



MEMORANDUM

DATE: July 22, 2004
TO: Mike Webb, Economic Development Coordinator
FROM: Sherry Okun, Associate; Matt Kowta, Principal
RE: Davis Retail Leakage Update

Introduction

In addition to this introduction, this memo includes a summary of the results of a current leakage analysis for the City of Davis as well as a comparison to estimated leakage in 99/2000. This memo also includes a comparison between Davis and a number of other cities as well as the State of California overall, in terms of their historic and current per capita retail sales volumes. A more detailed description of the leakage analysis methodology follows these discussions. We have included as an appendix a copy of a leakage estimate table that we prepared for the City in 2000, using a different methodology. (See Appendix A, Table A-1.) The main objective of this leakage analysis is to identify the City's current retail strengths and weaknesses relative to past strengths and weaknesses, along with the overall trend in leakage, in order to understand where the community is headed and what opportunities might exist for the City of Davis to improve its retail performance in the future.

The Retail Leakage Concept. Given the demographic and economic make-up of Davis' residential base and the local business sectors, the City can expect local demand for a certain mix of goods and services. For goods not readily available within the City, or when greater selection and/or better prices are available elsewhere, residents will travel outside of the City to make purchases and satisfy at least a portion of their demand. When residents travel out of the City to shop, retail expenditures "leak" out of the City, that is merchants located outside the City capture expenditures that local residents, businesses, or employees might otherwise have made with local merchants. Conversely, when non-residents, businesses, or employees who are from outside of Davis make purchases within the City of Davis, this represents "injections" of retail sales. When we estimate mathematically that actual local sales are less than potential demand, we consider this leakage and when we estimate that actual local sales are greater than potential demand, we consider this injection.

Although one might expect a City to have a goal of zero leakage, that is not always the case. Most small communities will have some leakage because they are not large enough to support the requisite selection of goods that will entice local sources of demand (residents, businesses, employees) to make all of their purchases locally. With our society's mobility,

it is natural for local residents to make some purchases outside of the local area, such as when they are traveling out of the area, working elsewhere in the region, or simply venturing out of the city to shop for a change of pace. Many communities that do achieve retail injections do so as a result of a concerted effort to develop disproportionately large quantities of retail space, capitalizing on such factors as good regional access and visibility, lack of competitive retail facilities in other nearby communities, and a local land use policy that favors large-scale retail development. As will be evident later in this memo, Roseville is a good example of a community with this type of retail development focus. Because retail expenditures are a zero sum game, for every community that has injections of retail sales, there must be another community or group of communities that have leakage equal to the injection. Given the City of Davis' primarily neighborhood and community-serving retail base, and a relative lack of regional retail attractions other than the auto center, Davis should not expect significant injections in the non-auto retail categories.

Leakage Analysis Summary

The purpose of the leakage analysis is to provide an estimate of the amount of retail expenditures leaking out of Davis as of 2003, using the IMPLAN modeling method described in the methodology section at the end of this memo, along with a comparison to the amount leaking out of Davis in 2000.

Leakage Estimates for 1999/2000 and 2003. BAE compiled modeling inputs in order to estimate Davis' leakage as of the 5/1999 through 4/2000 time period¹ and to compare that to leakage estimated for the 2003 calendar year. After factoring in the local household population and its income distribution along with the size and sectoral composition of the local non-residential economic base, we estimate that overall in 2003, Davis was actually capturing retail expenditure injections of about 16 percent. In other words, actual local retail sales exceeded our expected local retail sales amount by 16 percent, or approximately \$65 million. Using this same methodology, but using the inputs for the conditions in 1999 yielded an estimated injection of six percent, or \$17 million.

Table 1 shows the estimated leakage for Davis in 1999/2000. Setting aside the effect of Davis auto sales on the overall leakage calculation, Davis would have had a 14 percent overall leakage. Major areas of leakage included Apparel, General Merchandise, Home Furnishings and Appliances, and Building Materials and Farm Implements. This is due to the relative scarcity of stores serving these needs within Davis.

As Table 2 illustrates, Davis had a 16 percent overall injection of sales as of 2003. This is due to the 121 percent injection of sales in the Auto Dealers, Auto Supplies and Service Stations category. Without considering the auto sector, Davis leakage would have been approximately 16 percent. Davis continues to have major leakages in Apparel, General

¹ This earlier time period is used because this is the 12-month period that BAE analyzed for the City in 2000, in conjunction with a downtown retail recruiting study.

Merchandise, Home Furnishings and Appliances, and Building Materials and Farm Implements. Although the City has attracted some new retailers in some of these categories, apparently local sales have not increased substantially relative to the increase in population and spending power in these categories since 1999/2000, causing a slight increase in the total volume of expenditures leaking out of Davis if we exclude the effect of the auto sector's strong performance.

Comparing Table 2 with Table 1, we estimate that since 1999/2000, the significant changes in Davis' retail performance include: a 13 percentage point increase in leakage in apparel; a 14 percentage point reduction in food stores injections; a 30 percentage point reduction in eating and drinking establishments injections; an eight percent increase in the leakage in the building materials and farm implements category; a 25 percent increase in the auto stores category's injection; and a six percentage point reduction in the injection of sales into the specialty retail category.

Davis Taxable Retail Sales Compared to Other Communities

From the preceding discussions, it should be evident that local retail sales are influenced by a number of factors including the demographics of the local population base as well as the composition of the local economy. Therefore, Davis' local sales tax revenues cannot be directly compared to other communities in terms of performance. At the same time, these types of general comparisons are useful to compare the discretionary resources a given set of communities generates from sales taxes they can use to fund various public services. Along with property taxes, and motor vehicle in-lieu fees, sales taxes are typically among the most important discretionary revenues for local governments in California.

Although the per capita sales cannot be directly compared between cities, it is clear that per capita retail sales have increased markedly in the past three years. While Davis' per capita retail sales were only equal to 53 percent of the Statewide average in 1998, by 2002, Davis' per capita sales level was 80 percent of the statewide rate. Additionally, the City is increasing its sales per capita taxable sales relative to other cities in the region. In 1998, with approximately \$5,743 in sales per capita, Davis had the lowest amount of sales per capita in the region. In 2002, with \$6,862 in per capita sales, Davis now has higher per capita sales than Dixon. Roseville has the highest per capita sales in the region (\$29,739), due to the 1.1 million square foot Galleria Mall, the highly successful Roseville Auto Mall, and the other retail development that has proliferated along Highway 65 in the vicinity of the Galleria. Tables 3 and 4 show the total sales and per capita sales for Davis, several cities within the region, and the State of California, for 1998 and 2002² respectively.

² 2002 is used for these comparison tables because 2002 is the last full year for which the State Board of Equalization has reported retail sales in other communities.

Conclusions

The City has made some progress in increasing its capture of retail sales relative to the potential expenditures of the local pool of demand from both residents and from businesses to business transactions, as indicated by an increase in the overall injection amount; however, we credit this primarily to the strength of the auto sector. As noted above, leakage percentages increased in a number of other categories where leakage previously existed and the injection percentages in categories other than auto where there were injections in 1999/2000 have since fallen. Categories continuing to represent major opportunities to increase local sales capture include: Apparel Stores, General Merchandise Stores, Home Furnishings and Appliances, and Building Materials and Farm Implements. For the most part, other than in the auto category, local sales increases have not kept up relative to the increase in potential local demand. In those categories where leakage occurred in both 1999/2000 and in 2003, the leakage amount increased from about \$72 million to about \$88 million.

In regard to results of the leakage analysis, it should be noted that because the City requested both in 2000 and in 2003 that our estimates exclude the impact of UCD's influence on both the supply and demand side of the leakage equation, the leakages are most likely understated and the injections are most likely overstated, to some degree.

In spite of its estimated overall injection of retail sales, Davis continues to be a low performer relative to other nearby communities in terms of per capita retail sales. The most direct implication of this is the relative lack of local sales tax revenue that the City of Davis has available to help fund local public services.

Table 1: Estimated 5/99-4/2000 Davis Retail Sales Leakage Using IMPLAN Adjustment Factors

Retail Group	1999 California Per Capita Sales	Davis as a Percentage of CA (a)	1999 Expected Total Davis Sales (b)	5/99-4/2000 Reported Davis Sales	Estimated Annual Davis Injection or (Leakage)	Injection or Leakage as Pct. Of Expected
Apparel Stores	\$336	44.11%	\$8,951,222	\$6,321,618	(\$2,629,604)	-29%
General merchandise stores	\$1,249	91.84%	\$69,188,075	\$21,013,494	(\$48,174,581)	-70%
Food stores	\$504	102.24%	\$31,120,080	\$37,331,973	\$6,211,893	20%
Eating and drinking places	\$953	62.55%	\$35,976,092	\$52,305,356	\$16,329,264	45%
Home furnishings and appliances	\$352	73.77%	\$15,651,628	\$2,160,576	(\$13,491,052)	-86%
Building materials and farm implements	\$585	65.21%	\$23,021,634	\$14,948,576	(\$8,073,058)	-35%
Auto dealers, auto supplies, and service stations	\$1,441	66.98%	\$58,229,321	\$114,089,612	\$55,860,291	96%
Other Retail Stores	\$1,199	59.14%	\$42,787,684	\$53,882,037	\$11,094,353	26%
Retail Stores Total	\$6,619	62.04%	\$284,925,737	\$302,053,242	\$17,127,505	6%

Table 2: Estimated 2003 Davis Retail Sales Leakage Using IMPLAN Adjustment Factors

Retail Group	2003 California Per Capita Sales (c)	Davis as a Percentage of CA (a)	2003 Expected Total Davis Sales (b)	1/03-12/03 Reported Davis Sales	Estimated Annual Davis Injection or (Leakage)	Injection or Leakage as Pct. Of Expected
Apparel Stores	\$405	51.23%	\$14,207,230	\$8,199,448	(\$6,007,782)	-42%
General merchandise stores	\$1,302	85.93%	\$76,538,020	\$25,366,049	(\$51,171,971)	-67%
Food stores	\$601	88.15%	\$36,217,156	\$38,419,211	\$2,202,055	6%
Eating and drinking places	\$768	108.66%	\$57,091,914	\$65,584,859	\$8,492,945	15%
Home furnishings and appliances	\$405	70.13%	\$19,425,430	\$2,971,470	(\$16,453,960)	-85%
Building materials and farm implements	\$748	67.90%	\$34,755,790	\$19,948,586	(\$14,807,204)	-43%
Auto dealers, auto supplies, and service stations	\$2,568	61.38%	\$107,823,977	\$238,797,572	\$130,973,595	121%
Other Retail Stores	\$1,486	56.17%	\$57,117,213	\$68,447,033	\$11,329,820	20%
Retail Stores Total	\$8,283	65.58%	\$403,176,728	\$467,734,228	\$64,557,500	16%

Notes:

(a) See text for discussion of methodology to derive per capita adjustment factors.

(b) This is the product of CA per capita demand, times the Davis adjustment factor, times the Davis population.

(c) State of California, for 3rd Qtr. 2002 through 2nd Qtr. 2003. This is used as a proxy for 2003 sales.

Sources: Urban Land Institute, Dollars and Cents of Shopping Centers, 2002, California State Board of Equalization, 2004; Bay Area Economics, 2004

Table 3: Comparison of Retail Sales Per Capita, 1998

Community	1998 Taxable Retail Sales	1998 Population	Sales per Capita	1% Local Share
Davis (a)	\$312,594,000	54,428	\$5,743	\$57
Dixon	\$129,248,000	14,380	\$8,988	\$90
Fairfield	\$1,013,402,000	91,193	\$11,113	\$111
Folsom	\$610,665,000	45,008	\$13,568	\$136
Roseville	\$1,659,616,000	67,338	\$24,646	\$246
Sacramento	\$4,114,124,000	402,866	\$10,212	\$102
Vacaville	\$729,777,000	87,366	\$8,353	\$84
Vallejo	\$755,398,000	110,967	\$6,807	\$68
W. Sacramento	\$687,070,000	30,206	\$22,746	\$227
Woodland	\$501,111,000	44,456	\$11,272	\$113
California	\$358,858,378,000	33,225,655	\$10,801	\$108

Table 4: Comparison of Retail Sales Per Capita, 2002

Community	2002 Taxable Retail Sales	2002 Population	Sales per Capita	1% Local Share
Davis (b)	\$433,707,000	63,200	\$6,862	\$69
Dixon	\$106,981,000	16,200	\$6,604	\$66
Fairfield	\$1,223,410,000	100,700	\$12,149	\$121
Folsom	\$1,197,104,000	60,800	\$19,689	\$197
Roseville	\$2,614,068,000	87,900	\$29,739	\$297
Sacramento	\$3,379,766,000	425,000	\$7,952	\$80
Vacaville	\$921,373,000	92,600	\$9,950	\$100
Vallejo	\$908,447,000	119,500	\$7,602	\$76
W. Sacramento	\$332,141,000	34,650	\$9,586	\$96
Woodland	\$468,596,000	51,300	\$9,134	\$91
California	\$301,612,306,000	35,049,000	\$8,605	\$86

Notes:

- (a) Davis 1998 population reflects only the incorporated City.
- (b) Davis 2002 population reflects only the incorporated City.

Sources: California State Board of Equalization, 2004; California Department of Finance, 2004; Bay Area Economics, 2004

Leakage Model Methodology

Following is a description of the methodology used to estimate the local retail sales leakage, based on an estimate of the potential local retail demand derived from the IMPLAN input/output model. In order to understand changes in retail sales leakage over time, BAE generated leakage estimates for both 1999 and 2003, as shown in Tables 1 and 2, respectively. This allowed us to compare changes in sales performance over time for each local retail sector.

Leakage Methodology Overview. For this analysis, BAE utilized the IMPLAN input-output model to estimate the retail expenditure potential for Davis in both 1999/2000 and 2003 and to then compare these expected expenditures to the actual amount of retail sales reported for establishments within the City of Davis. Mathematically, we subtract expected expenditures from actual sales, and if the result is positive, we deem this an injection. If the result is negative, we deem this leakage.

BAE utilized a five-step method to estimate the expected retail sales for Davis using the IMPLAN input-output model, which incorporates consumer expenditure data from the Bureau of Labor Statistics' consumer expenditure survey. Unlike the method used in the 1999/2000 study, which estimated retail sales potential strictly on the basis of local population, the methodology using the IMPLAN model also accounts for the prevalence of business activity within the local area, which also generates demand for retail goods in the local economy. In brief, BAE first estimated the average per capita retail expenditure potential for California residents overall, considering the number of households within the state and their income distribution and considering the business activity within the state, as measured by the number of employees by sector. Then, BAE estimated the average per capita expenditure potential of Davis residents, based on the Davis household income distribution and data concerning the Davis employment base. For both the California and Davis per capita estimates, potential expenditures were broken out across various retail categories. Then, BAE compared the Davis per capita expenditure potential for each retail category to the per capita expenditure potential for California in order to generate a series of adjustment factors. For example, if we calculated the California per capita expenditure potential for a certain sector at \$1,000 per year and the Davis per capita expenditure potential for the same sector at \$1,100 per year, then the adjustment factor for Davis would be 1.1. Overall, the results of the IMPLAN analysis indicate that we can expect the per capita Davis retail expenditure rate to be approximately 70 percent of the California per capita expenditure rate. The final step in this methodology is to apply the Davis adjustment factors to the current California per capital sales figures, in order to estimate the potential retail expenditures for Davis residents, and then multiply these figures by the local population in order to estimate total potential local retail demand.

Statewide Per Capita Sales. BAE obtained the most current retail sales tax data available for the State of California (3rd Quarter of 2002 through 2nd Quarter of 2003). BAE divided statewide retail sales by category by statewide population to calculate statewide per capita

retail sales, to use as a starting point to estimate potential per capita retail expenditures for Davis residents.

IMPLAN Per Capita Expenditure Adjustment Factors. Using the IMPLAN³ model, BAE generated a comparison between the per capita expenditures that could be expected with Davis' actual household and business base as compared to if Davis household income distribution and employment distribution mirrored the State of California overall. This generated a series of expenditure adjustment factors (one for each retail category) that BAE then applied to the Current statewide per capita retail sales figures in order to estimate the potential Davis per capita sales.

Local Population and Other Factors Driving Retail Expenditures. BAE collected data on the Davis population, household income distribution, and employment base, to use in determining the potential retail expenditures associated with the local population and employment base. Additionally, although not utilized in the formal analysis, BAE collected information about the number of students living on campus, as well as the UC Davis employment base, which contribute additional retail expenditure potential beyond that of the population and employment located within the City of Davis proper.

BAE utilized the Census Bureau's 2000 Census Public Use Microdata files along with data from Claritas, Inc. to estimate the population and household income distribution for the City of Davis, and adjacent unincorporated areas. Using census tract data, BAE estimates that in 2003, there were approximately 68,412 residents living in the Davis area, including El Macero and other residential developments on county lands, excluding UC Davis. The median household income for these households was approximately \$48,212. Additionally, during the 2001-2002 school year, there were approximately 5,800 UC Davis students living on campus⁴. Although these students contribute to the local economy insofar as they purchase goods off-campus in the Davis community, BAE has excluded these students in the resident population figure used in this analysis.

In addition to the resident base, Davis has an employment base of approximately 14,800 workers. According to the California Employment Development Department (EDD), most of these employees work in the accommodation and food service sectors, followed by the healthcare and social assistance sector, and the retail trade sector. In this analysis, the

³ IMPLAN is a computerized input/output model that can be used to estimate the amount of economic activity within a local economy that some sort of local economic "event" creates. IMPLAN uses specific inter-industry relationships and accounts for the effect of local businesses on retail demand, in addition to the effects of local household expenditures. We believe that it gives a more fine-tuned estimate of local retail expenditure potential, which then helps to provide a more realistic estimate of the magnitude of retail expenditure leakage as compared to methods which consider only the size of the local population base.

⁴ UC Davis 2003 Long Range Development Plan, Final Environmental Impact Report. Table 4.11-6, Page 4.11-7.

government sector does not include UC Davis employees⁵; however, UC Davis and non-UC affiliated employment accounted for approximately 11,575 additional on-campus workers during the 2001-2002 school year⁶. Of these workers, approximately 50.8 percent of faculty and staff, or 5,334 UC employees, live in Davis⁷. Although UCD employees who reside in the City are not counted as employees in this analysis, they are included as residents, and therefore, BAE accounts for their retail demand. However, the remaining UC Davis workers are excluded from further analysis but, to the extent that they represent potential daytime shoppers, they contribute additional potential demand for local retail establishments.

Potential Davis Area Retail Expenditures. After estimating the benchmark average retail expenditures per capita in California, BAE then used the IMPLAN input-output model, taxable sales data, and demographics data collected for Davis and the State of California, to estimate the likely average retail expenditures per capita in Davis. Using these per capita expenditure estimates, BAE created adjustment factors to apply to the Statewide per-capita retail sales figures, by category, to estimate the anticipated total taxable retail expenditure potential of Davis residents, including those living in the adjacent unincorporated residential areas.

Current Local Retail Sales Data. To compare to the estimated expenditure potential, the City furnished BAE with State Board of Equalization (SBOE) data regarding local retail sales, by category. Davis collected approximately \$4.7 million in sales taxes in 2003 for retail sales transacted within the City. Since the City's share of sales tax is equal to approximately one percent of all taxable retail sales within the City, this translates into approximately \$470 million in total taxable sales.

In addition, BAE collected data from UCD regarding the quantity of retail sales occurring on campus, including campus dining establishments, the ASUCD bookstore, the Bike Barn, and other retail operations. UC Davis estimates approximately \$35.2 million in on-campus retail sales in fiscal year, 2002-2003. Of this, bookstore sales accounted for approximately \$25 million, food sales in the Memorial Union accounted for about \$6.3 million, and sales in the ASCUD Coffee House, Aggie Store, and the Bike Barn made up the remaining \$3.9 million. Although the remaining analysis focuses on retail sales within the City of Davis, excluding UC Davis sales, it is important to keep these additional sales on the UCD campus in mind when considering whether there are opportunities for the City to capture additional sales that may appear to be leaking out of the City.

⁵ Additionally, the government sector in 2003 differs from the government sector in 2000. EDD provides SIC data for all periods prior to 2000. In this analysis, the 1999 government sector does not include any state or federal agencies, including the post office. However, in 2003, the government sector does account for non-local government agencies.

⁶ UC Davis Long Range Development Plan, 2003-2005. Page 5.

⁷ UC Davis 2003 Long Range Development Plan, Final Environmental Impact Report. Table 4.11-2, Page 4.11-2.

Potential Davis Area Retail Expenditures Compared to Actual Davis Retail Sales. The final step of the leakage analysis involved comparing the actual retail sales reported within the City to the potential expenditures estimated using the IMPLAN-based methodology.

Appendix A: Results of 1999/2000 Leakage Analysis Using Alternate Methodology

As mentioned in the Leakage Analysis Summary section of this memo, BAE prepared a leakage analysis for the City of Davis in 2000, based on sales data for the period of 5/1999 through 4/2000. BAE conducted this analysis in conjunction with a downtown retail recruiting study, using a different methodology. This methodology was based on multivariate regression analysis of retail sales in each of the California counties, considering the effect of a number of demographic and economic factors. We have since developed the IMPLAN-based methodology to better account for the effects of the local business sector on local retail sales (i.e., business to business sales). Table A-1 is provided to show the results of the earlier analysis.

Prior Leakage Analysis Results

As Table A-1 illustrates, at the time, BAE estimated Davis' overall leakage amount at \$167.7 million, or 34 percent of estimated total potential sales associated with the City's resident population. The retail sales category experiencing the greatest percentage of leakage (93 percent) was home furnishings and appliances, followed by a 73 percent leakage in general merchandise.

Common Themes and Differences in Results Generated From Two Methodologies

The 1999/2000 methodology and the IMPLAN-based methodology generate substantially different conclusions in terms of the overall magnitude of the local leakage situation in the 1999/2000 time period. However, it is not surprising that the IMPLAN methodology reduced the estimates of local expenditure potential (and thus, local leakage) because it factors in the City of Davis' relatively small local non-residential base and reduces local expenditure potential accordingly. At the same time, both methodologies arrive at similar conclusions regarding the categories in which retail leakages existed at that time, including Apparel, General Merchandise, Home Furnishings and Appliances, and Building Materials and Farm Implements, although the magnitude of these leakages varies from one methodology to the other. They estimated injections of similar magnitude in the Food Stores category. There were significant differences in the estimated leakage/injection for Eating and Drinking Places, the Auto Sector, and Other retail.

Table A-1: Estimated 5/99 through 4/2000 Davis Retail Sales Leakage Using 2000 Adjustment Factors

Retail Stores Categories	1999 California Per Capita Sales	Expected Davis Per Capita Sales	Expected Total Davis Sales (a)	5/99-4/2000 Reported Davis Sales (b)	Estimated Annual Davis Injection or (Leakage)	Leakage as Percent of Expected Sales
Apparel Stores	\$336	\$358	\$21,987,653	\$6,321,618	(\$15,666,035)	-71%
General Merchandise stores	\$1,249	\$1,249	\$76,614,160	\$21,013,494	(\$55,600,666)	-73%
Food Stores (Taxable Sales)	\$504	\$504	\$30,953,338	\$37,331,973	\$6,378,635	21%
Eating and Drinking Places	\$953	\$1,104	\$67,772,003	\$52,305,356	(\$15,466,647)	-23%
Home Furnish. & Appliances	\$352	\$533	\$32,720,445	\$2,160,576	(\$30,559,869)	-93%
Bldg. Material & Farm Equip.	\$585	\$554	\$33,975,692	\$14,948,576	(\$19,027,116)	-56%
Auto Dealers, Auto Supplies, and Service Stations	\$1,441	\$1,499	\$92,008,064	\$114,089,612	\$22,081,548	24%
Other Retail Stores	\$1,199	\$1,716	\$105,289,321	\$53,882,037	(\$51,407,284)	-49%
Retail Stores Total	\$6,619	\$8,114	\$497,925,547	\$330,222,946	(\$167,702,601)	-34%

Notes:

- (a) Expected demand does not include potential expenditures from approximately 3,800 UC Davis students living on-campus.
- (b) Figures do not include on-campus retail sales for books (\$8.4 million), computer shop (\$2.3 million), clothing/gifts (\$2.0 million), supplies/miscellaneous (\$2.3 million) and retail food sales (\$5.1 million).

Source: California State Board of Equalization; BAE, 1999.