47 0.0%	ASESR	4,169 0.0%	ASESR	0.000 0.1%	ASESR	4,936 0.0%	ASESR	259 0.0%	SOCSA	Social Services Agency
BOARD	67,535 0.0%	ASESR	40 0.0%	CONSL	3,372 0.0%	CONSL	0.000 0.0%	CONSL	3,773 0.0%	CONSL	206 0.0%	TTAXC	Treasurer - Tax Collector
CONSL	65,755 0.0%	CONSL	33 0.0%	BOARD	3,263 0.0%	BOARD	0.000 0.0%	BOARD	3,751 0.0%	BOARD	190 0.0%	ZONE7	Zone 7 Water Agency
Top 5 Total	131,707,432 75%	110,756 80%	8,729,520 80%	0.217 77%	8,756,386 78%	483,390 78%							
Grand Total	175,675,256 100%	138,548 100%	10,861,777 100%	0.283 100%	11,156,615 100%	621,060 100%							