



Lake Travis Economic Impact Report

Lake Travis Coalition | September 29, 2011



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EXECUTIVE SUMMARY

Travis County and the Lake Travis Economic Stakeholders Committee commissioned RCLCO to complete an economic and fiscal impact analysis of Lake Travis. The executive summary serves as an abridged version of the report and first highlights the goals and key conclusions of the study, then discusses the methodology, data sources, and key conclusions in greater detail. Additional detailed analyses, along with all related charts and graphs, are in the full project report.

Goals of the Study

The goal of the study is to quantify the economic impacts of low lake levels on Travis County and the Metro-Austin Region, and to understand and quantify, where possible, the implications of water quality degradation at Lake Travis. The Lake Travis Economic Study considers a Study Area that surrounds Lake Travis and is wholly contained within Travis County. The Study Area is bounded by Ranch Road 620 and Anderson Mill Road to the east, Highway 71 to the south, FM 1431 to the north, and the Travis County line to the west (the small portion of Lake Travis that extends into Burnet County was not included in this study due to its primarily rural and undeveloped nature).

Lake Travis is a defining part of the Austin region. Austin's economy, including the semiconductor industry and other major industries, is impacted by the lake and the role it plays in the management of the Colorado River. Without a consistently available supply of water, the Metro-Austin economy likely would not function in the way it does today, nor would it have grown to the size it is today. The focus of this study, however, is on the shorter-term incremental economic effects of past low lake water levels and potential water quality degradation. Longer-term economic effects associated with water shortages driven by persistently low lake levels, such as reduced population and economic growth in the region, are not comprehensively addressed, nor are impacts associated with complex legal and environmental issues related to downstream water management.

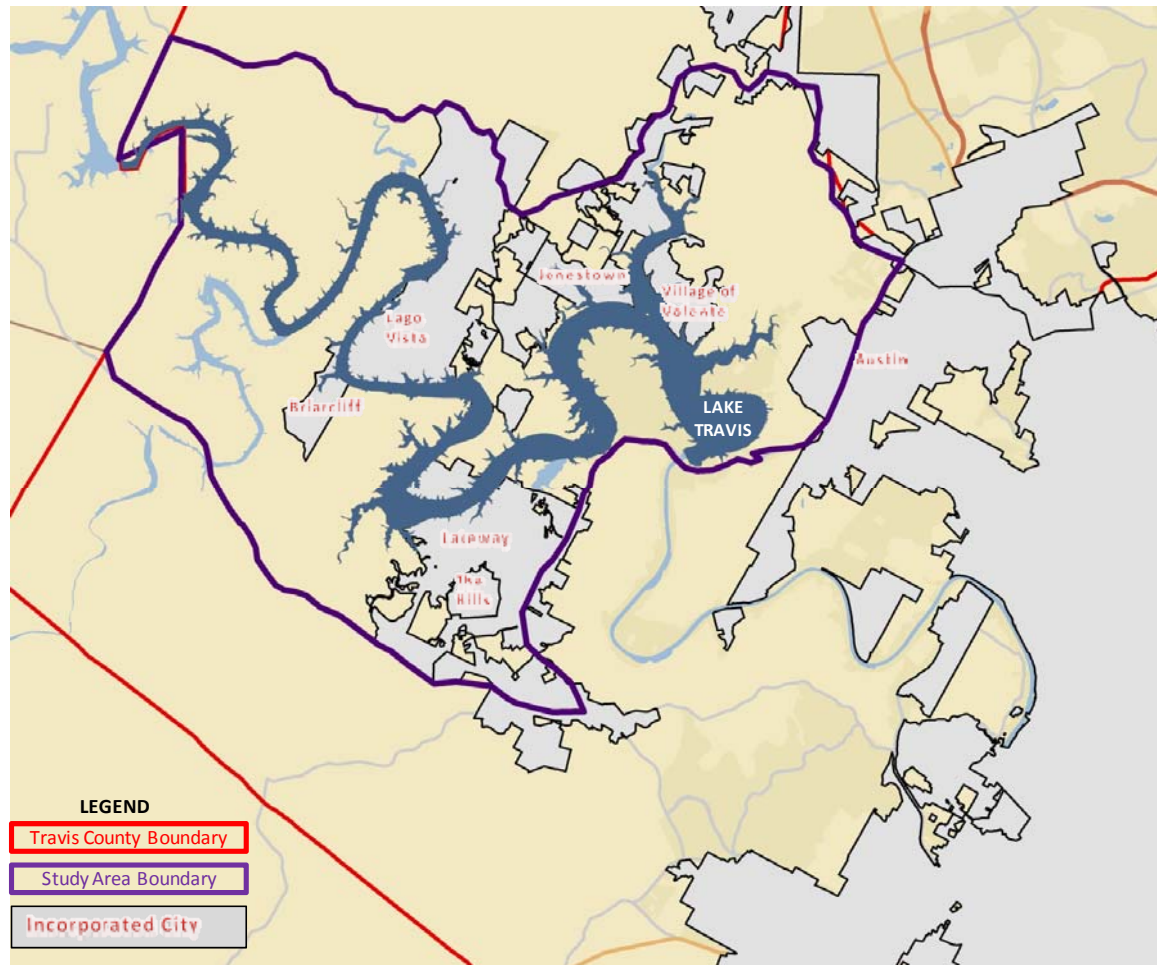
Specific goals of the Lake Travis Economic Study include the following:

- A.** Identify and quantify the streams of revenues (property tax, sales tax, and other sources of revenue) that accrue to Travis County, the cities surrounding Lake Travis, and the other governmental entities based on development and spending in the Study Area for the base year 2010. This is defined as the "base case fiscal impact."
- B.** Quantify the amount of spending driven by Lake Travis and provide an estimate for the total economic impact associated with lake-related spending for the base year 2010. Economic impacts include jobs created, associated wages, and total economic output. This is defined as the "**base case economic impact.**"

- C.** Determine the amount of **economic activity** supported by primary residence households and employees within the Study Area for the base year 2010.
- D.** Assess both the **fiscal and economic impacts of fluctuating lake levels**. Quantify the impact that low lake levels have on spending and jobs associated with the lake (economic impact) as well as on tax revenues to the County, local municipalities, and other taxing jurisdictions (fiscal impact).
- E.** Assess the potential **fiscal and economic impacts associated with diminished water quality** at Lake Travis.

The key conclusions for each of the above goals are summarized below.

Lake Travis Study Area



Key Conclusions

A. FISCAL IMPACT BASE CASE: Fiscal impacts in the Study Area in 2010 totaled **\$207.2 million in state and local revenues** in the form of property (\$158.4 million), sales (\$45.2 million), hotel occupancy (\$1.3 million), and mixed beverage taxes (\$2.3 million). Assessed property values in the Study Area totaled \$8.4 billion in 2010 according to the Travis Central Appraisal District.

- B. ECONOMIC IMPACT BASE CASE:** Lake Travis visitation was conservatively estimated at approximately **2.8 million visitor-days¹ in 2010**, generating visitor spending of \$168.8 million and boat sales of \$45.5 million. This spending created an **economic impact of 1,916 jobs, \$69.4 million in wages, and \$112.6 million in value added to the local economy**. Economic impacts are driven by direct spending or expenditures that would not occur but for the Lake, and include visitor spending, capital expenditures by boat owners and boat dock owners/renters, and boat sales.
- C. STUDY AREA ECONOMIC ACTIVITY BASE CASE:** Economic activity by Study Area primary households (defined as households that have their primary residence in the Study Area) and Study Area employees totaled **\$688 million and supported 5,200 jobs** in 2010.
- D. LAKE LEVEL IMPACTS: Below average, in-season water levels have been a recurring problem at Lake Travis.** Lake Travis experiences stable lake levels when water elevation is between 660 and 681 (full pool) feet above sea level. As lake levels begin to fall below 660 feet, visitation and recreation begin to decrease, but the lake still receives significant economic impacts from lake-related visitation. At lake levels below 650 feet, visitation sharply declines, driven by the closure of most of the lake's boat ramps as well as media attention which highlights safety and accessibility issues, perceived or real, at Lake Travis. As this occurs, visitor spending decreases and creates a significant negative impact on the local economy, as revenues at local hotels, restaurants, and other tourism-serving businesses fall. Finally, Lake Travis is an amenity to the residents of neighborhoods surrounding the lake, and extreme drops in water levels could also affect the property value and transaction pace of homes surrounding the lake. Key conclusions regarding the fiscal and economic impacts of low lake levels as well as the impacts on lake-dependent businesses and utilities are addressed below.
- 1. FISCAL IMPACTS:** Low lake levels in Lake Travis could have a significant impact on fiscal revenues. When lake levels are below 660' for 60 consecutive summer days, **fiscal revenues exclusive of property taxes drop between \$1.4 and \$1.9 million**. If low lake levels become persistent at Lake Travis, meaning they are not viewed as temporary but rather as the new normal, **property tax revenues could drop by \$15 million to \$20 million** which represents the premium Study Area properties enjoy by being on or in close proximity to Lake Travis. A **\$21.9 million drop in fiscal revenues represents a 10% decline from 2010**.
 - 2. ECONOMIC IMPACTS:** Increases or decreases in lake level elevation can decrease lake-related spending by 14 percent to 20 percent, resulting in **losses of up to 241 jobs, \$6.1 million in wages, and \$12.6 million in value on an annual basis**. **Stable lake levels**, defined as

¹ Tourism visitation is measured in visitor-days, which reflect the total number of days of tourist visits, not the total number of tourists.

elevations between 660' and 681' ("full pool") above sea level, **can increase visitation and spending by seven percent to 10 percent, resulting in an economic boost of up to 125 jobs, \$4.2 million in wages, and \$7.1 million in value annually.**

3. LAKE-DEPENDENT BUSINESSES AND UTILITIES: Lake Level fluctuations result in decreased demand for services provided by lake-related business and are the primary concern of Lake Travis business owners. The business operations of marinas, boat charter companies, scuba operators, and other water recreation companies are all directly affected by lake levels. Extreme drops in Lake Travis water levels force marina owners to move docks to deeper waters, or even close docks altogether. These lake-dependent businesses have maintained revenue streams by diversifying their operations, but this can only keep business viable if low lake levels are temporary. In addition, low lake levels can have negative impacts on some community and municipal water utilities. As lake levels drop, pumping and water treatment become more expensive, and the ability to generate electricity can even be compromised. At best, the expense to deliver potable water is increased with low water levels; at worst, utility providers could lose the ability to deliver potable water, resulting in significant impacts on the local communities. Please refer to the full report for detailed information provided by local businesses and utility providers.

E. WATER QUALITY IMPACTS: Recent studies and interviews suggest that the superior water quality at Lake Travis is an attraction for both visitors and businesses. Should water quality degrade, lake visitation and recreation will likely decline, costs for water treatment will increase for industries that depend on high water quality, costs for utility providers will increase, and property values may be negatively impacted, resulting in negative fiscal and economic impacts.

About Lake Travis

Lake Travis is a 19,000-acre lake with over 270 miles of shoreline located in Texas within Travis and Burnet Counties. Formed in 1937 with the creation of the Marshal Ford Dam, Lake Travis has been and continues to be an important force in the economic growth of the region. Lake Travis is the source of water and electricity for its surrounding communities, including but not limited to the municipalities of Briarcliff, Lakeway, Lago Vista, Jonestown, Point Venture, The Hills of Lakeway, Volente, and Austin (there are a total of 23 municipalities that rely on Lake Travis for water). The lake is a recreational destination for boaters and other water enthusiasts throughout the state, and is an important component of the region's tourism economy. Businesses of all sizes depend upon Lake Travis for their operations, including restaurants, hotels, boat rentals, golf courses, scuba operators, and real estate brokers and developers. Companies, including Samsung, AMD, and 3M, rely upon Lake Travis for their manufacturing operations as well. Finally, the lake is an amenity to the surrounding households. Since 1990, the size of the population living within 30 miles of Lake Travis has more than doubled to 1,537,585,

according to the U.S. Census. Resort communities such as Lakeway, Lago Vista, Jonestown, Point Venture, Briarcliff, and Village of the Hills were founded around Lake Travis in the 1960s and have grown to a total population of almost 22,000 as of 2010.

Lake Travis is a controlled-flow lake, with water coming in through rainfall and inflows from area creeks, rivers, and streams, and water going out to serve the demand of surrounding cities, water utilities, irrigation needs for the downstream industrial and agricultural users, and flows sufficient to maintain downstream estuary health. The lake is considered full at an elevation of 681.1 feet (“full pool”) above mean sea level (msl), and lake levels have fluctuated from a low of 614 feet in 1951 to a high of 710 feet in 1991. Drought, increased water use, downstream demands, and reduced inflows all cause water levels in Lake Travis to fall. Conversely, during flood events, businesses surrounding the lake may be forced to close for extended periods of time.

Methodology

The Lake Travis Economic Study begins with an assessment of the base case, which measures the fiscal and economic impacts associated with Lake Travis in 2010, which is both the most current year for which data are available and was an average lake-level year; therefore, the data are not skewed by extreme droughts or floods. The fiscal impact analysis estimates the current streams of revenues (property tax, sales tax, and other sources of revenue) that accrue to the State, County, and local jurisdictions as a result of development and spending on the lake. The economic impact analysis estimates lake-related spending and the total economic impact of that spending. The economic impact analysis quantifies the multiplier effect of spending on both jobs and total spending within Travis County and the region.

The lake level analysis considers economic and fiscal impact trends over time in order to determine the extent to which Lake Travis water levels impact the local economy as well as tax revenues. This analysis evaluates lake levels relative to valuations, transactions, spending, visitation, and other lake-related activities in the Study Area from 2006 to 2010. The goal of the analysis is to identify correlations between lake levels, economic impacts, and fiscal impacts, and to quantify the impacts of extreme fluctuations in water levels.

Between 2006 and 2010, population growth, commercial development, a national and local recession, and lake levels all contributed to changing household and consumer behaviors in the Study Area. This analysis isolates and solves for the effects of lake level fluctuations by comparing economic and fiscal impacts in the Study Area to control sets of data. Control data includes real estate trends surrounding neighboring Lake LBJ, visitation trends for other Central Texas lakes managed by the Army Corps of Engineers, and economic impact studies conducted for Lake Hartwell, located on the Georgia-South Carolina border, and Lake Lanier, located in Georgia. The analysis also isolates and evaluates the weighted contribution of the various macroeconomic, lake-related, and socio-economic factors that could have contributed to changes in economic and fiscal impacts.

The water quality analysis considers the economic and fiscal impacts that water quality degradation might have on the local economy. Water quality to date has been consistently good at Lake Travis, and with the exception of flood events that temporarily elevate pollutants in the lake, there is no historical record or data that demonstrates the impacts poor water quality has had on these industries. Nevertheless, RCLCO conducted interviews with lake-dependent businesses, evaluated previous studies regarding recreational users of Lake Travis, and analyzed case studies that considered persistent decline in water quality for other lakes.

Data sources

RCLCO would like to acknowledge the work and assistance of numerous state and local agencies in providing the following data that informed this analysis:

- Travis Central Appraisal District (TCAD) provided property tax assessments and payment due to each taxing entity for each parcel in the Study Area. TCAD also provided total property tax assessments for Travis County.
- The Texas Comptroller's office provided data for sales taxes, hotel occupancy taxes, and mixed beverage taxes.
- LCRA provided park visitation data and historical lake level data.
- Texas Parks & Wildlife Department provided boat registration data.
- Lake oriented business owners provided insight as to how lake levels affect business volume.
- Austin Central Realty Information Service

The majority of spending driven by Lake Travis is visitor spending, making the economic impact analysis for Lake Travis most akin to a tourism economic impact study. Tourism economic impact analyses typically rely on annual visitor counts and visitor surveys that quantify spending, length of stay, and party size. Such data was not available for Lake Travis, therefore RCLCO made a series of assumptions about visitation and spending that are detailed in the report.

RCLCO strongly recommends that a formal survey of visitors to Lake Travis be conducted in order to better understand the demographics of Lake Travis visitors and to know where visitors are coming from, party size, how long they stay, where they stay, how much they spend, what they buy, and what Lake Travis and regional tourism service providers can do to make the visitor experience more enjoyable and encourage longer and more frequent visits.

Key Findings

A. FISCAL IMPACT – BASE CASE

Key Conclusion: Fiscal impacts in the study Area totaled \$207.2 million in state and local revenues in the form of property (\$158.4 million), sales (\$45.2 million), hotel occupancy (\$1.3 million), and mixed beverage taxes (\$2.3 million). Property values in the Study Area totaled \$8.4 billion in 2010.

The Lake Travis Study Area is an important source of revenue for the 43 taxing entities that are located within the study area boundaries. The almost 38,000 parcels of land within the Study Area hold over 19,300 homes, 3,900 commercial businesses, six hotels, and 362 rental homes, with property values totaling \$8.4 billion. In total, the Study Area contributed over \$207.2 million to state and local revenues in 2010 through the collection of property, sales, hotel occupancy, and mixed beverage taxes. Over 70 percent of the tax revenues collected within the Study Area funded local taxing entities, which include municipalities, emergency service districts, school districts, utilities, and other special purpose districts. Property taxes make up over 80 percent of all tax collections in the Study Area and are the largest source of tax revenue for almost all of the taxing entities. Key findings from the fiscal impact analysis include:

- **Property Taxes** - The total assessed value of all taxable property in the study area in 2010 was \$8.4 billion, which reflects \$5.0 billion in improvement value and \$3.4 billion in land value. Owners of this property paid over \$158.4 million in property taxes to 43 taxing entities.
- **Home Value Premiums for Lake-related Properties** - Lake related residential properties² have an average land value per-acre of \$162,000, which reflects a 134 percent premium over other primary residential parcels in the Study Area. Lake-related parcels have an average improvement value per square foot of \$132, which represents a 38 percent premium over other primary residential properties in the Study Area.
- **Sales Taxes** - Businesses located within the Lake Travis Study Area and along Ranch Road 620 generated over \$45.2 million in sales tax revenues in 2010. Of this, approximately \$5.3 million in sales tax revenues were collected by the towns and cities within the Study Area.
- **Hotel Occupancy Taxes** - Study Area hotels and home rentals generated \$1.3 million in hotel occupancy tax in 2010.
- **Mixed Beverage Taxes** - In 2010, over 600 businesses in the Study Area collected revenues that were subject to the mixed beverage tax. Travis County collected \$245,200 in mixed beverage taxes, another \$245,200 was distributed among local entities, and the state of Texas collected \$1.80 million in mixed beverage taxes for a total of \$2.3 million.

²Travis County refers to properties as “parcels” which are defined as a plot of land and structures upon the land that are under single ownership.

Figure 1: Base Case Fiscal Impacts by Jurisdiction

	City of Austin	Village of Briarcliff	City of Jonestown	City of Lago Vista	City of Lakeway	Village of Point Venture	Village of the Hills	Village of Volente	Other Local Taxing Entity	Travis County	State of Texas	Total
Property Tax												
Residential	\$711,625	\$172,145	\$1,277,550	\$2,553,246	\$3,132,860	\$136,867	\$121,782	\$155,850	\$93,815,160	\$25,387,703		\$127,464,788
Commercial	\$149,409	\$2,748	\$27,252	\$164,544	\$243,959	\$515	\$5	\$6,693	\$5,663,884	\$1,672,721		\$7,931,730
Land	\$80,447	\$14,109	\$484,360	\$729,076	\$308,572	\$13,127	\$2,592	\$29,184	\$16,526,374	\$4,844,352		\$23,032,193
Total Property Tax	\$941,480	\$189,002	\$1,789,163	\$3,446,866	\$3,685,391	\$150,510	\$124,380	\$191,726	\$116,005,418	\$31,904,776		\$158,428,712
Sales Tax												
2010	\$1,071,199	\$1,768,837	\$55,422	\$144,722	\$1,160,050	\$18,219	\$7,641	\$30,842	\$6,710,741		\$34,273,977	\$45,241,649
Hotel Occupancy Tax												
Hotels	\$209,500										\$633,000	\$842,500
Vacation Rentals	\$85,200		\$55,300	\$70,200					\$2,900		\$256,600	\$470,200
Total Hotel Occupancy Tax	\$294,700		\$55,300	\$70,200							\$889,600	\$1,309,800
Mixed Beverage Tax												
2010	\$139,601		\$1,184	\$10,075	\$66,407				\$27,923	\$245,191	\$1,798,061	\$2,288,442
TOTAL FISCAL IMPACT	\$2,446,981	\$1,957,840	\$1,901,069	\$3,671,864	\$4,911,848	\$168,728	\$132,021	\$222,568	\$122,472,853	\$32,149,966	\$36,961,638	\$207,246,861

Municipal and county expenses are not included in this analysis because costs associated with Lake Travis are not clearly delineated. Additionally, expenses fluctuate based on budget appropriations, local priorities, and other causes that are not tied to the lake.

B. ECONOMIC IMPACT – BASE CASE

Key Conclusion: RCLCO estimates Lake Travis generated 2.8 million visitor-days in 2010 and \$168.8 million in total visitation-related spending from park visitors, boaters, and general vacationers, while boat sales totaled \$45.5 million in this base case year. This spending created an economic impact of over \$112.6 million of value-add to the local economy and supported 1,916 jobs, with total wages of \$69.4 million.

The economic impact analysis traces the flow of spending through the Travis County and regional economy and identifies changes in jobs, wages, and total output due to Lake Travis-related spending. Net economic impacts are most commonly defined as the incremental changes in measured economic activity resulting from an external (i.e. “outside”) injection of new spending into a specific region. Economic impacts are driven by direct spending or expenditures that would not occur but for the lake, and include visitor spending (boaters, park visitors, vacation renters, and second home owners), capital expenditures by boat owners and boat dock owners/renters, and boat sales.

The economic impacts were estimated using IMPLAN (Impact Analysis for PLANning), an econometric modeling system developed by applied economists at the University of Minnesota and the U.S. Forest Service. IMPLAN's Social Accounting Matrices were used to construct county-level multipliers that quantify the total effects of lake-related spending on the Travis County economy. There are three types of effects measured with a multiplier: the direct, the indirect, and the induced effects, which together equal the total economic impact. The direct effect is the known or predicted change in the local economy that is to be studied. The indirect effect is the business-to-business transactions required to satisfy the direct effect. Finally, the induced effect is derived from local spending on goods and services by people working to satisfy the direct and indirect effects.

Direct Spending and Economic Impacts

- RCLCO estimates 2.8 million visitor-days to Lake Travis in 2010. For the purposes of this study, Lake Travis visitors include park visitors, boaters, hotel and vacation renters, and second home visitors.
 - **Park Visitors** - According to LCRA and Travis County, there were approximately 499,900 visitor-days to the eleven Lake Travis parks in 2010. The total spending by local and out-of-town park visitors in the Lake Travis Study Area was \$38.0 million.
 - **Boaters** - Boaters represent the largest visitor group to the lake. Boater recreational spending totaled approximately \$40.0 million in 2010, which includes expenditures for marina services, restaurants, groceries, fuel, and recreation and entertainment. Boaters who dock in Lake Travis marinas and private boat docks spent \$39.1 million in capital expenditures in 2010.
 - **Hotel and Vacation Renters** – this group spent an estimated \$32.6 million on goods and services in 2010.
 - **Second-home Visitors** - The 5,264 second home owners spent an estimated \$58.2 million in 2010 when visiting their second homes at Lake Travis.
- In total, park visitors, boaters, hotel and vacation renters, and second home owners spent \$168.8 million in 2010, resulting in a value-add of \$90.5 million to the local economy. This spending supports a total of 1,607 jobs in Travis County, with total wages of \$53.2 million. Total jobs include jobs that are generated from both direct and multiplied spending.
- Boat sales totaled \$45.5 million in 2010, with \$29.0 million representing sales of new boats. Boat sales resulted in a value-add of \$22.1 million and supported a total of 309 jobs in Travis County, with total wages of \$16.2 million.

Figure 2: Jobs, Wages, and Total Output Supported by Lake-Related Spending

Lake-Related Activity	Employment Effects			Labor Income			Total Value Added		
	Direct	Indirect/ Induced	Total	Direct	Indirect/ Induced	Total	Direct	Indirect/ Induced	Total
Visitor Spending									
Boaters	427	146	574	\$12,357,000	\$6,785,000	\$19,142,000	\$18,248,000	\$12,019,000	\$30,266,000
Park visitors	225	69	294	\$6,585,000	\$3,096,000	\$9,681,000	\$10,118,000	\$5,763,000	\$15,881,000
Vacation renters	209	99	309	\$6,523,000	\$4,512,000	\$11,036,000	\$13,271,000	\$8,076,000	\$21,348,000
Second homeowners	332	98	431	\$9,584,000	\$4,411,000	\$13,995,000	\$14,786,000	\$8,216,000	\$23,002,000
Total Visitor Spending	1,194	409	1,607	\$34,609,000	\$18,582,000	\$53,191,000	\$56,423,000	\$34,074,000	\$90,497,000
Boat Sales	219	90	309	\$12,202,000	\$4,005,000	\$16,206,000	\$14,735,000	\$7,400,000	\$22,135,000
Total	1,413	498	1,916	\$46,811,000	\$22,587,000	\$69,397,000	\$71,158,000	\$41,474,000	\$112,632,000

C. STUDY AREA ECONOMIC ACTIVITY – BASE CASE

Key Conclusion: Study Area households and employees collectively created **economic activity of \$688 million** in the form of spending, which supported approximately **5,200 jobs**.

Most spending by primary households and employees in the Study Area is not assumed to create a net economic impact, and is instead considered impact neutral (i.e. primary household and employee spending do not represent external injections into the local economy). The reason for this is that while many households may have chosen to live in close proximity to Lake Travis for its amenity value, it is not possible without further study to determine how many of these households would choose not to live in the *region* if not for the existence of Lake Travis. RCLCO recommends conducting a detailed survey of primary households and employees in order to better understand how their behavior and characteristics are driven by Lake Travis and thus be able to translate their spending into a lake-related economic impact.

D. LAKE LEVEL IMPACTS

Lake Travis experiences stable lake levels when water elevation is between 660 and 681 feet above sea level. As lake levels begin to fall below 660, visitation and recreation begin to decrease, but the lake still receives significant economic impacts from lake-related visitation. At lake levels below 650 feet, visitation sharply declines, driven by the closure of most of the lake’s boat ramps as well as media attention, which highlights safety and accessibility issues, perceived or real, at Lake Travis. As this occurs, visitor spending decreases and creates a significant negative impact on the local economy as revenues at local hotels, restaurants, and other tourism-serving businesses fall. Additionally, Lake Travis is an amenity to the residents of neighborhoods

surrounding the lake, and extreme drops in water level could also affect the property value and transaction pace of homes surrounding the lake. Finally, reduced lake levels negatively impact the costs, revenues, and water availability of the public utilities that draw water from Lake Travis and of private wells, which rely on groundwater that dissipates (or disappears) with low lake levels. Key conclusions regarding the fiscal and economic impacts of low lake levels as well as the impacts on lake-dependent businesses are addressed below.

D.1. FISCAL IMPACTS OF LAKE LEVEL FLUCTUATIONS

Key Conclusion: Tax revenues generated from within the Study Area are sensitive to lake levels and can decrease drastically during high and low lake level seasons. Persistently low lake levels in Lake Travis could have a significant impact on fiscal revenues, which could **decrease between \$16.4 million and \$21.9 million**, or over 10 percent of 2010 revenues. The majority of this decrease, \$15 million to \$20 million, is attributed to likely decreases in property values driven by the loss of the “premium” for property on or in close proximity to the lake.

When Lake Travis experiences extreme fluctuations in water levels, the total amount of tax revenues collected by state and local entities decline. The drivers of fiscal impacts – assessment values, sales receipts, hotel receipts, and mixed beverage receipts, are highly sensitive to population size, commercial supply, economic conditions, visitation rates, lake levels, and other macroeconomic conditions. This section evaluates how much tax dollar revenues the Study Area brought to state and local agencies from 2006 to 2010, and isolates the effects of lake levels in order to understand the changes to tax revenues that result from extreme fluctuations in lake level. Due to the complexity of the economic and demographic pressures that combine to affect fiscal revenues, the analysis cannot quantify the amount of lost revenue associated with specific intervals of lake level decline. Rather, the analysis considers fiscal revenues during periods when lake levels were normal (over 660 feet) and during extreme lake level conditions (below 660 feet or above 680 feet). Figure 3 summarizes fiscal impacts in the base year changes to fiscal impacts that are associated with extreme changes to lake level.

Figure 3: Extreme Lake Level Fluctuations and Associated Fiscal Impact

	Base Case 2010	2008-2010 Average	Normal Lake Level Fiscal Impact (Net Growth)	Reduced Lake Level Fiscal Impact (Net Loss)
Residential Property Tax Revenue (000's)	\$127,465	\$125,711	n/a	-\$15,000 to -\$20,000
Sales Tax (000's)	\$45,242	\$44,233	+\$723 to +\$908	-\$1,300 to -\$1,700
Hotel Occupancy Tax (000's)	\$890	\$870	+\$18 to +\$26	-\$37 to -\$45
Mixed Beverage Tax (000's)	\$2,288	\$2,259	+\$26 to +\$87	-\$98 to -\$120

Analysis of the Premium Lake Travis Delivers to Study Area Properties and Implications of Lake Level Fluctuations

The analysis considers historical property tax assessments for land and improvement values for all residential parcels in the Study Area in order to determine the value of the premium associated with Lake Travis. This premium is important as it places an amenity value on Lake Travis and provides insight into potential property value losses that could occur should Lake Travis lose its amenity value with persistently low lake levels. The following findings demonstrate that a Lake Travis premium exists, and has been growing since 2006:

- Residential properties that are adjacent to Lake Travis are valued at a premium to other residential parcels in the Study Area and Travis County. On average, residential parcels in the Study Area that are adjacent to Lake Travis have an assessed value per square foot that is 85 percent higher than other residential parcels in the Study Area. The total value of this Lake Travis premium grew from \$677 million in 2006 to \$1.1 billion in 2010.
- If Lake Travis did not exist, the lake premium would go away, which would result in a 15 percent average reduction in assessed values for Study Area homes (waterfront homes would bear the greatest reduction of value), or a total annual reduction of \$15 million to \$20 million in property tax collections for the Study Area, based on historical property tax collections from 2006 to 2010.
- The lake premium is reflected in transaction pricing as well. The Study Area had an average of 940 sales per year between 2006 and 2010 with an average sale price of \$425,000. Of these sales, an average of 70 per year were either lake front, lake cove, or lake view, and achieved an average price of \$911,500 over the five year time period, while the remaining 870 home sales per year not located near or on the lake averaged a much lower sale price of \$384,400. On a price per square foot basis, lake related home sales received an average premium of 100 percent over non-lake related homes.

Change in Transaction Value and Volume

Historical trends for residential transaction volume in the Study Area from 2005 to 2010 indicate that economic conditions have an overriding effect on transaction volume. In periods of economic growth, transaction volume remained high even in drought years. In periods of economic recession, transaction volume declines, and low lake levels push transaction volumes down even further. Between 2008 and 2010, the average annual transaction volume was 841, which was 253 units below the 2005-2007 average annual transaction volume of 1,093. In 2009, transactions were doubly affected by a historic drought and economic recession, and transaction volumes fell to 793 for the year, 48 below the three-year average.

However, short-term changes in real estate transactions fail to capture total amenity values, or the complete economic value of benefits received by those who own property and utilize Lake Travis and its many related facilities. The amenity value of Lake Travis, one of the most popular lakes in Texas, is reflected in the sizeable real estate premiums estimated above. A permanent loss of amenity value resulting from persistently low lake elevations would eventually translate into declining real estate prices and sales volumes. Consequently, the negative effects of low water levels on the amenity value of lakefront real estate are not fully reflected in a single year of transaction data, particularly if the beneficiaries of amenity value perceive the impacts to be drought-related and temporary.

While short-term analysis of transaction trends in the Study Area do not indicate that low water levels have a lasting effect on transaction volume or pricing, case study analysis indicates that a more permanent change in water levels or water quality does affect transaction pricing. A recent study completed by the U.S. Army Corps of Engineers of lake levels in Hartwell Lake in Georgia and South Carolina indicates that there is a decline of one-third to two transactions per every foot decline in lake level, when the lake drops more than four feet below full pool. In addition, a study conducted by the Texas Water Resources Institute at Texas A&M University³, which utilized a hedonic or implicit price approach to examine the relationship between lake management practices and the value of lakefront properties, estimated that with each six foot drop in lake levels, the value of lakefront property declines by approximately 3.5 percent at Lake Travis.

Lake Travis Study Area Sales Tax

Sales receipt data indicates a positive relationship between lake levels and sales tax revenues. An average of \$536 million in sales receipts were recorded annually between 2008 and 2010, and sales tax revenues fluctuated between \$12.2 million above average to \$23.9 million below the average.

³ Lansford, Notie, Jr. and Lonnie L. Jones (1995). "Effects of LCRA Lakes on Riparian Property Values," Technical Report No. 170, Texas Water Resources Institute, Texas A&M University.

Reasons for fluctuations in sales receipts include lake levels, household growth, and the wealth effect. RCLCO attributed a weight to each variable that affects sales receipts in order to isolate the effects of lake level fluctuations.

This analysis estimates that in normal lake level years – during which time there are no sustained periods of drought or flood – approximately \$8.8 million to \$11.0 million in sales receipts above average will be achieved. This growth in sales receipts translates into an additional \$723,000 to \$908,000 in sales tax revenues above average.

Conversely, during extremely low lake level years, such as 2009, approximately \$16.0 million to \$20.0 million in sales receipts will be lost, which translates into a loss in sales tax revenues of \$1.3 million to \$1.7 million, and could also result in store closures and job losses.

Lake Travis Study Area Hotel Occupancy Taxes

Lake Travis lake levels and visitation have had a large impact on total overnight accommodation revenues. In normal lake level years – during which time there are no sustained periods of drought or flood – approximately \$10.5 million in hotel occupancy receipts are achieved by Study Area hotels. Extreme lake level decreases, such as those that experienced in 2009, could result in a decrease of \$344,500 in hotel taxable receipts, which translates into a loss of \$20,700 in hotel occupancy tax revenues to the state of Texas. Similarly, Vacation rental receipts averaged just under \$4.0 million between 2008 and 2010, and receipts were \$457,000 below this average in 2009. The amount attributable to lake levels is \$342,500, and the state of Texas lost \$20,600 in hotel occupancy tax revenue from the reduced vacation rental receipts.

Mixed Beverage Taxes

Historically, taxable receipts from the sale of mixed beverages have averaged \$15.6 million between 2006 and 2010. Between 2008 and 2010, total mixed beverage receipts averaged \$16.1 million. Taxable receipts fell \$1.0 million below the historical average in 2009. After controlling for the effects of the recession, growth, and development, the total impact on mixed beverage receipts attributed to fluctuating lake levels totals \$777,800. The state collects 14 percent of these revenues and distributes them at the state, county, and local levels. Therefore, lower lake levels resulted in a decline in mixed beverage tax revenue of \$108,900.

D.2. ECONOMIC IMPACTS OF LAKE LEVEL FLUCTUATIONS

Key Conclusion: \$168.8 million in spending by all Lake Travis visitors supported a total of 1,607 jobs in Travis County in 2010, with total wages of \$53.9 million, and total economic value added of \$90.5 million. Lake levels have a clear impact on direct spending by visitors on Lake Travis. Major fluctuations in lake levels, from either a drought or a flood, can drop visitation and spending by 14 percent to 20 percent, reducing total spending by \$23.6 million to \$33.8 million. The economic impact of this decreased spending results in losses of up to 241 jobs and a total impact of \$12.6 million on an annual basis.

Stable lake levels, defined as elevations between 660' and 681' ("full pool") above sea level, can increase visitation and spending by seven percent to 10 percent, resulting in an economic boost of up to 125 jobs and \$7.1 million in value annually. If Lake Travis lake levels break historical records and maintain a state of drought or flood for longer periods than ever experienced, visitor levels can be expected to drop more than the historical record of 20 percent. If visitor levels drop by half, the resulting economic impact could result in losses of up to 583 jobs and a total impact of \$33.5 million on an annual basis.

Figure 4: Jobs, Wages, and Total Output Fluctuations Associated with Changes in Lake-Related Spending

Visitor Category	Spending	Jobs Impact			Total Impact				
	Base Case	Base Case	+10% Visitation	-20% Visitation	-50% Visitation	Base Case	+10% Visitation	-20% Visitation	-50% Visitation
Boaters	40,011,202	574	7	-14	-35	\$30,266,000	\$349,000	-\$96,000	-\$1,744,000
Park visitors	38,038,236	294	29	-58	-145	\$15,881,000	\$1,589,000	-\$2,889,000	-\$7,854,000
Vacation renters	32,556,930	309	45	-83	-187	\$21,348,000	\$2,905,000	-\$5,391,000	-\$12,426,000
Second homeowners	58,187,203	431	43	-86	-215	\$23,002,000	\$2,301,000	-\$4,226,000	-\$11,501,000
Total Visitor Spending	168,793,571	1,607	125	-241	-583	\$90,497,000	\$7,144,000	-\$12,602,000	-\$33,525,000

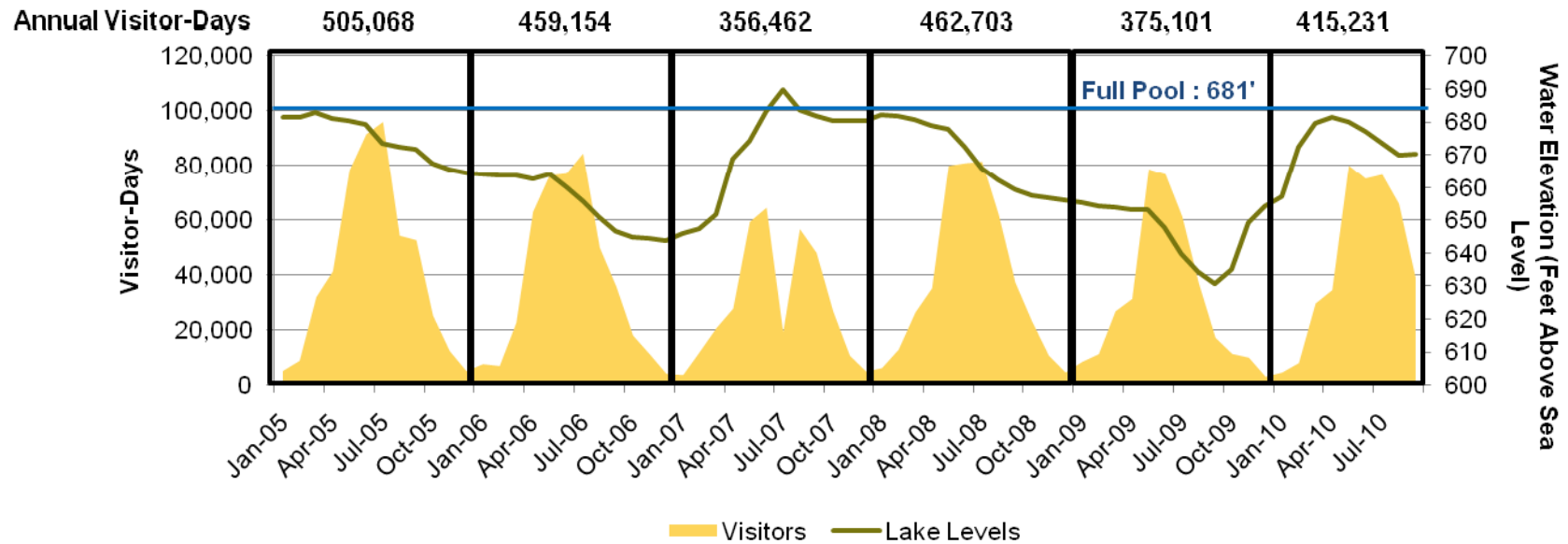
The following discusses the various components influencing the overall economic impact of lake level fluctuations.

Visitation Trends

Historical visitor data are unavailable for Lake Travis in any of the visitor categories except for park visitors; therefore, this analysis uses trends in park visitor-days as a proxy for all visitation trends to Lake Travis.

Comparing visitation to lake levels from 2006 to 2010 indicates that lake levels have a clear impact on visitation, and both extreme droughts and flooding cause visitation to drop. Lake Travis can support between 460,000 and 500,000 park visitor-days in years when lake levels remain between 660 to 680 feet. In years with extreme drought or flood conditions, such as 2007 and 2009, park visitation numbers fell to 350,000 to 375,000 visitor-days annually.

Figure 5: Monthly Lake Levels and Park Visitation



Using park visitors as a proxy for all visitors suggests that when lake levels drop or rise for an extended period of time such that the lake becomes unusable, visitation levels can drop by 14 percent to 20 percent from the average annual rate of 2.8 million visitor-days, which translates into decline in 362,000 to 560,000 visitor-days per year. During years when the lake levels remain stable throughout the summer, such as 2006 and 2008, the visitation rate exceeds the average by seven percent, which translates into 196,000 more visitors per year. In 2005, lake levels remained between 664 feet and 684 feet for the entire year, and visitation levels exceeded average rates by 15 percent.

Spending by park visitors supported a total of 294 jobs in Travis County in 2010, with total wages of \$9.6 million, and total value added of \$15.9 million. A 20 percent drop in park visitation is expected to result in an estimated loss of 58 jobs and \$2.9 million in total economic value.

Boating Trends

The effects of lake levels on boating in the public parks are estimated based on the daily and annual trailer permits issued by Travis County and LCRA between 2006 and 2010. The changes in daily boat permits over the five-year time period suggests that both lake levels and economic conditions have a large impact on boating on Lake Travis. In 2006, when lake levels dropped, boaters moved between parks with shallow water to parks in deeper

channels, and the total number of daily boat permits did not dramatically change. There was a drop in daily boat usage in 2007 because flooding rendered the public ramps unusable. The lake level dropped in 2009 and daily permits did not decline for the year. There was a marginal increase in daily permits in 2010.

Annual boat permits at the public parks exhibit slightly different trends than daily boat permits. In 2006, there were 863 annual trailer permits issued, which is relatively high given it was a low lake level year. However, individual park data shows that the number of permits remained high because parks in deeper water sold more annual permits. Annual permit sales remained relatively constant in 2007; permits are valid for an entire year and boaters could not foresee the July 2007 flood. Annual permits fell slightly in 2008 and fell even more dramatically in 2009 to the five-year lowest level of 689 annual permits per year. Annual boat permits rose again in 2010. The drop in annual trailer permits in 2009 and increase in 2010 suggests that annual permit holders are more sensitive to lake levels. However, it is important to note that the decrease in annual permits in 2009 may have resulted in annual permit holders opting not to renew their annual permits and buying daily permits instead due to the uncertainty of lake levels. Thus, the combination of a minimal decline of daily permits and significant decline of annual permits created a dramatic net decrease in boater-days, which was almost entirely due to the low lake levels.

\$40 million in spending by boaters supported a total of 574 jobs in Travis County in 2010, with total wages of \$19.1 million, and total value added of \$30.3 million. A 20 percent drop in boating expenditures is expected to result in an estimated loss of 14 jobs and \$96,000 in total value.

Boat Sales Impacts

The sales of both new and used boats are also deeply affected by both lake levels and the economy. Between 2006 and 2010, the characteristics of boat sales changed as demand shifted from a majority of new boat sales to a larger prevalence of used boat sales. Used boats sell at approximately half the cost of new boats, and this shift had a multiplied effect on the dollar volume of all boat sales.

Between 2008 and 2010, Travis County had an average of 4,980 total boat sales, of which approximately half were new boats. In 2009, boat sales were well below their average at 4,590, which can be attributed to a variety of factors: residential development, the economy, lake levels, etc. However, based on RCLCO's analysis, an estimated 273 of the 391 lost sales are attributable to lower lake levels in 2009. The same analysis also suggests that stabilized lake levels, as in 2008, can boost boat sales by as much as 400 total sales.

D.3. EFFECTS ON LAKE TRAVIS BUSINESSES AND UTILITIES

Key Conclusion: Lake Level fluctuations result in decreased demand for services provided by lake-related business and are the primary concern of Lake Travis business owners. The business operations of boat charter companies, scuba operators, restaurants, overnight accommodations, spas, golf courses, and other tourism-oriented companies are all directly affected by lake levels. Extreme drops in Lake Travis water levels force marina owners to move docks to deeper waters, or even close docks altogether. Anecdotal evidence suggests that, during the extreme lake level drop caused by the drought of 2009, marinas spent \$10,000 to \$50,000 to move the marina and extend infrastructure to the dock. Some shallow-water marinas spent over \$300,000 for more complicated moves. Many lake-dependent businesses have maintained revenue streams by diversifying their operations through Internet sales and other non-lake related revenue sources, but this can only sustain their business if low lake levels are temporary.

Lake Travis supports a variety of businesses that rely upon the lake and thrive most in years when lake levels are stable. RCLCO conducted one-on-one interviews with forty stakeholders who own and manage businesses on or near Lake Travis in order to better understand how lake levels affect revenues, expenses, employment, and overall viability for different types of businesses. The interview list includes owners of various business types, including marinas, concessions, boat rentals, restaurants, and scuba operators.

Perception of Lake Travis being closed for business was raised most frequently as a critical lake level issue. Local businesses indicated that media reports of low water levels cause cancellations in boat charter rentals and reductions in demand for lake recreation activities, and kept visitors from Houston, Dallas, and throughout Texas from making the trip to Lake Travis.

Many lake-dependent recreational businesses have maintained revenues and stayed afloat during low water level years by diversifying their business offerings. Kayak rental operators expanded online sales, scuba outfitters taught swimming lessons in dive-training pools, and restaurants opened souvenir stores. The entrepreneurial spirit of local businesses has helped local businesses overcome what could otherwise have been crippling loss due to low lake levels.

At low lake levels, some community and municipal water utilities may be unable to pump water to provide basic municipal service. Approximately 23 utilities currently utilize Lake Travis's water supply. As lake levels drop, pumping and water treatment become more expensive. Some of the utility costs are major expenses, such as adding or extending a barge (WCID spend over \$350,000 in 2009 moving its barge), buying new pumps, or relocating or reconstructing raw water intakes. Other expenses and revenue losses are incurred more regularly when lake levels drop. For example, utilities must use more electricity for pumps when lake levels drop. For example, for WCID17, every 10 foot drop in lake levels results in an estimated \$1,000 per month in additional electricity charges incurred. Although the exact figures are not available, elevated electricity expenses were reported by other utilities that had to relocate their respective intakes.

E. WATER QUALITY IMPACTS

Key Conclusion: Recent studies and interviews with locals suggest that the water quality is a feature of Lake Travis that visitors like best, and any degradation in water quality could lead to reduced visitation and use of recreation activities, closure of lake-related businesses, increased costs of water treatment, and possibly negative effects on real estate values.

As part of this study, RCLCO was tasked with addressing the economic impact that water quality degradation might have on the local economy. Water quality is especially crucial at Lake Travis since the lake serves as a source of drinking water for residents in Travis County and is a popular recreational destination. In addition, the lake supplies water for commercial establishments, public offices, industries, institutions, and agricultural irrigation.

Unlike the lake level analysis portion of the study, there is no demonstrated record of water quality fluctuations at Lake Travis from which to calculate any fiscal or economic impacts associated with diminished water quality. Water quality to date has been consistently good at Lake Travis (there has reportedly been minor degradation of quality since the lake's founding), and with the exception of flood events that temporarily elevate pollutants in the lake (and close some lake facilities) as well as reportedly higher turbidity levels at lower lake elevations (due to shallower, cloudier waters), there is no historical record or data from which to calculate any fiscal or economic impacts poor water quality has had on the area.⁴ It is of course good news that poor water quality is not a recurring problem at Lake Travis; however, given the lack of any data related to changes in visitation, increases in manufacturing costs, property value losses, or other negative impacts due to poor water quality, RCLCO was required to employ alternative methodologies to help inform the potential implications of diminished water quality. To address the possible repercussions, RCLCO:

- Evaluated previous studies regarding recreational users of Lake Travis and the relative importance of water quality on the recreational experience
- Conducted interviews with businesses across each of the key industry sectors that rely on good water quality
- Analyzed studies done of other lakes where water quality degradation lead to diminished property values to gain an understanding of the potential impacts should lower-quality water become an issue in the future

⁴ Park closures did occur during flood events which raised pollutants to unsafe levels which impacted park visitation; however, closures are not a good indicator of what would happen should pollutants consistently reach levels somewhere between current levels and flood condition levels, levels that would not prompt closures but might impact visitors' desire to go to Lake Travis. It is also important to note that this study is not asserting that no negative economic impacts have occurred as a result of any water quality/clarity degradation, but there is no data available to understand what impacts have occurred, if any.

- Conducted research of other lakes in similar markets that have experienced water quality degradation and the costs associated with reversing the deterioration and restoring the lake to previous levels of quality.

In evaluating previous studies regarding water quality and recreational lake users, it is clear that poor water quality may reduce Lake Travis' appeal as a recreational destination, particularly for contact recreation such as swimming, water skiing, or windsurfing. In 2005, the Texas Water Conservation Association conducted a study of the correlation between user perceptions of recreation impairment and chlorophyll-a concentrations, an indicator of planktonic algae and the nutrient-related condition most frequently affecting the desirability of reservoirs for recreational uses. The study revealed that an increased concentration of chlorophyll, which equates to higher nutrients and lower water clarity, is correlated with more users reporting impairment to recreational use.⁵ A change in user perception of water quality could impact the desirability of restaurants and facilities that benefit from high-quality water views as well as recreational activities such as scuba and boating. A 2009 study on recreational boating at Lake Travis, produced by the LCRA in association with the Department of Recreation, Park, and Tourism Sciences at Texas A&M University, indicates that water quality remains a physical feature of the lake that boaters like best. Although other factors were relatively more important to boaters than water quality, 5 percent, 7.6 percent and 11.1 percent of boat ramp users, marina slip tenants, and lakeshore property owners, respectively, indicated that they either agreed or strongly agreed that they were bothered by poor water quality at Lake Travis. The question is whether these lake users were dissatisfied enough with the level of water quality to alter their behavior and direct their spending towards other activities should perceived water quality problems stay the same or worsen (the study did not address the direct response to poor water quality). It is difficult to determine how boater visitation at Lake Travis might decrease should further water quality degradation occur in the lake. However, if the number of boaters decreased by 10 percent (from 2010 visitation numbers), there would be an economic impact of \$349,000, which correlates to a loss of seven jobs as a result of decreased spending on gasoline, concessions at marinas, grocery purchases, and other miscellaneous expenses. If this drop in boater visitation were applied to other visitors to Lake Travis including park visitors, vacation home renters, resort hotel guests, and other visitors spending would be impacted by \$10.5 million resulting in an overall negative economic impact of \$7.1 million and a loss in 122 jobs.

Interviews with local businesses and industries were inconclusive with respect to perceived water quality issues. Interviews with owners of scuba shops in Lake Travis revealed that the scuba industry at Lake Travis has contracted due to diminished water clarity. Anecdotal reports from scuba operators suggest that the reduction in scuba businesses is tied to the reduced visibility in the lake. While Lake Travis remains the premier destination for scuba certification for dive instructors throughout the state, both water quality/clarity and water levels could challenge the capacity of scuba shops to remain in business at Lake Travis.

⁵ Texas Water Conservation Association, "Development of Use-Based Chlorophyll Criteria for Recreational Users of Reservoirs," June 2005

Interviews with representatives of numerous companies in the region that are large users of water including beverage makers, semiconductor manufacturers, medical device manufacturers, and chemical companies, indicated that if water quality degraded to the point where additional treatment was required, local utilities supplying municipal water would incur the increased costs of treatment, costs which would be passed on to consumers as well as commercial users. These additional purification costs, however, were not viewed as an expense which would make the cost of producing goods infeasible and thus require the business to shut down operations, nor would the increased costs give companies pause on whether to invest further into their presence in the Austin market. The reasons for investing in Austin and Travis County were numerous and broad, and, while water quality and cost were important factors, they were not the primary deciding factors on whether to invest in the region (electricity and chemical costs were cited as more expensive components to doing business). In fact, water *availability* was of higher concern to many industries, with many concerned that lake levels and the storage capacity of Lake Travis might impact the ability of local utilities to deliver the amount of water needed for manufacturing processes. Although all companies acknowledged that degrading water quality was indeed undesirable, and they also agreed that reduced water quality would increase their overall costs, RCLCO could not with certainty determine that these increased costs would have any negative economic impact on the region in the form of job losses, decreased investment by existing employers, or other economic disadvantages. It is possible that the increased costs could result in some job losses at some companies, but more than likely this would make their cost of business higher and perhaps lower their level of competitiveness. It is also possible that higher water processing costs could diminish the Austin region's competitiveness in attracting the types of industry discussed above, but it was beyond the scope of this engagement to determine the extent to which water processing costs play into a company's decision to invest in a region or relocate from one region to another. This would require extensive knowledge about the cost structure of innumerable companies and the relative importance of water quality in their decision-making processes.

There are no data to support that real estate values have suffered at Lake Travis as a result of any perceived water quality or water clarity degradation that has occurred to date. However, studies in Maine and Minnesota indicate that a long-term decline in water clarity has a corresponding negative effect on value of lakefront properties. Based on these studies, lakefront land values may drop between 5 percent and 10 percent for each one meter drop in water clarity⁶ The Maine and Minnesota case studies are instructive in hypothesizing potential implications on property values at Lake Travis should a decrease in water quality or clarity occur in the future. A study of all of the relevant variables unique to Lake Travis would need to be conducted to more specifically pinpoint possible property value losses with respect to water quality levels and the potential fiscal impacts in the study area. However, if we assumed the conditions at the lakes in Maine and Minnesota were similar to those at Lake Travis, and if lakefront land values dropped between 5-10 percent with a one meter drop in Lake Travis water clarity, it would result in property value losses of \$27 million to \$53 million in the study area. More detailed analysis of these studies is included in the full version of this report.

⁶ A one-meter drop in water clarity means that the naked eye can see to a water depth of one meter (or 3.28 feet) less than they once could

I. INTRODUCTION

A. Objectives of the Study

The Lake Travis and Economic Study considers a Study Area that surrounds Lake Travis and is wholly contained within Travis County. The Study Area is bounded by Ranch Road 620 and Anderson Mill Road to the east, Highway 71 to the south, FM 1431 to the north, and the Travis County line to the west.

Goals of the Lake Travis Economic Study include the following:

- A.** Identify and quantify the streams of revenues (property tax, sales tax, and other sources of revenue) that accrue to Travis County, the cities surrounding Lake Travis, and the other governmental entities based on development and spending in the Study Area for the base year 2010. This is defined as the “**base case fiscal impact.**”
- B.** Quantify the amount of lake-related spending within the Study Area and provide an estimate for the total economic impact associated with lake-related spending for the base year 2010. Economic impacts include jobs created, associated wages, and total economic output. This is defined as the “**base case economic impact.**”
- C.** Determine the amount of **economic activity** occurring among primary residence households and employees within the Study Area for the base year 2010.
- D.** Assess both the **fiscal and economic impacts of fluctuating lake levels.** Quantify the impact low lake levels have had on spending and jobs associated with the lake (economic impact) as well as on tax revenues to the County, local municipalities, and other taxing jurisdictions (fiscal impact).
- E.** Assess the potential **fiscal and economic impacts associated with diminished water quality** at Lake Travis.

The above goals were designed to understand the contribution that Lake Travis and lake-driven spending have on the regional economy, as well as the value of the study area, much of the development of which is driven by the existence of the lake. Given the above objectives, it is also important to identify impacts that are not covered by the study. First, Lake Travis' current role and value in the management of municipal and industrial (M&I) water supply for Metro-Austin was not analyzed. Without a consistently available supply of water, the Metro-Austin economy likely would not function in the way it does today, nor would it have grown to the size it is today. In addition, without Lake Travis, long-term future economic growth potential that is linked to Lake Travis would not occur, unless a replacement amenity existed. Regions, cities, communities, and other geographic areas often experience economic growth given the existence of an important amenity, be it a recreational facility, a reputation for having exceptional schools, or even a desirable climate. These economic benefits might be measured by changes in property values (as addressed in this study), rents in a region with desirable amenities (which

generate additional local tax revenues used to elevate local public services important for additional development), or reduced business labor expenses resulting from workers willing to accept lower wages in more desirable locations which in turn encourage business expansion. Undoubtedly, the existence of Lake Travis has been an important factor in the historical population growth of Travis County and the Austin region, and will continue to be an important component to the region's economic growth. The focus of this study, however, is on the shorter-term incremental effects of past low lake water levels. The potentially significant longer term economic effect of reduced population growth in the region, if such extremely low lake levels and/or water shortages were to persist over a long time period, is not directly addressed. To understand the impacts of a diminished water supply, the study would have required a deep understanding and analysis of the cost of supplying replacement water and the effects of resulting supply shortages on the regional and national economy. We recommend that such a study be conducted, although we recognize that Austin has an Integrated Water Management Plan to address its long range water supply needs.

Another type of impact that was not considered in this analysis is the consumption value of Lake Travis. The consumption value is defined as the direct value that lake users receive from utilizing Lake Travis and its many related facilities. The most quantifiable use value is total expenditures on admission fees or other applicable charges to gain access to the lake's facilities; however, there are other non-use consumption values that are not captured by suppliers. For example, there are thousands of residents in the Austin region that rarely (or never) visit an amenity like Lake Travis, but receive non-use consumption value as reflected in their having the option of being a future user, or through the indirect quality of life benefits they receive from the existence of such a valuable natural resource in the community. This type of consumption value requires data not available for this study as well as complex technical analysis.

B. Methodology

The Lake Travis Economic Study begins with an assessment of the base case, which measures the fiscal and economic impacts associated with Lake Travis in 2010. The base case for this analysis is 2010, which is both the most current year for which data are available and was an average lake-level year; therefore, the data are not skewed by extreme droughts or floods. The fiscal impact analysis estimates the current streams of revenues (property tax, sales tax, and other sources of revenue) that accrue to the State, County, and local jurisdictions as a result of development and spending on the lake. The economic impact analysis estimates the lake-related spending and the total economic impact of that spending. The economic impact analysis quantifies the multiplier effect of spending on both jobs and total spending within Travis County and the region.

The lake level analysis considers economic and fiscal impact trends over time in order to determine the extent to which Lake Travis water levels impact the local economy as well as tax revenues. This analysis evaluates lake levels relative to valuations, transactions, spending, visitation, and other lake-related activities in the Study Area from 2006 to 2010. The 2006 to 2010 timeframe provides five years worth of data to analyze, and during this time period Lake

Travis had some years that were at full pool, and at least two years that experienced severe droughts and floods. The Study Area has experienced intense development since 2006, which directly affects the economic and fiscal impacts generated. For this reason, the analysis only considers data from 2006 onward. The goal of the analysis is to identify correlations between lake levels and economic and fiscal impacts, and to quantify the impacts of extreme fluctuations in water level.

Between 2006 and 2010, population growth, commercial development, a national and local recession, and lake levels all contributed to changing household and consumer behaviors in the Study Area. This analysis isolates and solves for the effects of lake level fluctuations by comparing economic and fiscal impacts in the Study Area to control sets of data. Control data includes real estate trends surrounding neighboring Lake LBJ, visitation trends for other Central Texas lakes managed by the Army Corps of Engineers, and economic impact studies conducted for Lake Hartwell and Lake Lanier, both in Georgia. The analysis also isolates and evaluates the weighted contribution of the various macroeconomic, lake-related, and socio-economic factors that could have contributed to changes in economic and fiscal impacts.

The water quality analysis considers the economic and fiscal impacts that water quality degradation might have on the local economy. Water quality to date has been fairly consistently good at Lake Travis, and with the exception of flood events that temporarily elevate pollutants in the lake, there is no historical record or data that demonstrates the impacts poor water quality has had on these industries. Nevertheless, RCLCO conducted interviews with lake-dependent businesses, evaluated previous studies regarding recreational users of Lake Travis, and analyzed case studies that considered persistent declines in water quality for other lakes.

II. STUDY AREA OVERVIEW AND TRENDS

A. Lake Travis Overview

Geography and History

Lake Travis, consisting of the large pool created by the impounding of the Colorado River by the Mansfield Dam, has the greatest storage capacity of the seven reservoirs known as the Highland Lakes, and is a multi-purpose reservoir snaking 63 miles upriver from Travis County into southern Burnet County. The lake covers 18,929 acres, has a capacity of 260 billion gallons according to the LCRA, and has a maximum width of four and a half miles. Aside from its use for flood control, hydroelectric power, water quality, and water supply, Lake Travis supports broad recreational visitation and diverse fish and wildlife habitats.

Formation of Lake Travis began in 1937 when the 180 feet-high and 4,000 feet-long Marshall Ford Dam was built to provide cheap electricity to the region. Since few property owners resided on the cedar grove canyon lake site, land for its construction was not difficult to acquire. Money to raise the dam to 266 feet was provided by the U.S. Bureau of Reclamation and the Public Works Administration in 1939 after a severe flood caused considerable damage to the area. This prompted an investigation into the flood control plan of the Lower Colorado River Authority (LCRA), a non-profit public utility created by the Texas Legislature five years prior. As a result, the LCRA formally agreed to reserve 800,000 acre-feet of storage capacity at the dam for flood control purposes. Electricity generation commenced in 1941 and the structure was renamed Mansfield Dam after U.S. Representative J.J. Mansfield, who assisted in the project's development.



(Mansfield Dam photo taken 11/1/40 and is courtesy of LCRA Corporate Archives)

Figure 6: Lake Travis



Recreational Uses

Lake Travis is one of the most popular recreational water resources in the state of Texas, attracting an estimated 2.8 million visitor-days per year. With its transparent, emerald green water, Lake Travis is a draw for water sports enthusiasts, and many recreational areas located around the lake provide facilities for scuba diving, power boating, sail boating, parasailing, camping, picnicking, swimming, windsurfing, wildlife viewing, and related activities. These areas include fee campgrounds with numerous sites and day-use recreational areas. The lake offers 11 boat ramps and 14 full-scale marinas, along with many private docks. Nine county parks totaling just less than 3,000 acres, two state parks totaling 6,000 acres, and a variety of commercial enterprises also operate recreational facilities around the reservoir.

History of LCRA

In 1933, legislation was drafted creating a Colorado River Authority, which is modeled after the federal Tennessee Valley Authority. The bill granted authority to detain and sell water, generate electricity, prevent flood damages, and implement reforestation and soil-conservation programs. In 1935, the Lower Colorado River Authority opened for business.

Seizing the potential LCRA and its dams offered the region, Lyndon Johnson, a newly elected Congressman from Austin, persuaded the conservation and reclamation district to sell electric power from its dams to Central Texas communities and rural areas. LCRA constructed the transmission lines that served customers of the region's first two electric cooperatives: Pedernales and what is today Bluebonnet.

Overview of Lake Water Management

Electricity continues to be LCRA's primary revenue source today. The utility serves 43 cities and electric cooperatives that in turn serve more than 1.1 million Central Texas residents in 55 counties. Due in part to hydroelectric power generated with water from Lake Travis, LCRA's wholesale electric rates are among the lowest in Texas.

The six Highland Lake dams, once the major sources of LCRA's electric generation capacity, now provide power at times of peak demand as water levels allow. When fully operational, the dams' generating stations can supply up to 292 megawatts of electric power, which represents about two percent of their customer's annual energetic demand. The dams, however, still play an important role in generating energy because they can produce electricity relatively quickly. This becomes essential during demand spikes on hot summer days because they can produce electricity more quickly than natural gas or coal plants. LCRA is currently undertaking a multi-year rehabilitation program to increase the useful life, generating capacity, and production efficiency of the dams.

Mansfield Dam, which forms Lake Travis, is the only LCRA dam designed to contain floodwaters. Their other dams pass floodwaters downstream to Lake Travis, where the water is stored in a flood pool until it can safely be released downstream. This process further adds to variations in the lake's water elevation.

Lake Travis also serves as a reservoir, storing water for residential communities, industry, and aquatic life along the river according to a plan approved by the state of Texas. LCRA supplies drinking water to 650,000 people, as well as water for industry, energy, recreation, agriculture, and ecosystem preservation. When springs and tributaries that feed into the lower river do not provide enough water to meet downstream needs, including the need for fresh water in Matagorda Bay on the Gulf Coast, water is released from lakes Travis and Buchanan, both storage reservoirs. The bay and estuaries are reliant upon fresh water from the Colorado River to provide a healthy habitat for fish and other aquatic life.

The volume of water released from the lakes varies depending upon multiple factors, including their water levels and the amount flowing to replenish the lake and river system. Normally, the releases are coordinated to provide an ideal habitat. If the lakes are low, however, the intent of releases is to keep salinity from reaching critical levels.

During times of severe drought, there is not enough water for all purposes and the lower Colorado River flows at greatly reduced rates, and Lakes Travis and Buchanan drop significantly from their storage capacities. The allocation of water during water supply shortages is described by the water management plan, and LCRA takes action at key points as the lake water level drops. These action steps include first asking customers to voluntarily reduce water use. If the drought intensifies, LCRA may call for mandatory conservation measures. Extremely low levels trigger the restriction of all stored water releases for agricultural use.

Residential Neighborhood Expansion

Between 1880 and 1920, Austin, Texas slipped from having the fourth largest population in the state to tenth largest, mostly due to a lack of productive oil fields. After 1918, Austin worked to position itself as a residential city, acquiring Barton Springs. The City worked to identify itself as a residential city with water recreation options. Progressive ideals like city planning and beautification became city policy; a recreation department was established, and by 1940 the city had a multitude of parks, pools, and aquatic programs.

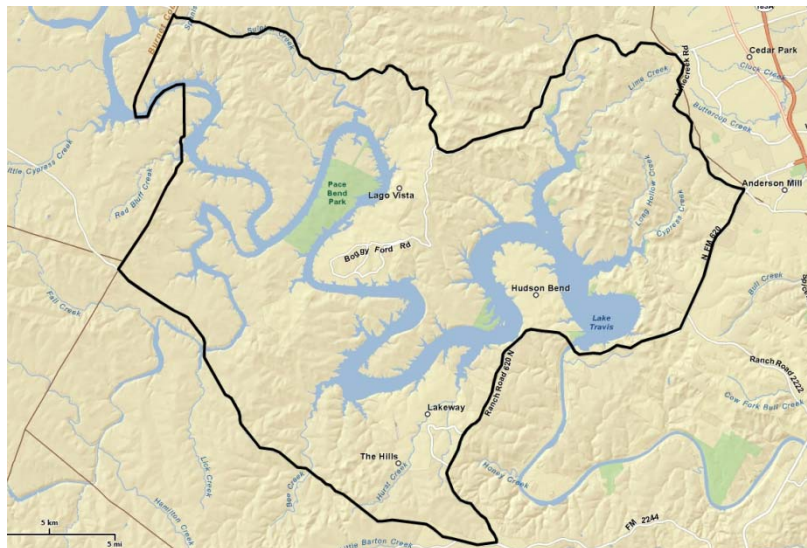
In the 1930s when Lake Travis was created, Austin's population grew at a faster rate than in any other decade during the twentieth century, increasing 66 percent from 53,120 inhabitants to 87,930. The construction of the Mansfield Dam in conjunction with other dams brought great benefits to Austin without which the region's later growth would have been unlikely: cheap power, an end of ravaging floods, a plentiful supply of water, and recreation on the Highland Lakes which enhanced the city's appeal as a place to live.

In the 1960s, resort communities like Lakeway, Lago Vista, Point Venture, and Briarcliff were founded around Lake Travis, offering the growing number of Central Texans a lakeside alternative to urban life. Today, resort destinations on all sides of the lake boast four golf courses, high-dollar homes, private airstrips, and a quality of life that is enhanced by proximity to water. One of the reasons for the popularity of Lake Travis is its adjacency to metropolitan Austin. The population within a 30-mile radius of the lake, which includes a large portion of Metro-Austin, has almost doubled since 1990, rising from 737,914 to 1,537,585 according to the Census.

B. Study Area Demographic and Economic Conditions

The Lake Travis Study Area encompasses approximately 150 square miles and contains portions of the following cities: Briarcliff, Jonestown, Lago Vista, Lakeway, Point Venture, Volente, Austin, and Village of the Hills. The Study Area is located entirely within Travis County and is bounded by Ranch Road 620 and Anderson Mill Road to the east, Highway 71 to the south, FM 1431 to the north, and the Travis County Line to the west.

Figure 7: Lake Travis Study Area



The Study Area currently has a population of just over 43,500 and approximately 18,000 households. The average household income for the Study Area is \$82,000, and ranges from \$48,400 in Point Venture to \$125,600 in Austin. Of the total households, 13,200 (72 percent) have incomes greater than \$50,000, and 13,700 (76 percent) own their primary residence. The median age of the Study Area population is 44.2. The distribution of population and households within the Study Area's relevant jurisdictions is shown below in Figure 8.

Figure 8: Population, Household, and Median Income Trends (2000 – 2010)

	Lake Travis Study Area	Study Area Located Within:							
		City of Briarcliff	City of Jonestown	City of Lago Vista	City of Lakeway	Village of Point Venture	Village of Volente	City of Austin	Village of the Hills
2010 Population	43,537	1,081	1,703	6,336	9,716	726	486	2,098	1,937
2000-2010 Ann. Growth	4.8%	1.9%	3.2%	3.8%	2.1%	6.7%	4.1%	5.1%	2.6%
2010 Households	18,093	456	726	2,834	3,857	332	217	847	867
2000-2010 Ann. Growth	5.0%	2.1%	3.8%	4.1%	2.2%	6.6%	4.1%	5.7%	4.0%
2010 Median HH Income	\$81,946	\$83,883	\$56,071	\$68,441	\$97,819	\$48,408	\$78,108	\$125,583	\$111,664
2000-2010 Ann. Growth	1.5%	1.0%	0.7%	1.8%	1.4%	0.3%	2.0%	2.2%	-0.3%

SOURCE: ESRI Business Analyst

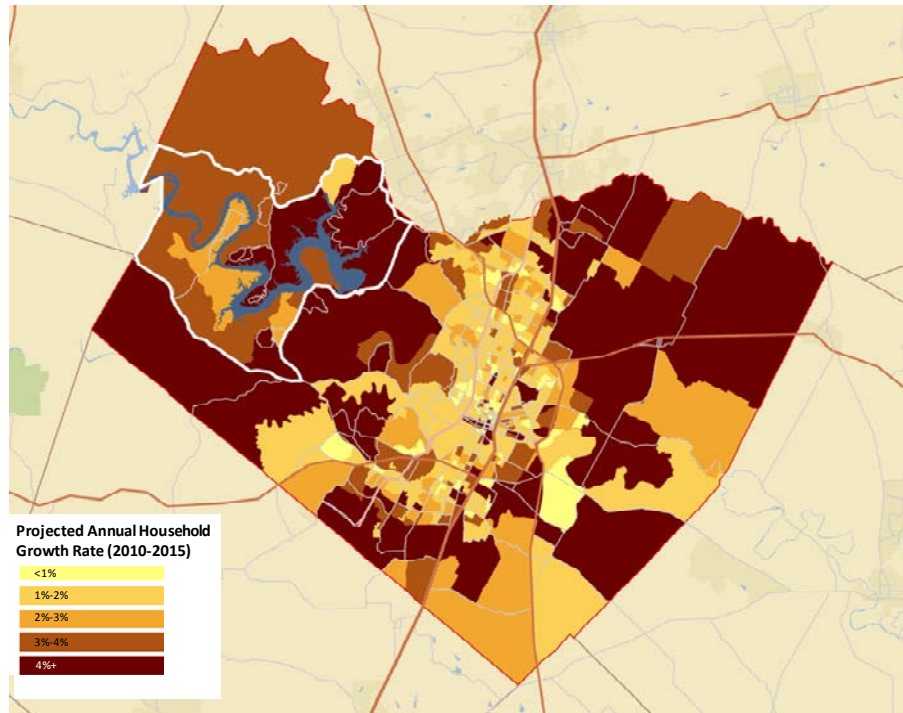
Lake Travis attracts a wealthier population that is more likely to purchase a home than Travis County as a whole. Additionally, the Study Area is home to an older population, as 15 percent (6,500) is over the age of 65 compared to 7.5 percent (79,000) for the county. Moreover, the Study Area is projected to experience much stronger growth over the near-term, based on ESRI Business Analyst’s five-year projections. The Study Area population and households are expected to grow twice as fast as the state overall and approximately 50 percent faster than Travis County, increasing its share of the County’s households, while the city of Austin is expected to experience slower growth and a decreasing share of total County households. Similarly, owner households and median household income in the Study Area is expected to significantly outpace that of the state and county.

Figure 9: Projected Growth Rates State of Texas, Travis County, and Lake Travis Study Area (2010 – 2015)

	TRAVIS COUNTY	CITY OF AUSTIN	STUDY AREA
HOUSEHOLDS			
2010	417,016	322,675	18,093
2015	480,880	364,213	22,079
SHARE OF COUNTY HOUSEHOLDS			
2010	100.0%	77.4%	4.3%
2015	100.0%	75.7%	4.6%

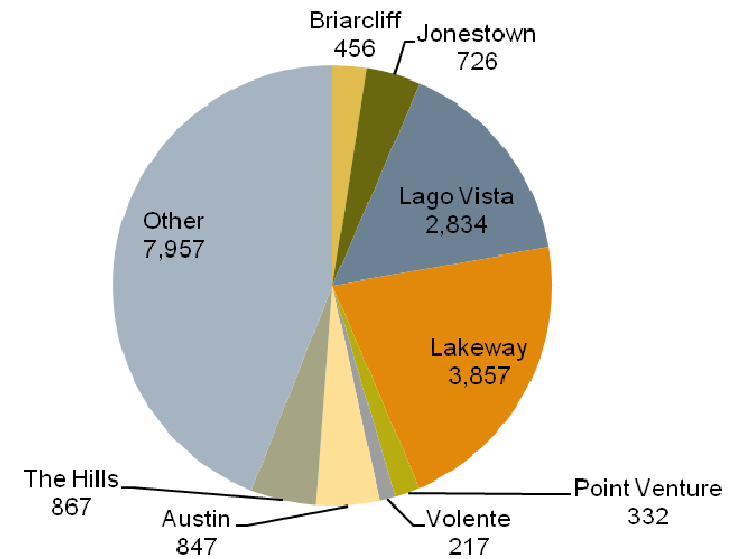
SOURCE: ESRI Business Analyst

Figure 10: Travis County Annual Projected Household Growth Rates (2010-2015)



SOURCE: ESRI Business Analyst

Figure 11: Household Distribution by City (2010 – 2015)



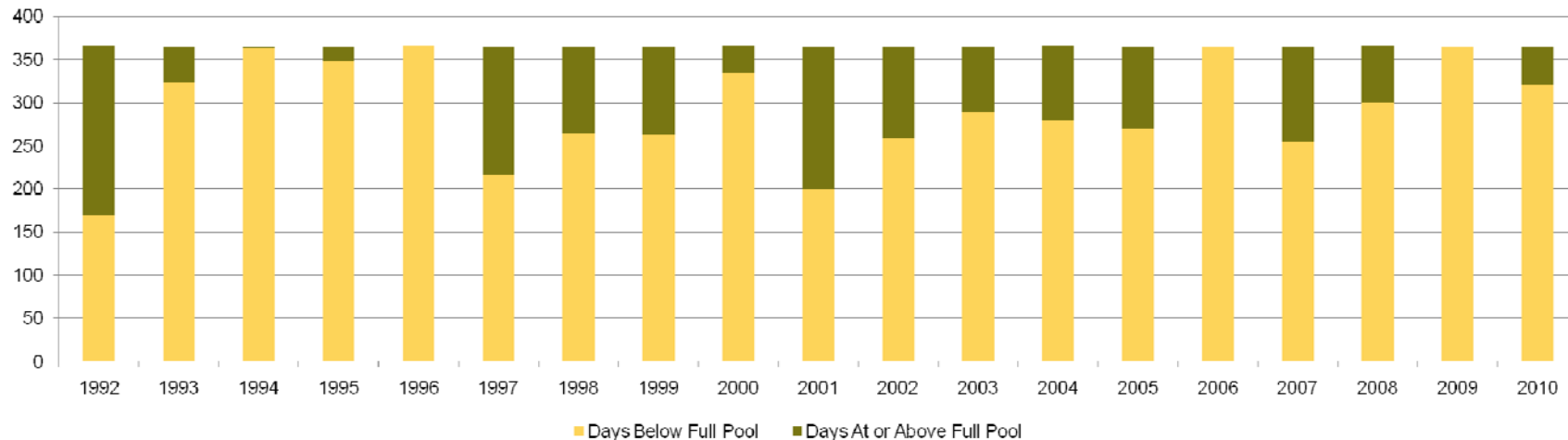
SOURCE: ESRI Business Analyst

The Lake Travis Study Area contains approximately 9,600 employees. The largest sectors within the Study Area are Retail Trade and Accommodation and Food Services, which are industries primarily driven by Lake Travis. Of the relevant jurisdictions within the Study Area, Lakeway and the area of Austin within the Study Area are the largest employment centers, home to 2,798 and 1,049 employees, respectively.

C. Lake Travis Water Levels

Lake Travis has the largest storage capacity of the seven Highland Lake reservoirs and serves as the primary flood control reservoir in the Highland Lakes chain. Lake Travis is considered to be at full pool when lake level is 681 feet above sea level. The Lake Travis historical minimum lake level is 614 feet in 1951, and the maximum is 710 feet in 1991. Historically, Lake Travis has been below full pool for the majority of each year. Based on daily water levels between 1992 and 2010, Lake Travis was below full pool an average of 80 percent of each year. In the most extreme cases, water levels can be below full pool for the entire year, which was the case in 1996, 2006, and 2009. Through this roughly 20 year time period, water levels were above full pool for more days than they were below in only a single year, 1992. Figure 12 shows the distribution of days above and below full pool from 1992 and 2010.

Figure 12: Days Above vs. Days Below Full Pool (1992 – 2010)

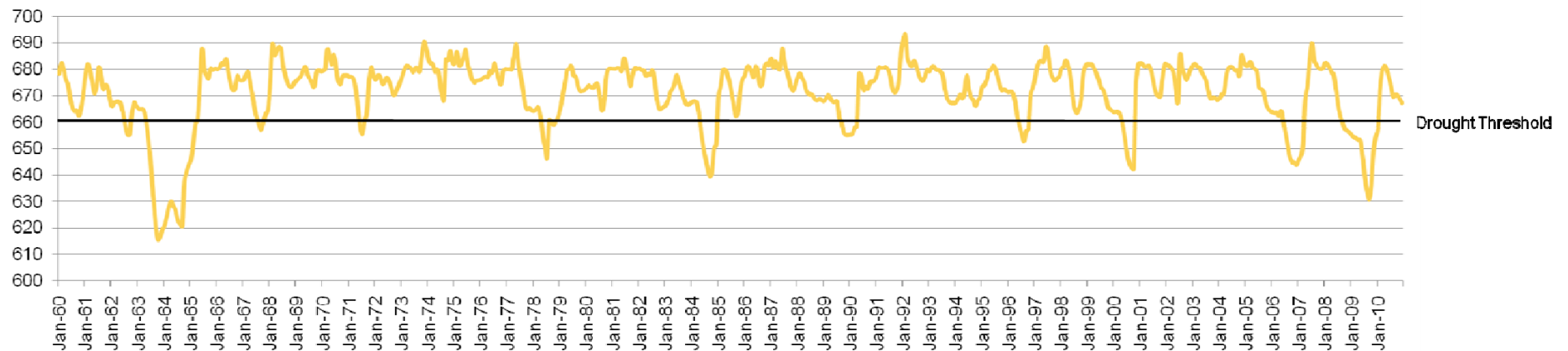


SOURCE: LCRA

Lake Travis experiences stable lake levels when water elevation is between 660 and 681 feet above sea level. As lake levels begin to fall below 660, visitation and recreation begin to decrease, but the lake still receives significant economic impacts from lake-related visitation. At lake levels below 650 feet, visitation sharply declines, driven by the closure of most of the lake’s boat ramps as well as media attention that highlights safety and accessibility issues, perceived or real, at Lake Travis.

Since 1960, there have been seven periods when Lake Levels dropped below 660 feet for more than five straight months. The most drastic of these droughts occurred between 1963 and 1965, when lake levels dropped below 660 feet for over 23 months and reached a minimum monthly average level of 615. The second most severe drought came in 2008 and 2009, as the average annual lake level was 647 feet above sea level, well below full pool and the average over the last 50 years. This drought lasted 17 months and lake levels reached a minimum of 630 feet above sea level. Figure 13 shows monthly average lake elevations over this 50-year period.

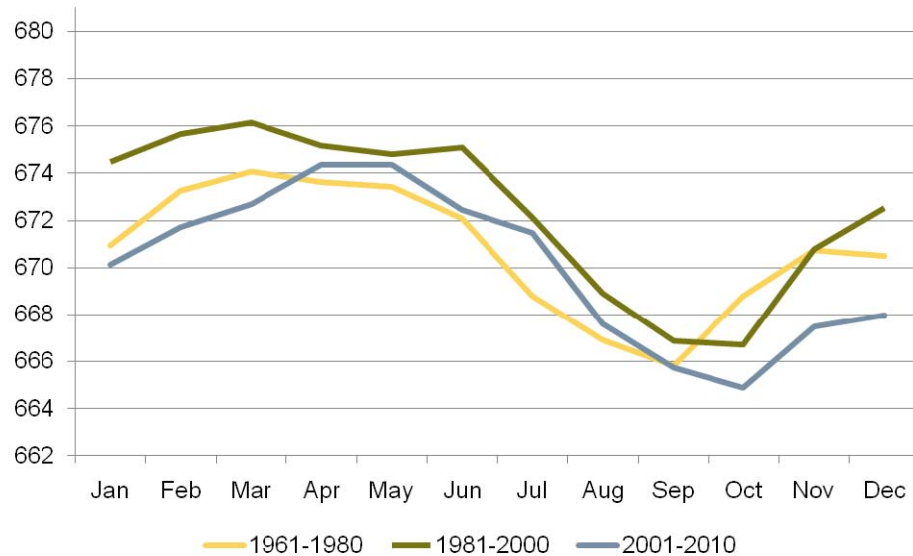
Figure 13: Average Monthly Lake Elevation (1960 – 2010)



SOURCE: LCRA

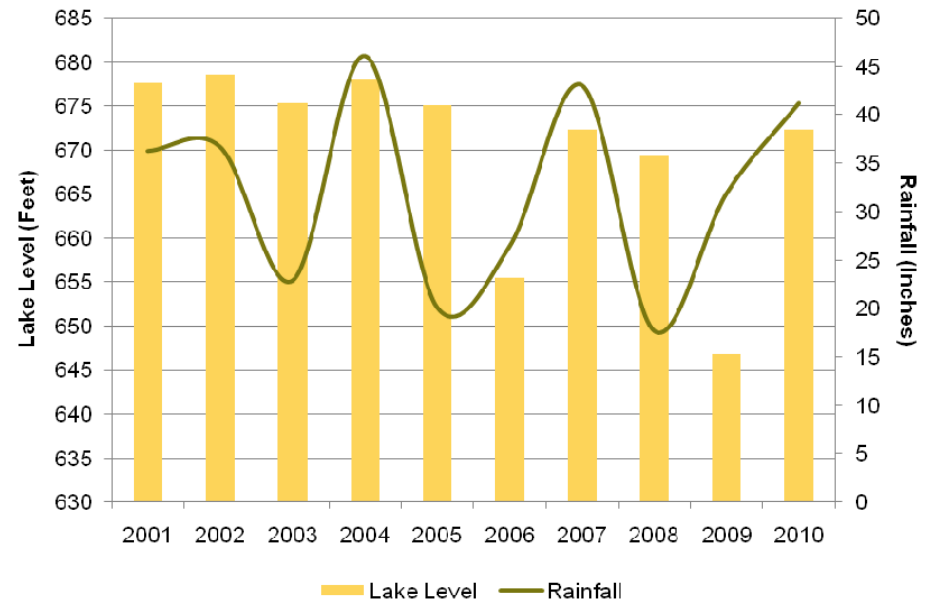
The bulk of visitation to Lake Travis occurs from late-May or early-June to through late-August or early-September. From 1961 to 1980, lake levels averaged 670.75 feet above sea level, peaked in March, and experienced their lowest levels in September. The time period between 1981 and 2000 had a better experience in terms of lake levels, averaging 672.44. Water levels peaked in March, didn't begin dropping until July, and eventually bottomed-out in October. The past decade, however, has experienced much different trends; water levels averaged 670.07, peaked in May, and continued decreasing through October. This data show that the last decade has been the least favorable time period in terms of water levels and has had a significant impact on Lake Travis.

Figure 14: Monthly Average Lake Elevation (1960 – 2010)



SOURCE: LCRA

Figure 15: Average Annual Lake Elevation and Total Annual Rainfall (2001 – 2010)



SOURCE: LCRA; U.S. Army Corps of Engineers

Figure 14 compares average annual water elevations to the amount of annual rainfall measured at Travis/Marshall Ford, and shows a clear relationship between drought years and lake low water levels. Annual rainfall at Lake Travis has averaged 32.2 inches between 2001 and 2010, and the lake typically experienced the most rainfall in June. Rainfall over this time period has fluctuated from as low as 17.7 inches to 46.0 inches; however, below average rainfall has not always coincided with low lake levels.

III. STUDY FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The Lake Travis impacts study begins with an assessment of the base case, which measures the fiscal and economic impacts associated with Lake Travis in 2010. The fiscal impact analysis estimates the current streams of revenues (property tax, sales tax, and other sources of revenue) that accrue to the State, County, and local jurisdictions as a result of development and spending on the lake. The economic impact analysis estimates the lake-related spending within the Study Area and the total economic impact of that spending. The economic impact analysis quantifies the multiplier effect of spending on both jobs and total spending within Travis County.

The base case analysis, which is the focus of this section, provides a snapshot estimate for fiscal and economic impacts related to Lake Travis in 2010. The base case is the most current estimate of impacts available and also serves as a benchmark against which prior years' economic and fiscal impact estimates will be measured. Furthermore, 2010 was an average lake-level year, therefore spending and fiscal impacts were not skewed by extreme droughts or floods. It is important to note that the economy was depressed during the base case year, a factor which is discussed and analyzed in the lake level section.

A. Fiscal Impact – Base Case

RCLCO conducted a detailed fiscal impact analysis of the largest fiscal impact generators within the Lake Travis Study Area, including property taxes, sales taxes, hotel occupancy fees, home rental revenue taxes, and mixed beverage taxes. When possible, the analysis attributes the fiscal impacts to the entities and jurisdictions that receive the revenues associated with the tax. The fiscal impact analysis only considers revenues; therefore, the results in this report do not reflect the effects of capital costs. Municipal and county expenses are not included in this analysis because costs associated with Lake Travis are not clearly delineated, and because expenses fluctuate based on budget appropriations, local priorities, and other causes that are not tied to the lake. The analysis has been conducted in constant 2010 dollars and does not take account of any inflation.

Property Taxes

In 2010, there were 37,885 parcels of land within the Lake Travis Study Area that paid property taxes to 43 taxing entities. The Study Area parcels comprised approximately 10 percent of the 392,863 parcels in the Travis County. The property tax analysis provides an estimate for the total assessed value of property within the Study Area, the annual property tax revenue generated for each taxing entity within the Study Area, and the value premium associated with views of and proximity to Lake Travis. RCLCO's analysis addresses the following questions:

- What is the total assessed value of parcels within the Study Area during the base year (2010)?
- What is the assessed value by land use for parcels within the Study Area during the base year (2010)?
- What is the premium associated with homes that are lake front, lake cove, and lake view (lake-related homes) within the Study Area?
- What is the premium for land that is lake front, lake cove, and lake view within the Study Area?
- What was the property tax revenue by land use for parcels within the study area during the base year (2010)?
- How much revenue from property taxes within the study area did each of the taxing entities receive in the base year (2010)?

Travis Central Appraisal District determines the value of all taxable property within its jurisdiction. Assessed value reflects the value of the land and real property upon the land. Property taxes are levied on each parcel and reflect assessed values, exemptions, and the 2010 property tax rate for each entity. The total assessed value of all of the parcels in the study area in 2010 was \$8.4 billion, which is comprised of \$5.0 billion in improvement value⁷ and \$3.4 billion in land value. The total property tax charges for the parcels in the Study Area for 2010 were \$158.4 million.

This analysis considers the total assessed values for the following land uses:

- Residential lake-front parcels
- Residential lake-cove
- Residential lake-view
- All other primary residential parcels
- Non-primary residential parcels (second homes and rental homes)
- Retail
- Marinas
- All other Commercial
- Lake-front, lake-cove, or lake-view land
- All other land

Figure 16 illustrates the how the \$8.4 billion in total assessed value was distributed among the various land use types in the Study Area in 2010.

¹ Improvement values reflect the assessed value of improvements to land, defined as immovable man-made objects, such as buildings.

Figure 16: Lake Travis Study Area Assessed Values by Land Use (2010)

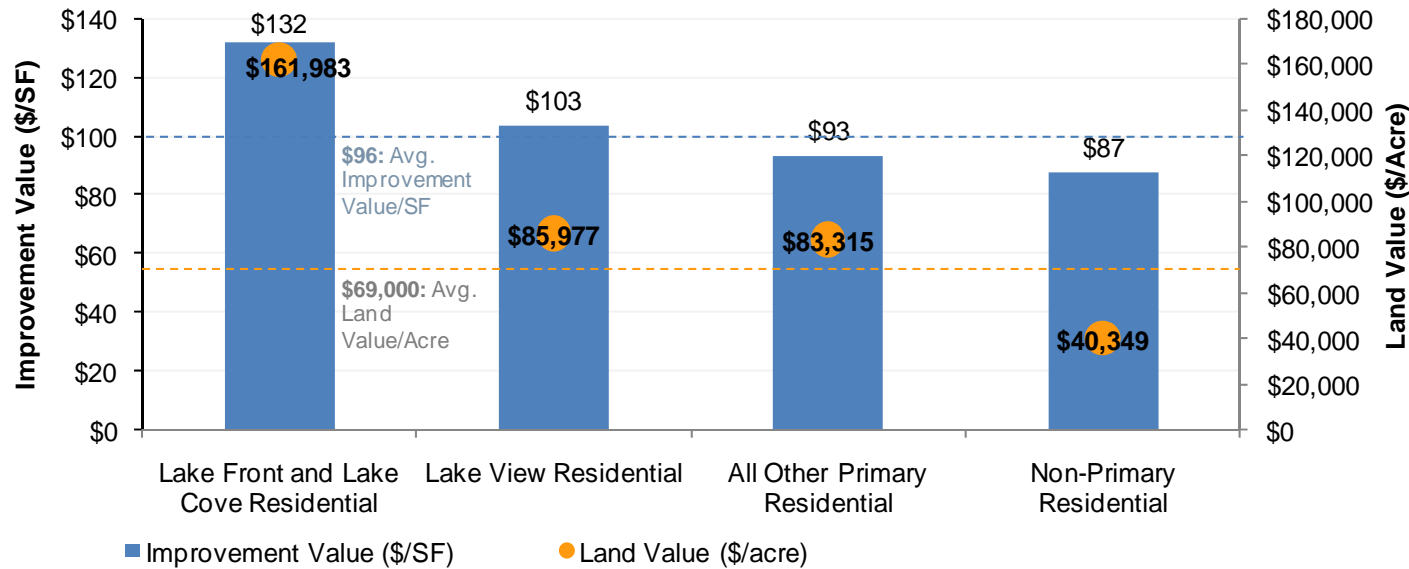
	Parcel Count	% of Total Parcels	Assessed Value (000s)	% of Total Value
Lake Front and Lake Cove Residential	1,378	4%	\$1,019,680	12.1%
Lake View Residential	727	2%	\$258,159	3.1%
All Other Primary Residential	11,981	32%	\$3,676,671	43.7%
Second Home Residential	5,264	14%	\$1,760,642	20.9%
Retail	119	0%	\$137,155	1.6%
Marina	367	1%	\$31,033	0.4%
Other Commercial	267	1%	\$218,008	2.6%
Vacant Land - Lake Front/Cove/View	2,310	6%	\$456,873	5.4%
Vacant Land - not Lake Front/Cove/View	15,472	41%	\$853,669	10.1%
TOTAL	37,885	100%	8,411,889	100%

SOURCE: Travis Central Appraisal District

Assessed Value

As reported by the Travis Central Appraisal District, the majority (81 percent) of total property tax assessments in the study area are from 19,350 residential parcels, which have a total assessed value of \$6.72 billion. Lake-related primary-residence homes consist of 2,105 parcels that have a total assessed value of \$2.3 billion. The 11,981 primary residential parcels that are neither lake-front, lake-view, nor lake-cove represent 62 percent of residential parcels in the study area and have a total assessed value of \$3.7 billion. The Study Area also includes 5,264 non-primary residential properties, which are comprised of second homes and rental homes and have a total assessed value of \$1.8 billion.

Figure 17: Residential Assessed Values within Study Area



SOURCE: Travis Central Appraisal District

Lake-front and lake-cove parcels are assessed at a premium to other residential parcels in the Study Area. Both land and improvement values are higher on a per-acre and per-square foot basis, respectively, for properties nearer to the lake, and the premium is higher for land. A higher land premium reflects that the location drives value more than the structure, and the improvement value premium indicates that residences that are lake-related have higher values on average than residences in the Study Area.

The average improvement value per square foot of living area in the Study Area is \$96. Lake-front and lake-cove parcels have an average improvement value per square foot of \$132. This represents a 38 percent premium for lake-front and lake-cove homes. Lake-related homes are typically larger and newer than the average home in the Study Area, which contributes to their higher improvement values. Lake-front homes, which are typically 3,186 square feet, are 620 square feet larger than the average residential property in the Study Area.

The average land value per acre for all residential parcels in the Study Area was \$69,000 in 2010. Lake-front and lake-cove parcels have an average land value per acre of \$162,000, which indicates a 134 percent premium for lake-front and lake-cove land. Although stakeholder interviews suggest that lake-cove parcels have lower values than lake-front parcels, which is attributed to the coves being shallow and losing their access to the lake when water levels

drop, for the purposes of this study, parcels that are both lake-front and lake-cove have been classified as lake-front since the designation of lake-cove and lake-front are not consistently applied across the Study Area.

The commercial assessment includes a total of 753 parcels, which includes all of the commercial parcels within the Study Area as well as additional commercial properties along Ranch Road 620. Figure 16 illustrates the commercial properties included in the analysis. The total assessed value for commercial properties within the Study Area is \$386.2 million, which represents only 4.3 percent of the total assessed value within the Study Area.

Over 12,800 acres of land remain undeveloped within the Study Area, of which 10,000 acres are lake-front, lake-cove, or lake-view. Land values per acre for lake-oriented parcels are \$46,000, as compared to \$292,000 per acre for non-lake related parcels. Land value analysis for the residential properties indicated that lake-oriented land is priced at a premium to other land in the Study Area, and there are several reasons why lake oriented vacant parcels do not enjoy the same premium on land as lake-oriented residential parcels. First, at 4.3 acres per parcel, the undeveloped lake-oriented parcels are significantly larger than the average non-lake oriented vacant parcel (0.2 acres) and the lake-oriented residential parcels (2.1 acres on average). The lake-oriented undeveloped parcels may only have a small sliver of land that is lake-front or has a lake view, with the remainder of the land not lake-oriented. The non-lakefront undeveloped parcels are large in number but very small (15,500 parcels, average size of 0.2 acres). This suggests that the non-lakefront parcels are subdivided lots, which likely have services and infrastructure which drive up the land value. The lake-oriented undeveloped parcels are most similar to the non-primary residential parcels both in terms of land values and size.

Figure 18 summarizes 2010 market and assessed values for residential, commercial, and land parcels located within the Lake Travis Study Area.

Figure 18: Summary of Assessed Parcels Located within the Lake Travis Study Area

	Parcel Count	% of Total Parcels	Total Living Area	Average Living Area	Land Acres		Improvement Market Value (000s)			Land Market Value (000s)			Total Assessed Value (000s)	
					Total	Average	Total	Average	Value/SF	Total	Average	Value/Acre	Total	Average
Residential														
Lake Front and Lake Cove Residential	1,378	4%	4,357,162	3,162	3,262	2.4	\$574,561	\$417	\$0.13	\$528,362	\$383	\$162	\$1,019,680	\$740
Lake View Residential	727	2%	1,912,243	2,630	759	1.0	\$197,839	\$272	\$0.10	\$65,290	\$90	\$86	\$258,159	\$355
All Other Primary Residential	11,981	32%	30,736,763	2,565	10,515	0.9	\$2,865,407	\$239	\$0.09	\$876,087	\$73	\$83	\$3,676,671	\$307
Non-Primary Residential	5,264	14%	12,657,827	2,405	16,207	3.1	\$1,106,718	\$210	\$0.09	\$653,924	\$124	\$40	\$1,760,642	\$334
Residential Subtotal	19,350	51%	49,663,995	2,567	30,743	1.6	\$4,744,525	\$245	\$0.10	\$2,123,663	\$110	\$69	\$6,715,151	\$347
												134%		
Commercial														
Retail	119	0%	1,400,984	11,773	508	4.3	\$86,326	\$725	\$0.06	\$50,829	\$427	\$100	\$137,155	\$1,153
Marina	367	1%	7	0.02	523	1.4	\$2,731	\$7	N/A	\$10,038	\$27	\$19	\$31,033	\$85
Other Commercial	267	1%	3,164,839	11,853	1,807	6.8	\$152,281	\$570	\$0.05	\$65,727	\$246	\$36	\$218,008	\$817
Commercial Subtotal	753	2%	4,565,830	6,064	2,837	3.8	\$241,338	\$321	\$0.05	\$126,594	\$168	\$45	\$386,196	\$513
Land														
Vacant Land - Lake Front/Cove/View	2,310	6%	71	0	9,961	4.3	N/A	N/A	N/A	\$448,041	\$194	\$45	\$456,873	\$198
Vacant Land - not Lake Front/Cove/View	15,472	41%	241	0	2,919	0.2	N/A	N/A	N/A	\$749,329	\$48	\$257	\$853,669	\$55
Land Subtotal	17,782	47%	312	0	12,880	0.7	N/A	N/A	N/A	\$1,197,371	\$67	\$93	\$1,310,541	\$74
TOTAL	37,885		54,230,137	1,431	46,460	1.2	\$4,985,863	\$248	\$0.09	\$3,447,628	\$91	\$80	\$8,411,889	\$222

SOURCE: Travis Central Appraisal District

Property Tax Revenues

In 2010, over \$158.4 million in property taxes were collected from parcels located within the Lake Travis Study Area. Property tax payments are based on the assessed value of property, tax exemptions, and the 2010 property tax rate for each taxing entity within the Study Area. There are 43 taxing entities within the Study Area. Taxing entities have overlapping boundaries; therefore, many parcels pay property taxes to more than one taxing entity. Lake Travis ISD and Travis County together collect over half of all of the property taxes generated within the Lake Travis Study Area. Figure 19 illustrates the total property tax payment to each taxing entity by land use in 2010.

Figure 19: Summary of Property Tax Collections by Taxing Entity for the Lake Travis Study Area (2010)

	Residential	Commercial	Land	Total	% of Total
Lake Travis ISD	\$39,605,508	\$3,078,470	\$6,092,306	\$48,776,284	31%
Travis County	\$25,387,703	\$1,672,721	\$4,844,352	\$31,904,776	20%
Leander ISD	\$19,168,928	\$1,300,560	\$2,483,666	\$22,953,154	14%
Lago Vista ISD	\$9,494,338	\$410,960	\$3,434,865	\$13,340,164	8%
Marble Falls ISD	\$4,732,283	\$12,102	\$1,531,148	\$6,275,533	4%
Travis County Healthcare District	\$3,918,797	\$258,198	\$747,765	\$4,924,760	3%
Travis County ESD 6	\$3,379,752	\$211,575	\$328,995	\$3,920,322	2%
City of Lakeway	\$3,132,860	\$243,959	\$308,572	\$3,685,391	2%
City of Lago Vista	\$2,553,246	\$164,544	\$729,076	\$3,446,866	2%
Lakeway MUD	\$1,692,451	\$87,544	\$43,565	\$1,823,560	1%
City of Jonestown	\$1,277,550	\$27,252	\$484,360	\$1,789,163	1%
Hurst Creek MUD	\$1,658,751	\$34,668	\$35,916	\$1,729,336	1%
Travis County ESD 1	\$1,262,593	\$43,068	\$346,252	\$1,651,913	1%
Austin Community College District	\$1,272,484	\$85,017	\$162,460	\$1,519,961	1%
Travis County ESD 8	\$963,798	\$32,648	\$260,426	\$1,256,873	1%
Wmsn-Tr Co WCID 1G	\$1,230,098	\$0	\$6,351	\$1,236,449	1%
Wmsn-Tr Co WCID No 1D	\$995,505	\$0	\$10,455	\$1,005,959	1%
Travis County ESD 14	\$833,917	\$32,313	\$75,293	\$941,523	1%
City of Austin	\$711,625	\$149,409	\$80,447	\$941,480	1%
WCID No 17	\$671,874	\$58,322	\$103,174	\$833,370	1%
Travis County MUD No 11	\$344,638	\$0	\$363,100	\$707,738	0%
WCID 17 Flintrock (Da)	\$599,553	\$0	\$80,473	\$680,027	0%
Travis County MUD No 10	\$402,450	\$0	\$191,851	\$594,301	0%
WCID Point Venture	\$534,379	\$2,069	\$52,041	\$588,490	0%
Bella Vista MUD	\$505,957	\$0	\$1,448	\$507,404	0%
Wmsn-Tr County WCID No 1F	\$288,827	\$0	\$141,731	\$430,558	0%
Williamson/Travis MUD No 1	\$201,144	\$0	\$66	\$201,211	0%
Village of Volente	\$155,850	\$6,693	\$29,184	\$191,726	0%
Village of Briarcliff	\$172,145	\$2,748	\$14,109	\$189,002	0%
Village of Point Venture	\$136,867	\$515	\$13,127	\$150,510	0%
Village of The Hills	\$121,782	\$5	\$2,592	\$124,380	0%
City of Bee Cave	\$41,034	\$7,176	\$7,170	\$55,379	0%
City of Cedar Park	\$8,516	\$9,193	\$21,484	\$39,193	0%
Other	\$7,585	\$0	\$4,373	\$11,958	0%
TOTAL	\$127,464,788	\$7,931,730	\$23,032,193	\$158,428,712	100%

Sales Taxes

In 2010, over \$45.2 million in sales tax revenues were collected from businesses located within the Lake Travis Study Area and along Ranch Road 620. Approximately \$5.3 million in sales tax revenues were collected by the towns, cities, and unincorporated areas within the Study Area. In the same year, the State of Texas collected \$34.3 million in sales tax revenues from businesses in and adjacent to the Study Area, and other local taxing entities received an estimated \$5.7 million in sales tax revenues. Figure 20 illustrates the location of the businesses that contributed to the sales tax analysis. Figure 21 illustrates 2010 sales tax collections for businesses located within the Study Area.

Figure 20: Businesses Located within the Lake Travis Study Area

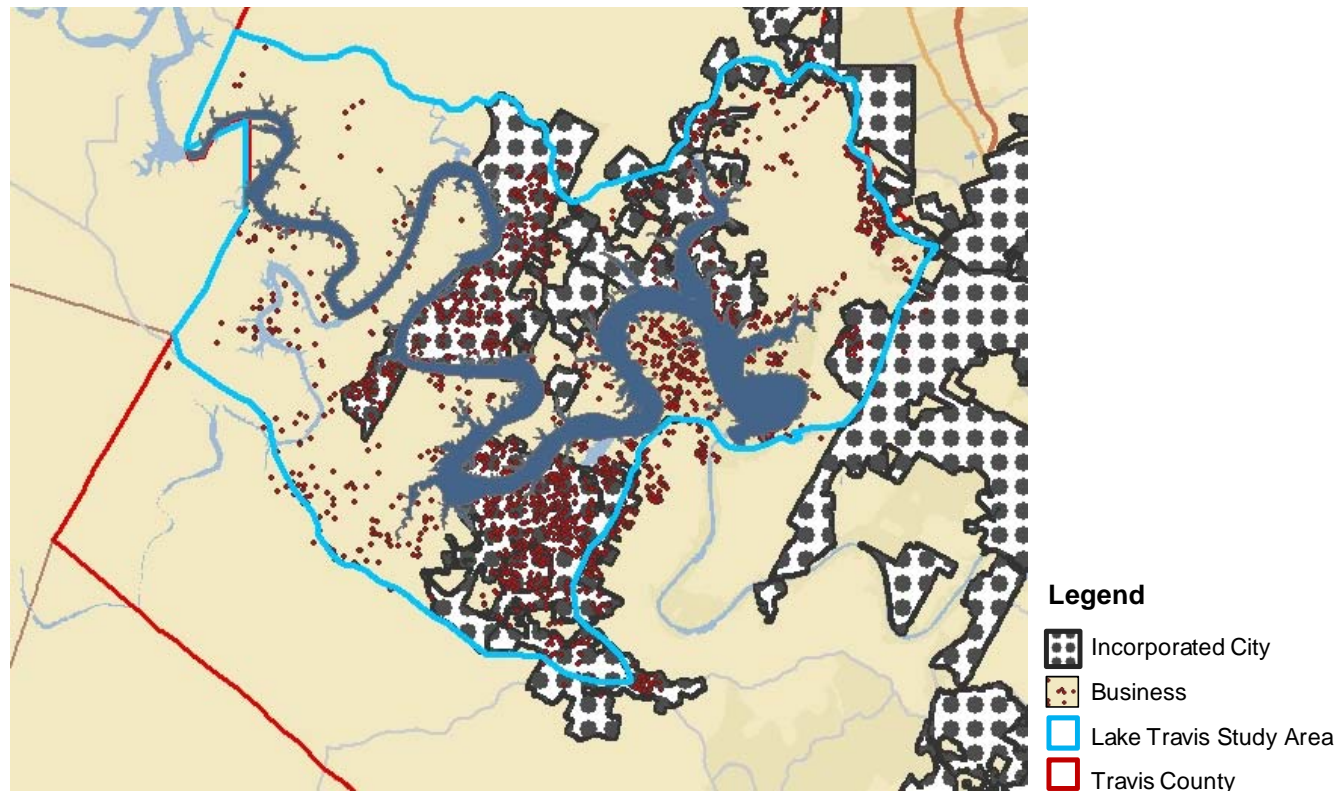
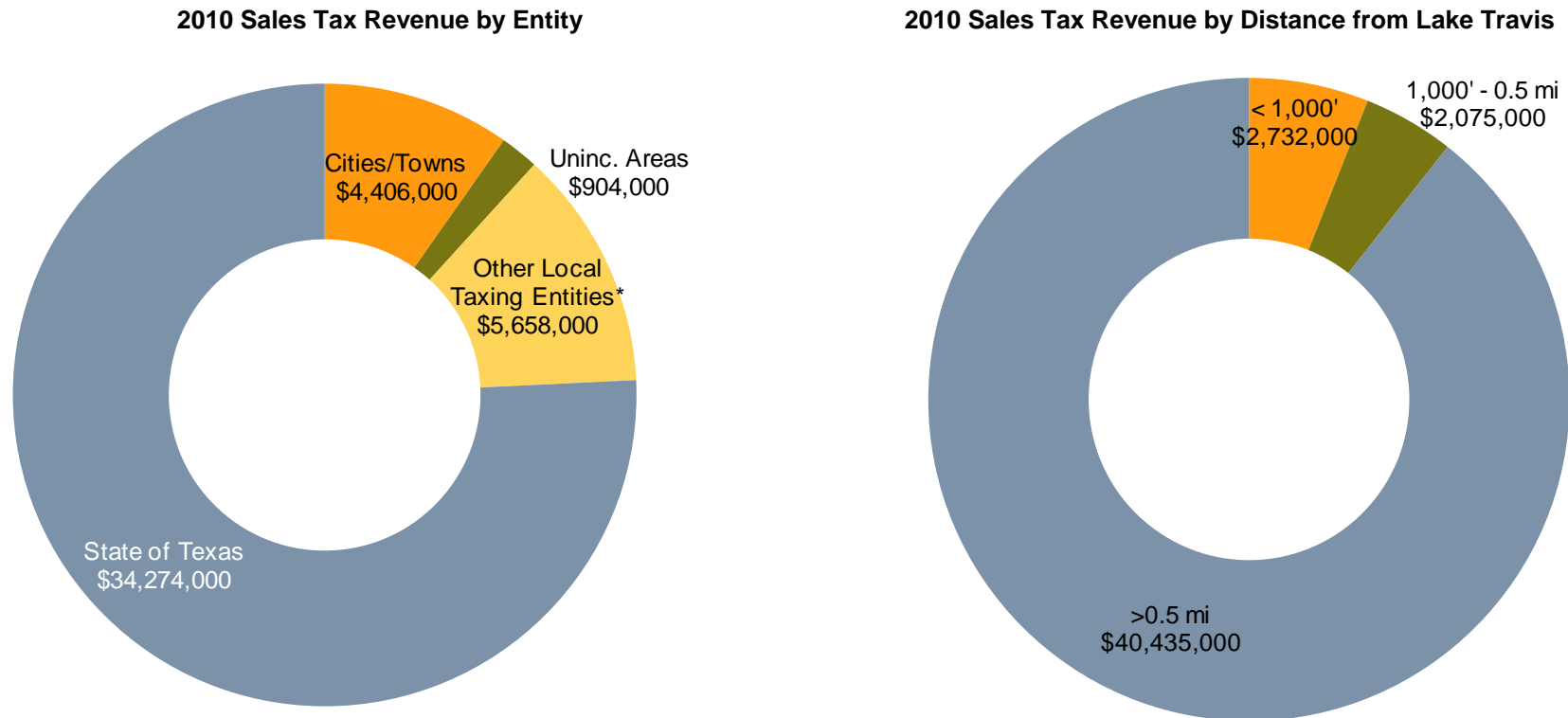


Figure 21: Summary of Sales Tax Revenues for Businesses Located within the Study Area (2010)



* Other local taxing entities include the county, SPDs, and transit authorities

Source: Texas Comptroller Office, RCLCO

In Texas, sales taxes are imposed by the State and four local taxing entities: counties, cities, special purpose districts (SPDs), and transit authorities. City sales tax jurisdictional boundaries cannot overlap one another. However, different types of taxing entities may cross or share boundaries, and boundaries for transit authorities and special purpose districts frequently encompass several cities and/or counties. A state sales and use tax of 6.25 percent is imposed on all retail sales, leases and rentals of most goods, as well as taxable services. Local taxing entities have the option of imposing additional local sales taxes, the sum of which cannot exceed two percent. Therefore, the combined state and local sales tax levy for a business can range from 6.25

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percent to 8.25 percent. All sales taxes are collected by the State Comptroller office. State sales tax collections become part of the general fund, and the Comptroller's office redistributes local sales tax collections to the appropriate local taxing entities.

State law requires that cities are the first of all local taxing entities to levy sales or use tax. If the sales tax cap is not reached by the city levy, other local government entities can participate in tax collection up to the capped rate. For the purposes of this analysis, RCLCO uses the 2010 local sales tax rate for each city in the Study Area, and assumes that other local taxing entities impose an additional tax (up to a total local sales tax of two percent). Therefore, the analysis assumes that all businesses in the study area pay 8.25 percent in sales taxes.

Of the ten cities and towns that collect sales taxes within the study Area, three cities received the largest amount of sales tax revenue. Austin, Lakeway, and Briarcliff each collected over \$1 million in sales tax revenues in 2010. Figure 22 illustrates the total sales tax collections in 2010 from the businesses located within the Study Area.

Figure 22: Sales Tax Revenues by Taxing Entity for Businesses Located within the Study Area (2010)

Business Location	City/Town/	Other		
	Uninc. Sales Tax Revenue	Local Sales Tax Revenue	State Sales Tax Revenue	Total Sales Tax Revenue
Austin	\$1,071,199	\$1,071,199	\$6,694,994	\$8,837,393
Bee Cave	\$26,301	\$0	\$82,190	\$108,491
Briarcliff	\$1,768,837	\$1,768,837	\$11,055,234	\$14,592,909
Cedar Park	\$122,432	\$0	\$382,601	\$505,033
Jonestown	\$55,422	\$55,422	\$346,387	\$457,231
Lago Vista	\$144,722	\$144,722	\$904,511	\$1,193,954
Lakeway	\$1,160,050	\$165,721	\$4,143,034	\$5,468,805
Point Venture	\$18,219	\$18,219	\$113,866	\$150,304
Village of the Hills	\$7,641	\$12,736	\$63,679	\$84,056
Volente	\$30,842	\$30,842	\$192,760	\$254,443
Unincorporated Area	\$904,148	\$2,390,163	\$10,294,721	\$13,589,031
Total	\$5,309,812	\$5,657,860	\$34,273,977	\$45,241,650

The retailers and other businesses in the Lake Travis Study Area have varying degrees of dependency on the lake, ranging from the water recreation stores on the lake, which are highly lake dependent, to hair salons, clothing stores, and other goods and service retailers that cater to local residents and whose revenues are not directly tied to lake activities (though it could be argued that a portion of the local residents would not reside in the area if not for the presence of Lake Travis). In an attempt to isolate those businesses that likely experience sales as a result of their direct proximity to Lake Travis, RCLCO considered the sales tax revenues of businesses that are on the lake (located within 1,000 feet of the lake), near the lake (located between 1000 feet and half a mile from the lake), and further from the lake (located within the Study Area and greater than half a mile from the lake). Approximately 89 percent of the sales tax in the Study Area is collected from businesses located further from the lake, which does not necessarily mean their sales are not supported by lake-driven activities, but that they are businesses with high visibility along major highways that accommodate local traffic in addition to visitors to Lake Travis. Businesses located within half a mile of the lake, which are likely driven largely by lake-related activities, generated \$4.8 million in sales tax revenues in 2010.

Hotel Occupancy Tax

In 2010, there were six hotels in the Study Area that had a total of almost 470 rooms. These hotels range from two-room bed-and-breakfasts to 239-room resorts, and are concentrated in Lakeway and Austin on the western edge of the Study Area. The hotels were built between 1960 and 2008, and the average rate for a hotel room in the Study Area is approximately \$170 per night, according to current and recent advertised rates. The following hotels are located within the Study Area and serve the Lake Travis market:

- Lakeway Resort and Spa is the largest of the Lake Travis hotels and has 239 rooms. This hotel is located in the City of Lakeway, and is situated directly on the lake. It features a wide array of lake-related amenities, such as a spa, sailing, fishing, and access to the Lakeway Marina.
- Hampton Inn & Suites is the newest hotel in the Study Area and contains 70 rooms. This hotel is also located in Lakeway, but is located three miles south of the lake along Ranch Road 620.
- Vintage Villas is a 44-room hotel in Austin located directly on the lake. This hotel specializes in wedding ceremonies and receptions. An estimated 200 weddings take place at Vintage Villas each year.
- Mountain Star Lodge, located in Austin along Ranch Road 620, is a bed-and-breakfast hotel with 40 rooms and suites.
- The Crossing, which is now known as Traavasa, is a 70 unit wellness resort and spa located just a short drive from Lake Travis along Farm-to-Market Road 2769. This hotel has recently undergone renovations and is focused on providing an eco-friendly resort alternative in the Balcones Canyonland Preserve.

The Study Area also contains two small bed-and-breakfasts, Robin's Nest and Serenity at Lake Travis, which both contain two rooms and are located in Austin.

According to data provided by the Texas Comptroller, the 466 hotel rooms in the Study Area generated \$10.6 million dollars in taxable receipts. The Lakeway Resort and Spa accounts for the overwhelming majority of these revenues, collecting over \$6.7 million in taxable receipts in 2010.

The State imposes a hotel occupancy tax of six percent on all hotel room rentals that cost \$15 or more. All hotel rooms in the Lake Travis Study Area are subject to the hotel occupancy tax. In 2010, the State of Texas collected \$633,000 in hotel occupancy tax from hotels located in the Lake Travis Study Area.

Some local taxing authorities are authorized by the State to impose an additional local hotel occupancy tax. The only local authority that contains hotels and imposes a local hotel occupancy tax is the city of Austin, which charges an additional nine percent local hotel occupancy tax to all hotels located within the city limits. The hotel occupancy tax collected by the City of Austin is distributed to the following funds: Tourism and Promotion Fund, Convention Center Tax Fund, Cultural Arts Fund, and Venue Project Fund. The hotels in the Study Area generated \$842,000 in hotel occupancy taxes in 2010.

Vacation Rentals

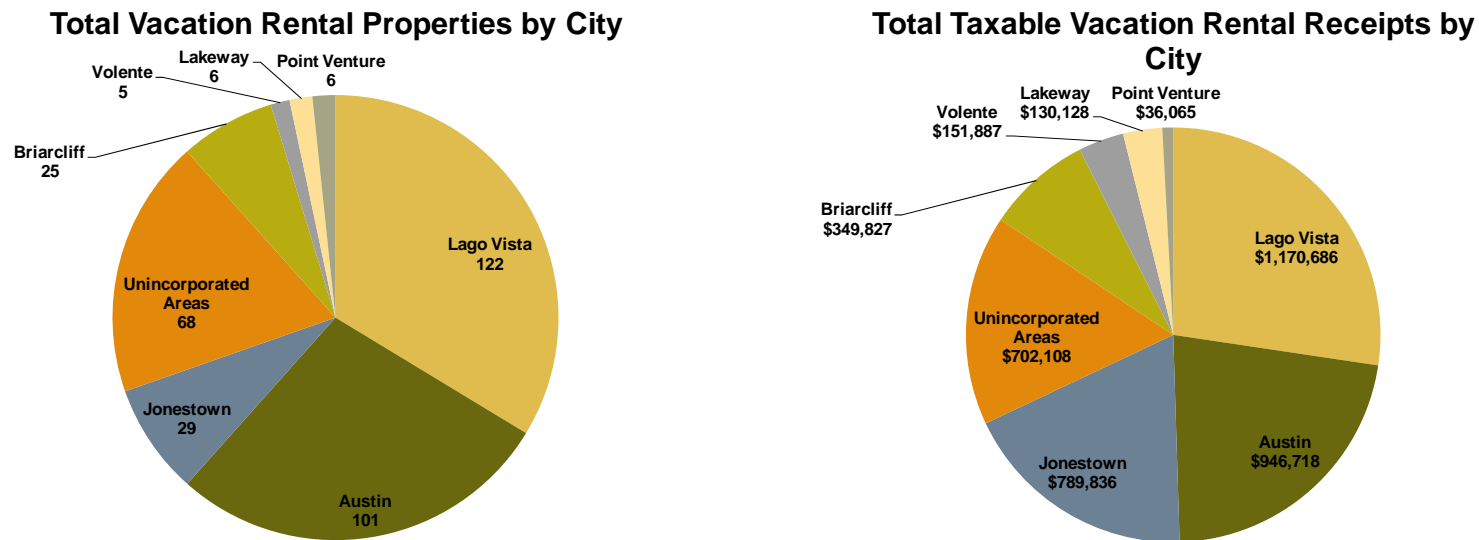
The Lake Travis hospitality market is largely comprised of vacation home rentals. Vacation rentals are a common alternative to hotels in waterfront communities and create income for local families during summer months. According to the Texas Comptroller data, Lake Travis Study Area contains approximately 362 private homes and condominiums that receive revenue as vacation properties. These private vacation residences are subject to the same hotel occupancy taxes as hotels, which are collected from the property owners or a management company.

The average daily rate for home rentals is higher than hotels; however, the occupancy rate is significantly lower due to extreme seasonality of home rentals. The Lake Travis rental properties charge approximately \$300 per night and \$1,800 per week. According to interviews with vacation rental management companies, including The Island at Lake Travis and Austin Lakeside, the peak home rental season is from the end May to the beginning of September. Total taxable receipts from home rentals was \$4.28 million dollars in 2010, which suggests that each home was rented for an average of 29 days. It is important to note that homes are not available year-round as their owners will occupy them as their second homes for a portion of the year, or as their primary home for the majority of the year. The most popular vacation rentals are those located directly on the lake in deep channels with either private boat docks or access to a public boat ramp or private marina.

The vacation rental properties in the Study Area are more dispersed than the hotels and are concentrated near the lake, as lake activities are the primary driver of rental demand in the area. Of the 362 properties in the vacation rental market in the Study Area in 2010, 122 were located in Lago Vista, 101 were in Austin, and 29 were in Jonestown. The properties in these jurisdictions collected 70 percent of total taxable receipts from vacation rentals in the Study Area, with Lago Vista collecting the most, \$1.17 million, and Austin collecting \$946,700 (Figure 23). The remaining 30 percent of receipts were collected from rentals located in Briarcliff, Volente, Lakeway, Point Venture, and Unincorporated Areas of the Study Area.

This fiscal impact of the vacation rental properties in the Lake Travis Study Area equates to a total of \$470,000, of which \$256,600 is collected by the state of Texas and represents six percent of all Study Area taxable hotel receipts. Additionally, the cities of Austin, Jonestown, and Lago Vista impose a local hotel occupancy tax. The impact of the local hotel tax on vacation rentals located within the Study Area is \$85,200 (nine percent tax) in Austin, \$55,300 (seven percent) in Jonestown, and \$70,200 (six percent) in Lago Vista. The other jurisdictions in the Study Area do not impose additional hotel occupancy taxes and do not receive tax revenues from the rental of these properties.

Figure 23: Vacation Rentals by City (2010)



SOURCE: Texas Comptroller

Mixed Beverage Tax

The Mixed Beverage Tax is a 14 percent levy imposed on the amount received from the sale or service of mixed beverages or nonalcoholic beverages that are prepared or served to be combined with alcoholic beverages. The mixed beverage tax receipts are collected by the State of Texas and are

distributed as follows to local entities: local jurisdictions receive 10.7 percent of the tax, the county receives 10.7 percent of the tax, and the state receives the remaining 78.6 percent of the tax.

In 2010, over 600 businesses in the Lake Travis Study Area collected revenues totaling \$16.3 million from the sale of mixed beverages and were taxed accordingly. The portion of Austin located within the Study Area accounted for the majority of the Study Area's taxable mixed beverage receipts, as the 221 mixed beverage licenses in this area collected \$9.3 million in revenues from the sale of alcoholic beverages. Lakeway, the second largest recipient of mixed beverage receipts, collected over \$4.4 million, or 27 percent of total receipts in the Study Area, from 182 businesses. The fiscal impact of the Mixed Beverage Tax was \$245,200 to the local jurisdictions, \$245,200 to Travis County, and \$1.80 million to the state of Texas.

Figure 24: Total Taxable Mixed Beverage Receipts by City (2010)

JURISDICTION	TAXABLE RECEIPTS	LOCAL TAXES	COUNTY TAXES	STATE TAXES
Austin	\$9,306,723	\$139,601	\$139,601	\$1,023,739
Lakeway	\$4,427,142	\$66,407	\$66,407	\$486,985
Unincorporated Areas	\$1,449,476	\$21,742	\$21,742	\$159,442
Lago Vista	\$671,696	\$10,075	\$10,075	\$73,887
Cedar Park	\$412,035	\$6,181	\$6,181	\$45,324
Jonestown	\$78,942	\$1,184	\$1,184	\$8,684
Total	\$16,346,014	\$245,191	\$245,191	\$1,798,061

SOURCE: Texas Comptroller

Fiscal Impact Summary

The total fiscal impact within the Study Area in 2010 was an estimated \$207.2 million, as detailed in Figure 25. Over 66 percent of the tax revenues collected within the Study Area funded local taxing entities, which include municipalities, emergency service districts, school districts, utilities, and other special purpose districts. Property taxes make up almost 80 percent of all tax collections in the Study Area and are the largest source of tax revenue for most of the taxing entities.

Figure 25: Total Fiscal Impact by Jurisdiction (2010)

	City of Austin	Village of Briarcliff	City of Jonestown	City of Lago Vista	City of Lakeway	Village of Point Venture	Village of the Hills	Village of Volente	Other Local Taxing Entity	Travis County	State of Texas	Total
Property Tax												
Residential	\$711,625	\$172,145	\$1,277,550	\$2,553,246	\$3,132,860	\$136,867	\$121,782	\$155,850	\$93,815,160	\$25,387,703		\$127,464,788
Commercial	\$149,409	\$2,748	\$27,252	\$164,544	\$243,959	\$515	\$5	\$6,693	\$5,663,884	\$1,672,721		\$7,931,730
Land	\$80,447	\$14,109	\$484,360	\$729,076	\$308,572	\$13,127	\$2,592	\$29,184	\$16,526,374	\$4,844,352		\$23,032,193
Total Property Tax	\$941,480	\$189,002	\$1,789,163	\$3,446,866	\$3,685,391	\$150,510	\$124,380	\$191,726	\$116,005,418	\$31,904,776		\$158,428,712
Sales Tax												
2010	\$1,071,199	\$1,768,837	\$55,422	\$144,722	\$1,160,050	\$18,219	\$7,641	\$30,842	\$6,710,741		\$34,273,977	\$45,241,649
Hotel Occupancy Tax												
Hotels	\$209,500										\$633,000	\$842,500
Vacation Rentals	\$85,200		\$55,300	\$70,200					\$2,900		\$256,600	\$470,200
Total Hotel Occupancy Tax	\$294,700		\$55,300	\$70,200							\$889,600	\$1,309,800
Mixed Beverage Tax												
2010	\$139,601		\$1,184	\$10,075	\$66,407				\$27,923	\$245,191	\$1,798,061	\$2,288,442
TOTAL FISCAL IMPACT	\$2,446,981	\$1,957,840	\$1,901,069	\$3,671,864	\$4,911,848	\$168,728	\$132,021	\$222,568	\$122,472,853	\$32,149,966	\$36,961,638	\$207,246,861

B. Economic Impact – Base Case

The economic impact analysis traces the flow of spending through the Travis County regional economy and identifies changes in jobs, wages, and total output due to Lake Travis-related spending. Net economic impacts are most commonly defined as the incremental changes in measured economic activity resulting from an external (i.e. “outside”) injection of new spending into a specific region. Economic impacts are driven by direct spending or expenditures that would not occur but for the lake, and include visitor spending (boaters, park visitors, vacation renters, and second-home owners), capital expenditures by boat owners and boat dock owners/renters, and boat sales.

Economic impacts reflect direct and multiplier effects of spending related to visitor activity on Lake Travis. Multipliers are a numeric way of describing the secondary impacts stemming from a change. The economic impact of Lake Travis spending was estimated using IMPLAN (IMPact Analysis for PLANning), an econometric modeling system developed by applied economists at the University of Minnesota and the U.S. Forest Service. The IMPLAN modeling system has been in use since 1979 and is currently used by over 500 private consulting firms, university research centers, and government agencies. IMPLAN's Social Accounting Matrices were used to construct county-level multipliers which quantify the total effects of lake-related spending on the Travis County economy. There are three types of effects measured with a multiplier: the direct, the indirect, and the induced effects, which together equal the total economic impact. The direct effect is the known or predicted change in the local economy that is to be studied. The indirect effects are the

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business-to-business transactions required to satisfy the direct effect. Finally, the induced effect is derived from local spending on goods and services by people working to satisfy the direct and indirect effects.

Direct spending impacts measure the total economic impact of lake-related spending in the base year, 2010. This analysis defines lake-related spending as expenditures that would not occur but for the lake, and includes visitor spending (boaters, park visitors, vacation renters, and second-home owners), capital expenditures by boat owners and boat dock owners/renters, and boat sales. The majority of lake-related spending in the Study Area is visitor spending, making the economic impact analysis for Lake Travis most akin to a tourism economic impact study. Tourism economic impact analyses typically rely on annual visitor counts and visitor surveys that quantify spending, length of stay, and party size. Such data were not available for Lake Travis, therefore RCLCO made assumptions for the following data points, which are further detailed throughout the section:

- Visitor Counts – The analysis assumes that park visitors, hotel visitors, second-home renters, marina slip renters, and private boat dock owners comprise total visitation to Lake Travis. LCRA provided park visitation data. All other visitation estimates are based on assumptions that are detailed throughout this section.
- Visitor Spending – Visitor spending assumptions are based on multiple tourism economic impact studies for Travis County, Hill Country, Austin MSA, and boat recreation in the South. These studies provide estimates for daily visitor spending in a variety of categories – hospitality, transportation, food, recreation, and miscellaneous expenses. RCLCO adjusted spending per category per visitor type based on professional judgment.
 - Local versus Non-Local Park Visitors – Local visitors are projected to spend less per visitor day. A portion of the hotel visitors are non-local park visitors.
 - Boaters – Spending estimates per day vary depending upon the type of boat (power v. sail, greater or less than 40 feet). For the purposes of this analysis, we assume that the mix boats based on Travis County boat registration in 2010. ** FRAGMENT – PLEASE REVIEW **

NOTE: RCLCO strongly recommends that a formal survey of visitors to Lake Travis be conducted in order to better understand the demographics of Lake Travis visitors and to know where visitors are coming from, party size, how long they stay, where they stay, how much they spend, what they buy, and what Lake Travis and regional tourism service providers can do to make the visitor experience more enjoyable and encourage longer and more frequent visits.

Direct Spending Impacts

The following section summarizes the total economic impacts in 2010 of lake-related spending, which includes visitor spending (boaters, park visitors, vacation renters, and second-home owners), boat sales, and capital expenditures from marina slip renters and private dock owners. The spending by these visitor groups reflects new spending in the Study Area that would not occur but for the lake. This economic impact study captures Study Area

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residents' spending for lake-related activities, such as boating, marina rentals, etc., but does not include general spending by primary households and employees, which includes the purchase of cars, food, clothing, furniture, and other goods, which are driven by the lake.

Visitors and Visitor Spending Trends

Lake Travis is a large attraction and draws a variety of visitors to the area. For the purpose of this study, we have classified these visitors into four categories: park visitors, boaters, hotel and vacation renters, and second-home visitors. The park visitors are either local or non-local visitors that used the public park facilities that surround Lake Travis. Boaters are visitors to Lake Travis that either own a private boat stored in a marina or private boat dock or boat owners who transport their boats to Lake Travis. Hotel and Vacation Renters are visitors to the Lake Travis area that participated in lake related activities and occupied hotel rooms or rented vacation homes. The final group of visitors is owners of second homes in the area that use their property in the Lake Travis area as a vacation home or seasonal home.

RCLCO estimates 2.8 million visitor-days to Lake Travis in 2010. Visitation to Lake Travis public parks totaled over 491,900 visitor-days with 55 percent (266,289) coming from out of the area, and the remaining 45 percent (225,100) originating from the local area. Boater-days totaled 1.6 million, with 1.2 million coming from boats in marinas, 254,400 from private docks, and 150,000 from public boat ramps. Hotel and Vacation Renters totaled 173,157 visitor-days in 2010, with the overwhelming majority of them, 116,127, occupying hotel rooms as opposed to vacation homes. The final group of visitors, second-home owners, accounted for a total of 568,512 total visitor-days to the Lake Travis Study Area in 2010. This is a conservative estimate of visitor-days to Lake Travis based on all available visitor count information provided by LCRA, The City of Jonestown, and Travis County. However, comparative visitor counts for other Central Texas lakes, which are managed and surveyed annually by the Army Corps of Engineers, suggest that the visitation estimate for Lake Travis may be understated.

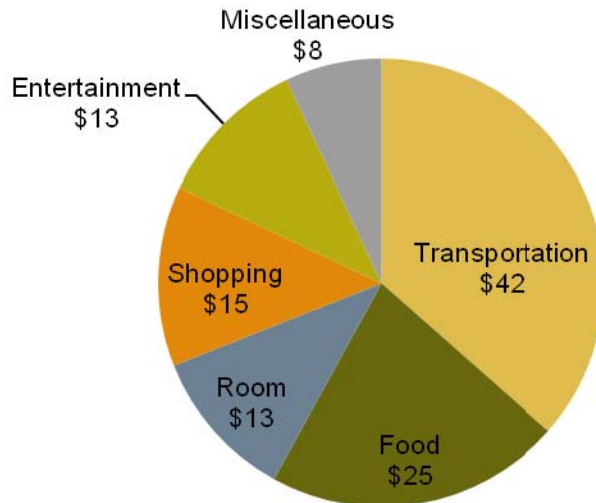
Figure 26: Total Visitor-Days by Visitor Type

VISITOR TYPE	VISITOR-DAYS
Park	491,343
Local	225,054
Non-Local	266,289
Hotel & Vacation Rentals	173,157
Hotel	116,127
Vacation Rentals	57,030
Second Home	568,512
Boaters	1,569,342
Marina	1,164,963
Private Boat Docks	254,388
Public Boat Ramps	149,992
TOTAL	2,802,355

Visitor spending brings dollars to the Study Area from outside; therefore, visitor spending generates economic impacts. Data regarding total visitation to and spending at Lake Travis does not exist, so to determine the impacts of visitor spending, RCLCO made assumptions based on data presented in travel and tourism studies of the Austin-Round Rock MSA and Texas.

According to the Texas 2009 Visitor Profile and the 2009 Hill County Region Destination Report, both by D.K. Shifflet and Associates, visitor spending in the Austin-Round Rock MSA and the state of Texas is estimated to be approximately \$115 per person per day, with the majority spent on transportation and food. The distribution of this spending is shown in Figure 27 below.

Figure 27: Total per Person per Day Expenditures by Spending Category (2010)



SOURCE: D.K. Shifflet and Associates

Although the overall average expenditure is estimated at \$115 per person per day, this expenditure only applies to one group of visitors involved in this study: non-local park visitors. Other visitor expenses are backed out of total spending per day on a case-by-case basis. For example, local park visitors have the lowest average daily spending of \$33, which includes a share of food and transportation costs typically spent per visitor day. Lodging expenses for visitors staying in Hotels and Vacation Rentals must also be adjusted because they pay a much higher room cost than the average visitor and the economic impact of their lodging expenses will be taken into account from the Taxable Hotel Receipts data collected from the Comptroller.

The Hill Country Region Destination Report, which details visitor characteristics in the Austin-Round Rock MSA and State of Texas, provides data for party size and length of stay. According to this report, the average length of stay for overnight visitors is 3.21 days. This report also determined that parties traveling the Hill Country Region consisted of approximately 1.97 persons, including adults and children. Additional data collected through interviews with local rental agents suggest that the average party size of vacation renters and second-home visitors is significantly larger at approximately four persons per party.

Park Visitor Spending

The Lake Travis Study Area contains twelve public parks that surround Lake Travis. Eight of these parks, including Arkansas Bend, Bob Wentz, Cypress Creek, Hippie Hollow, Mansfield Dam, Pace Bend, Sandy Creek, and Tom Hughes are managed by LCRA, while Gloucester Bend, Muleshoe Bend, and Turkey Bend are operated by Travis County and Jones Brothers is operated by the city of Jonestown. LCRA and Travis County data on visitation to these parks estimate approximately 499,900 visitor-days for all of the parks in 2010. The Economic Impact Study of Lake Travis Park Visitors to Travis County, conducted by LCRA in October 2005, determined that 55 percent of total visitor-days to Lake Travis Parks are non-local, while the remaining 45 percent reside in the local area. This is also consistent with studies performed by the U.S. Army Corps of Engineers for several different lakes. Based on interviews with local management companies, the study also assumes that 15 percent of vacation renters visit parks in the Study Area, and their spending will be incorporated in the Hotel and Vacation Renter section. Please note that RCLCO recommends performing consumer research of visitors, as suggested previously, to better understand the characteristics of the local and non-local park visitors. Assuming 15 percent of vacation renters are considered non-local visitors and based on the assumption of a per person per day expenditure of \$115, the non-local visitor spending equates to \$30.6 million in 2010. Local park visitors likely spend less than non-local visitors because they live near the lake and will not have the expenditures of out-of-town visitors, including lodging, transportation, and other travel-related costs. As such, the spending estimate has been adjusted to \$32.95 per person per day. Local park visitors contributed \$7.4 million of direct spending to the local economy. The total spending by local and out-of-town park visitors in the Lake Travis Study Area was \$38.0 million.

Boater Spending

Boater spending includes spending from boaters who dock at private marinas, boaters who use public boat ramps at Lake Travis parks, and boaters with private boat docks on their homes. According to the Texas Sea Grant College Program, which tracks all marinas in Travis County, the Lake Travis Study Area contains 44 marinas, which have a total of 5,350 wet slips, 2,050 dry slips, and 30 boat ramps. According to



interviews with local marina owners, approximately 90 percent of total docks are occupied, equating to 6,652 boats currently residing in Lake Travis marinas. This analysis assumes that 97 percent of the boats are powerboats, which conforms to the share of powerboats represented in 2010 boat registrations for Travis County.

Capital Expenditures by Boat Owners

The Recreational Marine Research Center (RMRC) Boating Economic Impact Model estimates total spending for watercrafts for marinas and general boating based on type and size of recreational boats. This data estimate that annual spending on boats in a marina setting ranges from \$4,800 to \$26,500, with the variance depending on boat type and size. Figure 28 further illustrates the spending based on boat class and size.

Figure 28: Average Annual Craft Spending by Boats at Marinas (2010)

	POWER BOAT		SAIL BOAT	
	< 40'	40' +	< 40'	40' +
Slip	\$1,461	\$4,909	\$1,522	\$3,640
Loan Payments	\$1,365	\$10,447	\$819	\$5,505
Motors	\$27	\$39	\$11	\$14
Trailers	\$15	\$9	\$7	\$6
Insurance	\$399	\$2,206	\$350	\$2,034
Repairs	\$905	\$4,529	\$910	\$4,159
Accessories	\$551	\$3,260	\$824	\$3,813
Total	\$4,722	\$25,399	\$4,444	\$19,171

SOURCE: Recreational Marine Research Center

Additionally, RCLCO reviewed aerial images of Lake Travis and determined that there are 2,165 private boat dock slips, 1,910 of which are individual docks and 255 are slips in small private docks. Assuming that all of these slips are occupied by powerboats, the RMRC estimates for annual spending by general boat owners can be applied to estimate their total spending.

Based on these spending estimates, the total spending associated with keeping a boat in a Lake Travis marina is estimated to be \$32.1 million in 2010. The total spending generated by capital expenditures of boats located in private boat docks is estimated to be \$7.0 million in 2010. The total annual craft spending by both marina and private boat dock users equals \$39.1 million.

Spending Associated with Boat Use

In addition to capital expenditures, the Recreational Marine Research Center estimates daily spending by boats while they are in use on a Lake. The average daily spending on goods and services for boats originating from a marina is \$172 compared to \$109 for general boating on the lake. Boats originating from private docks are significantly less at \$60 per day. Figure 24 details the spending estimates by boating type.

Figure 29: Daily Boat Usage Spending (2010)

	MARINA BOATING		GENERAL BOATING		PRIVATE DOCKS	
	DAILY SPENDING	TOTAL SPENDING	DAILY SPENDING	TOTAL SPENDING	DAILY SPENDING	TOTAL SPENDING
Total Boat Days		190,977		36,584		54,125
Marina Services	\$23	\$4,361,900	\$10	\$373,344	\$0	\$0
Restaurant	\$33	\$6,300,594	\$20	\$736,824	\$20	\$1,094,768
Groceries	\$29	\$5,546,916	\$17	\$639,904	\$0	\$0
Boat Fuel	\$64	\$12,218,275	\$35	\$1,286,857	\$36	\$1,957,701
Auto Fuel	\$11	\$2,139,209	\$16	\$601,685	\$0	\$0
Recreation and Entertainment	\$4	\$840,847	\$4	\$145,479	\$4	\$217,943
Shopping	\$5	\$934,287	\$3	\$110,802	\$0	\$0
Other Goods	\$2	\$420,833	\$2	\$83,033	\$0	\$0
Total	\$172	\$32,762,861	\$109	\$3,977,928	\$60	\$3,270,413

SOURCE: Recreational Marine Research Center

The RMRC also estimates that powerboats in a marina setting are used 29 days per year on average, and sailboats are used slightly more at 31 days per year. Applying these estimates to the total boats in the marinas and the spending estimates yields \$32.8 million in spending attributable to boat usage.

General boater spending includes spending from boaters who launch from public boat ramps or private docks attached to residential parcels. The general boating spending estimates combined with the average RMRC usage estimate of 25 days per year for general boating generates spending estimates by boaters originating from private boat docks and the public Lake Travis Parks. Since the private boat docks are attached or in close proximity to the boat owners' homes, only a portion of this spending can be applied to private boat dock usage. The restaurant, boat fuel, and recreation and entertainment expenditures are the only categories that apply to these boaters and bring their total boat usage spending down to \$60 per day. This equates to approximately \$4.0 million and \$3.3 million in spending by general boating and private dock boating, respectively.

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RCLCO used annual fees collected from trailer permit sales at Lake Travis parks to estimate public boat ramp usage. According to LCRA and Travis County, there were 16,858 daily trailer permits and 789 annual trailer permits issued in 2010. Applying similar estimates as used in the private boat dock analysis yields a total of 36,600 boat-days on Lake Travis in 2010 from the public parks. Assuming the distribution of registered boat types for Travis County holds for the boats used at public parks, the boats used at the Lake Travis public parks generated \$4.0 million in spending.

The total spending from boat usage on Lake Travis in 2010 totaled \$40.0 million. Combined with the \$39.1 million in annual capital expenditures by marina and private dock boats, this increases the total spending to \$79.1 million.

It is important to note that this analysis only considers boat launches that originated from a private marina or for which a trailer permit was purchased. Boats launched off the backs of trucks or from other points of origin around Lake Travis are not included; therefore, this data may be under-representing the total boat-days at Lake Travis. More robust data on boating use could also be collected through a visitor survey.

Additionally, these estimates may be undercounting visitors based on the RMRC estimates of annual boat use. The 2009 Study of Recreational Boating on Lake Travis, Texas, conducted by Texas A&M, estimates higher boat usage at an average between 30 and 42 days per year, compared to the range of 25 to 29 estimated by the RMRC. We have decided to use the RMRC estimates for these assumptions because they are more applicable to our study as they describe statistics based on boater types and characteristics.

Hotel and Vacation Renter Spending

Of the 2.8 million visitors to Lake Travis in 2010, an estimated 173,000 stayed in hotels or vacation rentals. This section considers the total spending of hotel visitors and vacation renters in order to estimate the economic impacts associated with their spending. According to hotel occupancy tax receipts, total spending on lodging expenses at hotels in the Study Area equaled \$10.6 million in 2010, which indicates that Study Area hotels supplied approximately 62,100 room nights. Assuming the average party contains 1.87 persons, hotels accounted for 116,127 visitor-days in 2010. These visitors spent an additional \$11.9 million on other retail goods and services, based on the DK Shifflet & Associates estimate of an average spending per person per day of \$102. Therefore, the total spending from hotel visitors was \$22.4 million in 2010.

Lodging expenses for visitors that rented vacation rentals equaled a total of \$4.3 million in 2010. The average party size of vacation renters is larger at four persons per party, and applying the same analysis as above results in 57,030 visitor-days in vacation rentals and spending on other retail goods and services of \$5.8 million. The total spending of vacation renters was \$10.1 million.

The total spending by both hotel and vacation renters on all goods and services totaled \$32.6 million.

Second-Home Visitor Spending

This section considers spending by owners of 5,264 second homes in the Study area who spend an estimated 27 days⁸ per year in their second-home property. The number of second homes is based on the number of residential parcels that the Travis Central Appraisal District classified as “Non-Primary Residential” in 2010. Based on an average party size of four persons and an average stay of 27 days per year, the 5,264 second-homes accounted for 568,500 visitor-days to Lake Travis in 2010. We assume that these visitors spend \$102 per person per day, which is the same average expenditure as other tourists, excluding however the cost of lodging. Thus, the total spending from second-home owners visiting Lake Travis was \$58.2 million in 2010.

Total Lake Travis Visitor Spending

Lake Travis visitors spent an estimated \$168.8 million in 2010. Figure 30 highlights total visitor spending broken out by visitor type. As the chart below shows, boaters – specifically marina users – have the highest per day spending of all visitor types. Non-local park visitor, hotel and vacation renters, and public boat ramp users all have average daily spending over \$100 per day.

Figure 30: Total Lake Travis Visitor Spending

VISITOR TYPE	VISITOR-DAYS	DAILY SPENDING	TOTAL SPENDING
Park	491,343		\$38,038,236
Local	225,054	\$33	\$7,414,966
Non-Local	266,289	\$115	\$30,623,270
Hotel & Vacation Rentals	173,157		\$32,556,930
Hotel	116,127	\$193	\$22,442,649
Vacation Rentals	57,030	\$177	\$10,114,281
Second Home	568,512	\$102	\$58,187,203
Boaters	1,569,342		\$40,011,202
Marina	1,164,963	\$172	\$32,762,861
Private Boat Docks	254,388	\$60	\$3,270,413
Public Boat Ramps	149,992	\$109	\$3,977,928
TOTAL	2,802,355		\$168,793,571

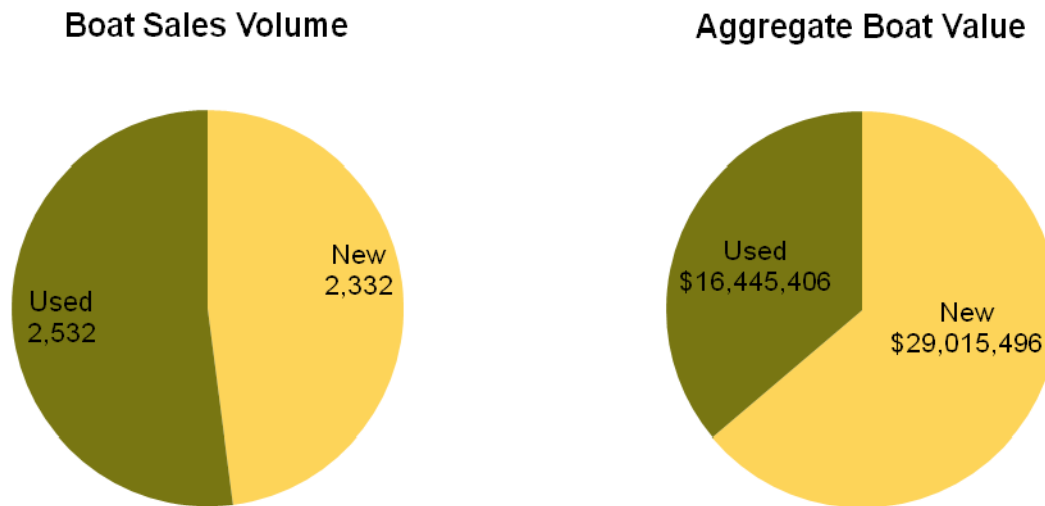
NOTE: Boater spending is calculated on a per boat basis.

⁸ 2006 National Association of Realtors Profile of Second-Home Owners

Boat Sales

The substantial recreational activity on Lake Travis also drives the purchase and sale of boats in the Study Area and creates yet another direct spending impact. According to data collected by the Texas Parks & Wildlife Department, Travis County had 4,864 boat sales in 2010, 48 percent (2,300) of which are new boats compared to 52 percent (2,500) for used boats. Although there are more sales of used boats in the county, new boats sell at approximately twice the price of used boats, on average. In 2010, boat sales totaled \$45.5 million, with \$29.0 million in the sales of new boats. Figure 31 shows the distribution of boat sales and aggregate boat value by boat type.

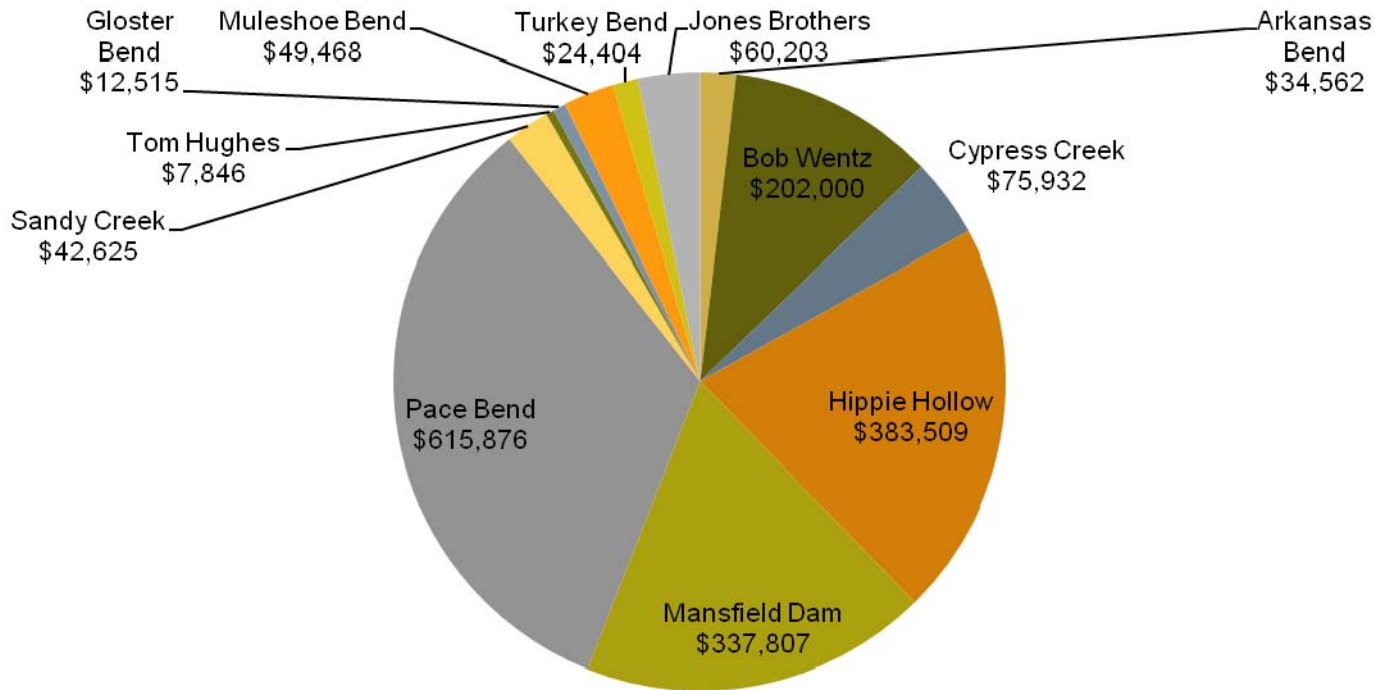
Figure 31: Distribution of Boat Sales by Boat Type (2010)



Park Fees

The public parks surrounding Lake Travis charge fees for use of the public facilities. Park fees are not included in the economic impact analysis since these fees directly fund LCRA operations and do not circulate in the regional economy. In 2010, Lake Travis parks collected \$1.8 million for permits related to day-use, camping, trailer, and other miscellaneous uses. The majority (66 percent) of these revenues came from the day-use fees, which range from \$8 to \$10 per vehicle, depending on the park. Based on total park fees collected, the most heavily used of the Lake Travis parks is Pace Bend, which collected \$615,900 in park fees in 2010. However, Hippie Hollow, Mansfield Dam, and Bob Wentz are also very popular, as they collected \$383,500, \$337,800, and \$202,000 respectively. The total park fees collected in 2010 by Lake Travis parks totals just under \$1.8 million.

Figure 32: Revenues by Lake Travis Parks (2010)



The economic impact analysis calculates the number of jobs in Travis County that are supported by spending within the Study Area. RCLCO considers the job impacts of both lake-related spending and other economic activity.

Lake-related spending within the Study Area supports a total of 1,916 jobs in Travis County, with total wages of \$69.4 million. Total jobs include jobs that are generated from both direct and multiplied spending. Direct jobs are those that are supported by lake-related spending. Indirect jobs reflect jobs that are tied to growth of businesses within industry sectors that serve the companies that receive the direct spending. Induced jobs are those that are generated from the additional spending related to income changes in sectors that are directly and indirectly affected by spending. Total value added reflects growth of the county economy as a result of local spending. Total value reflects revenues minus costs, thus is a more significant measure of

economic impact than output, which only reflects revenues. Total value generated in the regional economy by lake-related spending exceeded \$112.6 million in 2010. Total spending in 2010 for each lake-related activity along with jobs, wages, and output impacts are summarized in Figure 33.

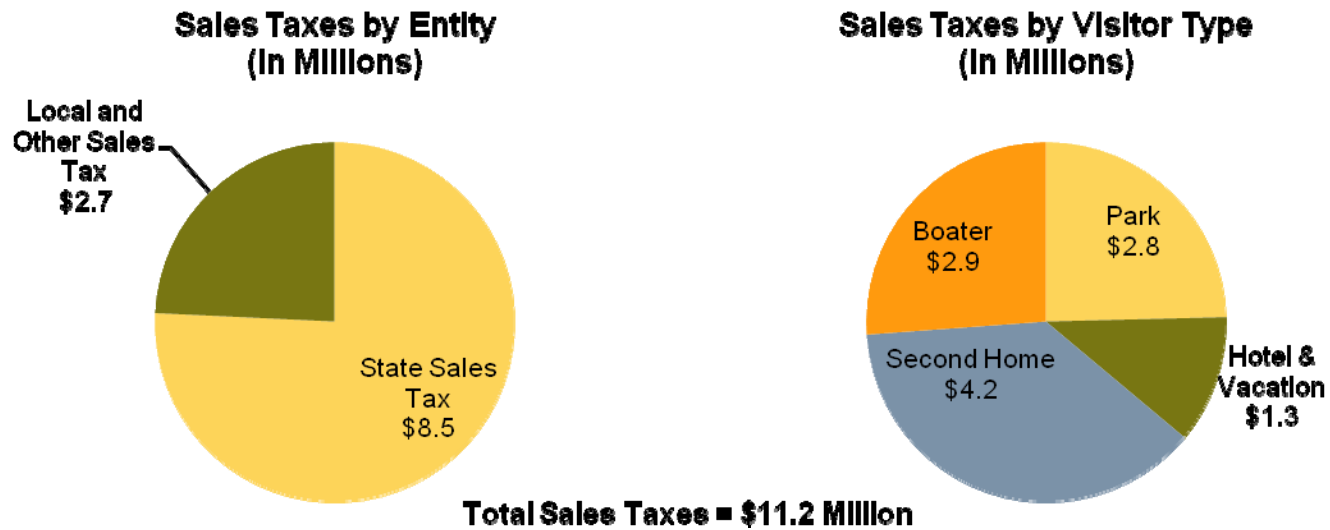
Figure 33: Jobs Supported by Lake-Related Spending (2010)

Lake-Related Activity	Employment Effects			Labor Income			Total Value Added		
	Direct	Indirect/ Induced	Total	Direct	Indirect/ Induced	Total	Direct	Indirect/ Induced	Total
Visitor Spending									
Boaters	427	146	574	\$12,357,000	\$6,785,000	\$19,142,000	\$18,248,000	\$12,019,000	\$30,266,000
Park visitors	225	69	294	\$6,585,000	\$3,096,000	\$9,681,000	\$10,118,000	\$5,763,000	\$15,881,000
Vacation renters	209	99	309	\$6,523,000	\$4,512,000	\$11,036,000	\$13,271,000	\$8,076,000	\$21,348,000
Second homeowners	332	98	431	\$9,584,000	\$4,411,000	\$13,995,000	\$14,786,000	\$8,216,000	\$23,002,000
Total Visitor Spending	1,176	409	1,607	\$34,609,000	\$18,582,000	\$53,191,000	\$56,423,000	\$34,074,000	\$90,497,000
Boat Sales	219	90	309	\$12,202,000	\$4,005,000	\$16,206,000	\$14,735,000	\$7,400,000	\$22,135,000
Total	1,395	498	1,916	\$46,811,000	\$22,587,000	\$69,397,000	\$71,158,000	\$41,474,000	\$112,632,000

Sales Taxes Generated by Direct Visitor Spending

The spending by the four Lake Travis visitor types contributes a large impact to the state, local, and other miscellaneous entities in the form of sales and use taxes. The state collects 6.25 percent of the total sales in the Study Area, while local and other miscellaneous jurisdictions collect up to two percent. The total sales taxes generated by park, hotel and vacation, second-home, and boater visitors totaled just under \$11.2 million in 2010, with \$8.5 million distributed to the state and \$2.7 million distributed to local and other taxing entities. The second-home visitors contributed the largest fiscal impact, generating a total of \$4.2 million in sales taxes.

Figure 34: Sales Taxes Generated by Direct Visitor Spending (2010)

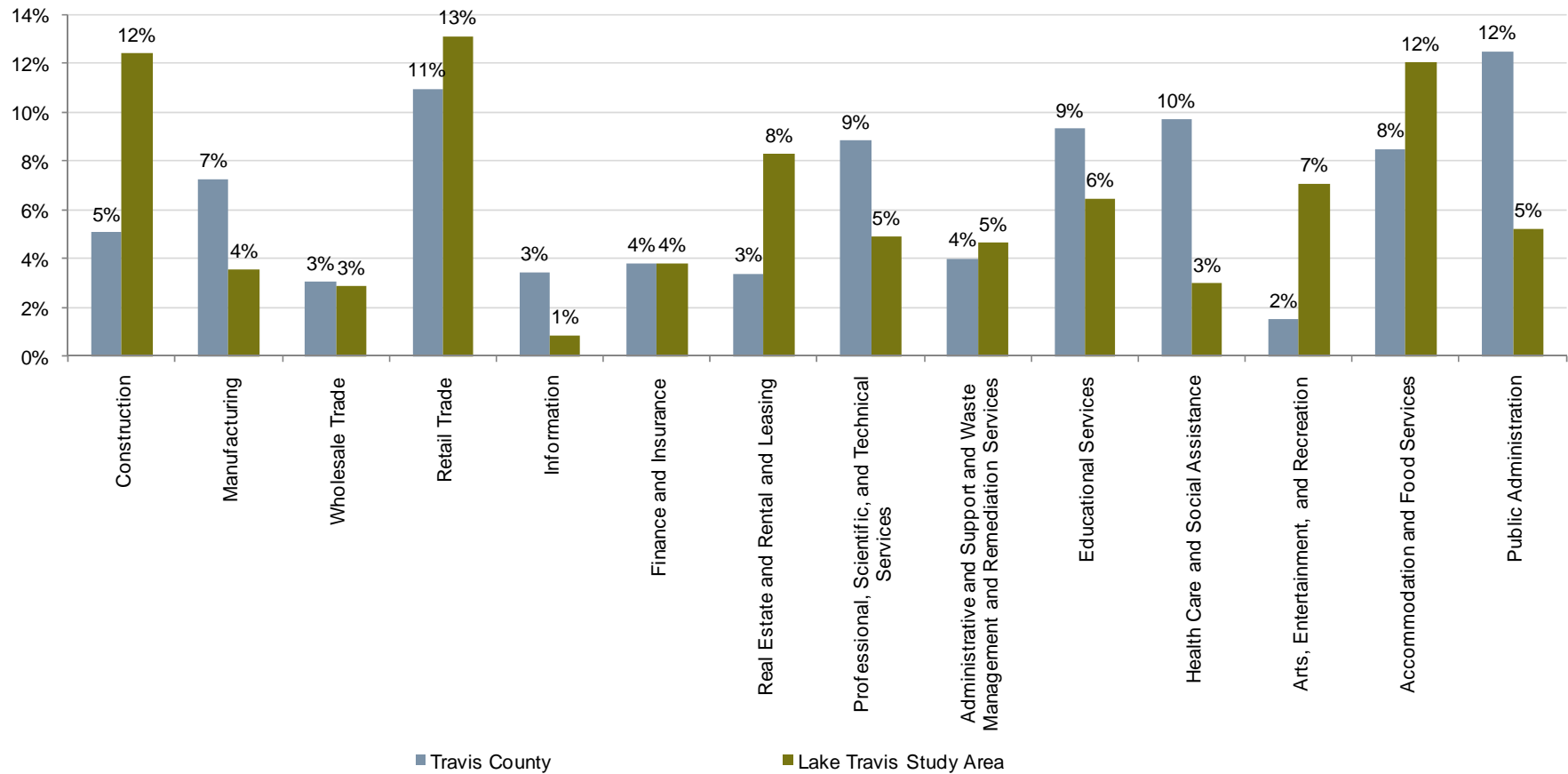


Jobs

In 2010, over 9,600 employees worked in the Lake Travis Study Area according to Esri⁹. The employment makeup in the Study Area is reflective of the importance of recreation and real estate to the Lake Travis region. Approximately 60 percent of employment in the Study Area is in retail trade (1,263 jobs), construction (1,195 jobs), accommodation and food service (1,157 jobs), real estate and rental and leasing (798 jobs), and arts, entertainment, and recreation (681 jobs). Real estate, retail, and recreation jobs comprise a larger share of total employment in the Lake Travis Study Area than in the Travis County economy, as shown in Figure 35.

⁹ Esri develops the world's leading geographic information system (GIS) technology, and the company's software is used by more than 350,000 organizations worldwide, including most U.S. federal agencies

Figure 35: Lake Travis Study Area Employment (2010)



SOURCE: Esri

C. Study Area Economic Activity

Most spending by primary households (households that consider the Study Area their primary home) and employees in the Study Area are not assumed to create a net economic impact, and are instead considered impact neutral (i.e., household and employee spending do not represent external injections into the local economy). The reason for this is that, while many households may have chosen to live in close proximity to Lake Travis for its amenity value, it is not possible without further study to determine how many of these households would choose not to live in the *region* if not for the existence of Lake Travis. In other words, would some primary households live outside of the Austin area if Lake Travis were not present, or would they simply choose to live somewhere else in the Austin area? RCLCO recommends conducting a detailed survey of primary households and employees in order to better understand how their behavior and characteristics are driven by Lake Travis and thus be able to translate their spending into a lake-related economic impact. This analysis would likely result in a higher net economic impact of Lake Travis if we could account for the households that would otherwise live outside of Austin if not for Lake Travis.

Given the above, this section is intended to quantify the level of spending by primary households and employees located within the Study Area that is not necessarily driven by the existence of the lake (lake-related spending of Study Area households and employees that visit Lake Travis parks, use the marinas, or have private boat docks is captured in the economic impact section above). Although not directly related to the lake, this spending is significant and speaks to the overall contribution that the study area has on the regional economy.

Primary households and employees located within the Lake Travis Study Area account for the largest source of economic activity within the Study Area; however, most of this spending is unrelated to activity on the lake. Primary household and employee spending that is unrelated to the lake is classified as impact neutral. In other words, impact neutral spending has no net effect on the economic impact study because the spending would likely occur anyway, unless, as stated before, these households would choose to have their primary residence outside of the Austin region, thus resulting in a negative net economic impact as their spending on groceries, home appliances, and a variety of other goods and services would occur elsewhere. Without any evidence to the contrary, we assume that spending by these primary households and employees that is not directly related to the lake would occur in the region regardless of Lake Travis.

Primary households and office workers located within the study area collectively generated a total of \$688 million in spending in 2010 and supported almost 5,200 jobs in Travis County.

Figure 36: Jobs Supported by Economic Activity (2010)

Economic Activity	Employment Effects			Labor Income			Total Value Added		
	Direct	Indirect/ Induced	Total	Direct	Indirect/ Induced	Total	Direct	Indirect/ Induced	Total
Household Spending	3,901	1,117	5,019	\$117,904,387	\$51,601,879	\$169,506,266	\$178,322,509	\$96,481,672	\$274,804,181
Office Worker Spending	138	37	175	\$3,693,747	\$1,724,002	\$5,417,749	\$5,587,010	\$3,230,114	\$8,817,124
Total	4,039	1,155	5,193	\$121,598,134	\$53,325,881	\$174,924,015	\$183,909,519	\$99,711,786	\$283,621,305

The following section details and quantifies the total economic activity associated with spending from households and employees located within the Lake Travis Study Area. Household and employee spending that is lake-related is considered within the park visitor section of the economic impact analysis.

Household Spending

Spending by primary households in the Study Area comprises the most spending by any group that visits or lives in the study area. ESRI Business Analyst estimates were used to determine average household spending by primary households in the Lake Travis Study Area. There are currently 18,093 total primary households residing in the Study Area. These households spent an average of \$37,121 on retail goods and services in 2010, which is approximately 45 percent of the \$82,000 average household income. Comparatively, Travis County households spend approximately 49 percent of average household income, \$62,200, on retail goods and services. Of the \$37,100 spent on retail goods and services by Study Area households, \$6,500 (17.4 percent) was spent at Food & Beverage Stores, \$5,800 (15.5 percent) was spent at Food Services & Drinking Places, \$4,900 (13.2 percent) was spent at gasoline stations, \$3,200 (8.7 percent) was spent at General Merchandise Stores, and \$550 (1.5 percent) was spent at Sporting Goods, Hobby, Book, and Music Stores. The total spending by these primary households was approximately \$671.6 million in 2010.

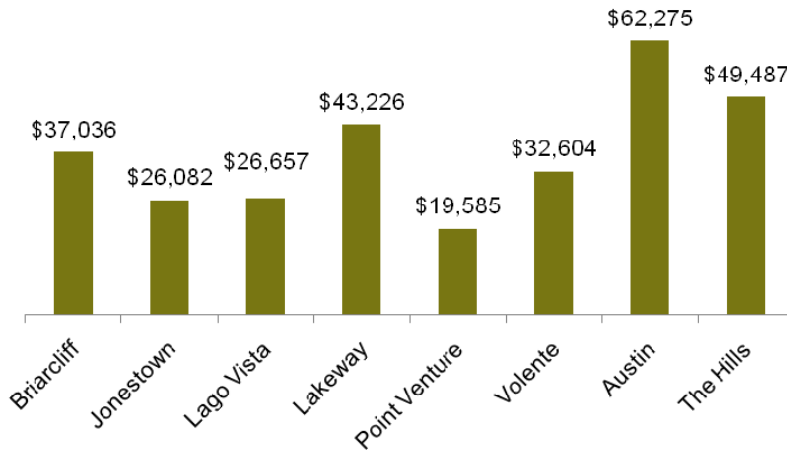
Figure 37: Primary Household Spending in Study Area (2010)

		TOTAL SPENDING
Total Households	18,093	
Spending per Household		
Motor Vehicle & Parts Dealers		\$7,964
Furniture & Home Furnishings Stores		\$1,559
Electronics & Appliance Stores		\$1,264
Bldg Materials, Garden Equip. & Supply Stores		\$1,521
Food & Beverage Stores		\$6,459
Health & Personal Care Stores		\$957
Gasoline Stations		\$4,905
Clothing and Clothing Accessories Stores		\$1,610
Sporting Goods, Hobby, Book, and Music Stores		\$553
General Merchandise Stores		\$3,244
Miscellaneous Store Retailers		\$504
Nonstore Retailers		\$816
Food Services & Drinking Places		\$5,766
Total Spending per Household		\$37,121
Total Spending		\$671,631,175

SOURCE: ESRI Business Analyst

The average household retail spending by jurisdictions located in the Study Area ranges from as low as \$19,600 in Point Venture to as high as \$62,300 in Austin (See Figure 38).

Figure 38: Average Annual Household Retail Spending by Jurisdiction (2010)

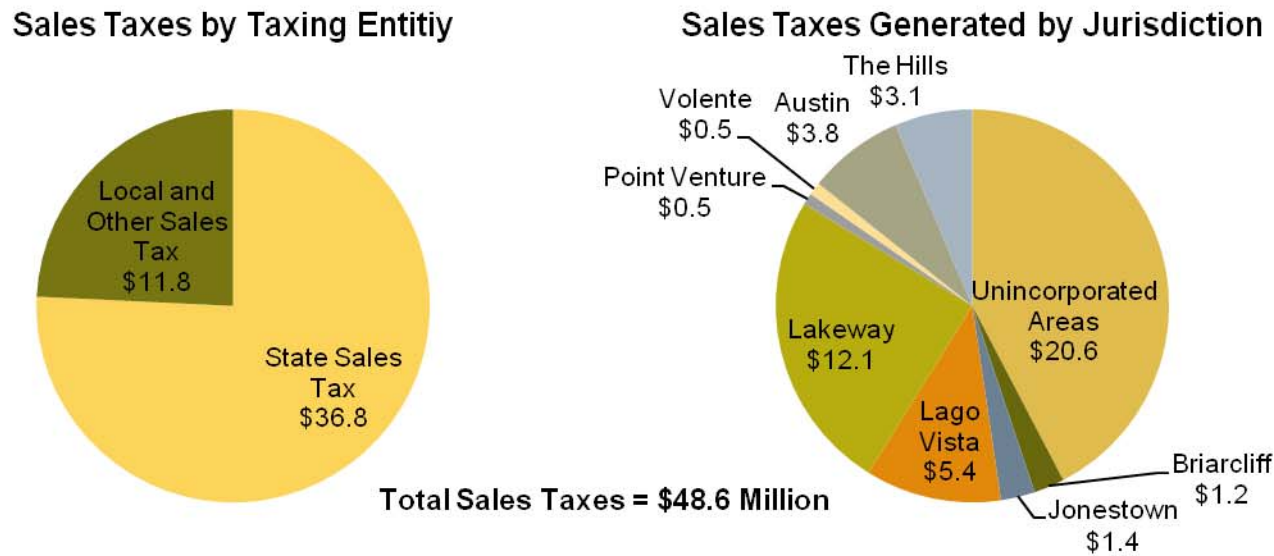


SOURCE: ESRI Business Analyst

Sales Taxes Generated by Primary Household Spending

Spending by primary households in the Lake Travis Study Area totaled \$671.6 million dollars in economic activity in 2010, which translates into an estimated \$48.6 million in sales taxes. Of the total sales taxes generated by primary household spending, 75 percent, or \$36.8 million, was distributed to the State, and the remaining 25 percent, or \$11.8, million was distributed to local and other taxing entities. The households in the Unincorporated Areas of the Study Area contributed the most sales taxes, totaling \$20.6 million. The areas of Lakeway and Lago Vista contributed the next most, with \$12.1 million and \$5.4 million respectively.

Figure 39: Sales Taxes Generated by Primary Household Spending (2010)



Employee Spending

The Study Area contains over 9,600 employees, of which an estimated 2,425 occupy office space. These workers contribute to the local economy in the form of retail spending during their workday. The International Council of Shopping Centers estimates the weekly retail spending patterns in the following four categories: \$31 for lunch, \$13 for dinner/drinks, \$56 for destination shopping, and \$40 for convenience shopping. Annual spending patterns for these employees were estimated assuming the average Study Area employee works 49 weeks per year. Based on this data, the Lake Travis Study Area office workers generated over \$16.5 million in spending in 2010. This spending also generates revenue in the amount of \$886,000 to the state and \$284,000 to local or other taxing entities.

Figure 40: Office Worker Spending (2010)

AVERAGE SPENDING PATTERNS (ANNUAL)	STORE TYPE	PER WORKER SPENDING	TOTAL SPENDING	% TAXABLE	SALES TAX	
					STATE	LOCAL/OTHER
STUDY AREA OFFICE EMPLOYEES			2,425			
TAX RATE					6.25%	2.00%
Dining - Lunch	Limited Service Restaurant	\$1,495	\$3,623,565	100%	\$226,473	\$72,471
Dining - Dinner/Drinks	Full Service Restaurant	\$637	\$1,544,470	100%	\$96,529	\$30,889
Destination Shopping	Apparel/Electronics/etc	\$2,734	\$6,629,341	100%	\$414,334	\$132,587
Convenience Shopping	Pharmacy/Grocery	\$1,965	\$4,764,097	50%	\$148,878	\$47,641
TOTAL		\$6,831	\$16,561,473	86%	\$886,214	\$283,588

D. Lake Level Impacts

Lake Travis experiences stable lake levels when water elevation is between 660 and 681 feet above sea level. As lake levels begin to fall below 660 feet, visitation and recreation begin to decrease, but the lake still receives significant economic impacts from lake-related visitation. At lake levels below 650 feet, visitation sharply declines, driven by the closure of most of the lake's boat ramps as well as media attention which highlights safety and accessibility issues, perceived or real, at Lake Travis. As this occurs, visitor spending decreases and creates significant negative fiscal and economic impacts on the local economy as revenues at local hotels, restaurants, and other tourism-serving businesses fall. Additionally, Lake Travis is an amenity to the residents of neighborhoods surrounding the lake, and extreme drops in water level could also affect the property value of homes surrounding the lake, resulting in negative fiscal impacts on the area. Finally, reduced lake levels impact the costs and revenues of the public utilities that draw from Lake Travis. Key conclusions regarding the fiscal and economic impacts of low lake levels as well as the impacts on lake-dependent businesses are addressed below.

The lake level impact analysis considers economic and fiscal impact trends over time in order to determine if and how Lake Travis water levels contribute to changes in economic activity. This analysis evaluates lake levels relative to valuations, transactions, spending, visitation, economic impact, and fiscal impacts in the Study Area from 2006 to 2010. The goal of the analysis is to identify correlations between lake levels, economic, and fiscal impacts.

Identifying correlations between lake levels and economic and fiscal impacts is complex because many local, regional, and national factors that are unrelated to lake levels affect spending, visitation, and property valuations. Between 2006 and 2010, population growth, commercial development, a national and local recession, and lake levels all contributed to changing household and consumer behaviors in the Study Area.

LAKE TRAVIS ECONOMIC IMPACT REPORT FINDINGS AND CONCLUSIONS

This analysis isolates and solves for the effects of lake level fluctuations by comparing economic and fiscal impacts in the Study Area to control sets of data. For example, Lake LBJ served as a control for residential transactions, due to the fact that Lake LBJ is a constant level lake with new residential neighborhoods similar to those of Lake Travis. Other Central Texas lakes managed by the Army Corps of Engineers served as benchmarks for visitation estimates since the Army Corps rigorously surveys and measures lake visitation. RCLCO also compared trends in volume and pricing of residential transactions in the Study Area to changes in transaction activity observed around other lakes, including Lake Hartwell, which borders Georgia and South Carolina, and Lake Lanier in Georgia.

D.1. Fiscal Impacts of Lake Level Fluctuations

When Lake Travis experiences extreme fluctuations in water levels, the total amount of tax revenues collected by state and local entities declines. The drivers of fiscal impacts – assessment values, sales receipts, hotel receipts, and mixed beverage receipts, are highly sensitive to population size, commercial supply, economic conditions, visitation rates, lake levels, and other macroeconomic conditions. This section evaluates how much in tax dollar revenues the Study Area brought to state and local agencies from 2006 to 2010, and isolates the effects of lake levels in order to understand the changes to tax revenues that result from extreme fluctuations in lake level. Due to the complexity of the economic and demographic pressures that combine to affect fiscal revenues, the analysis cannot quantify the amount of lost revenue associated with specific intervals of lake level decline. Rather, the analysis considers fiscal revenues during periods when lake levels were normal (over 660 feet) and during extreme lake level conditions (below 660 feet or above 680 feet). Low Lake Travis water levels could cause the following negative economic impacts:

- Reduction in residential property tax revenues of \$15 million to \$20 million from homes located within the Study Area (the estimated value of loss of property tax revenue associated with the complete loss of premium associated with Lake Travis)
- Reduction in sales tax revenues of \$1.3 million to \$1.7 million
- Reduction in hotel occupancy taxes of \$37,000 to \$45,000
- Reduction in mixed beverage taxes of \$98,000 to \$120,000

Analysis of the Premium Lake Travis Delivers to Study Area Properties and Implications of Lake Level Fluctuations

This analysis evaluates historical trends in assessed values of residential parcels in the Study Area as compared to residential parcels in Travis County between 2006 and 2010. The study compares assessed values for primary-home and second-home parcels, and also compares assessed values for lake-adjacent, lake-cove, and non-lake-related parcels.

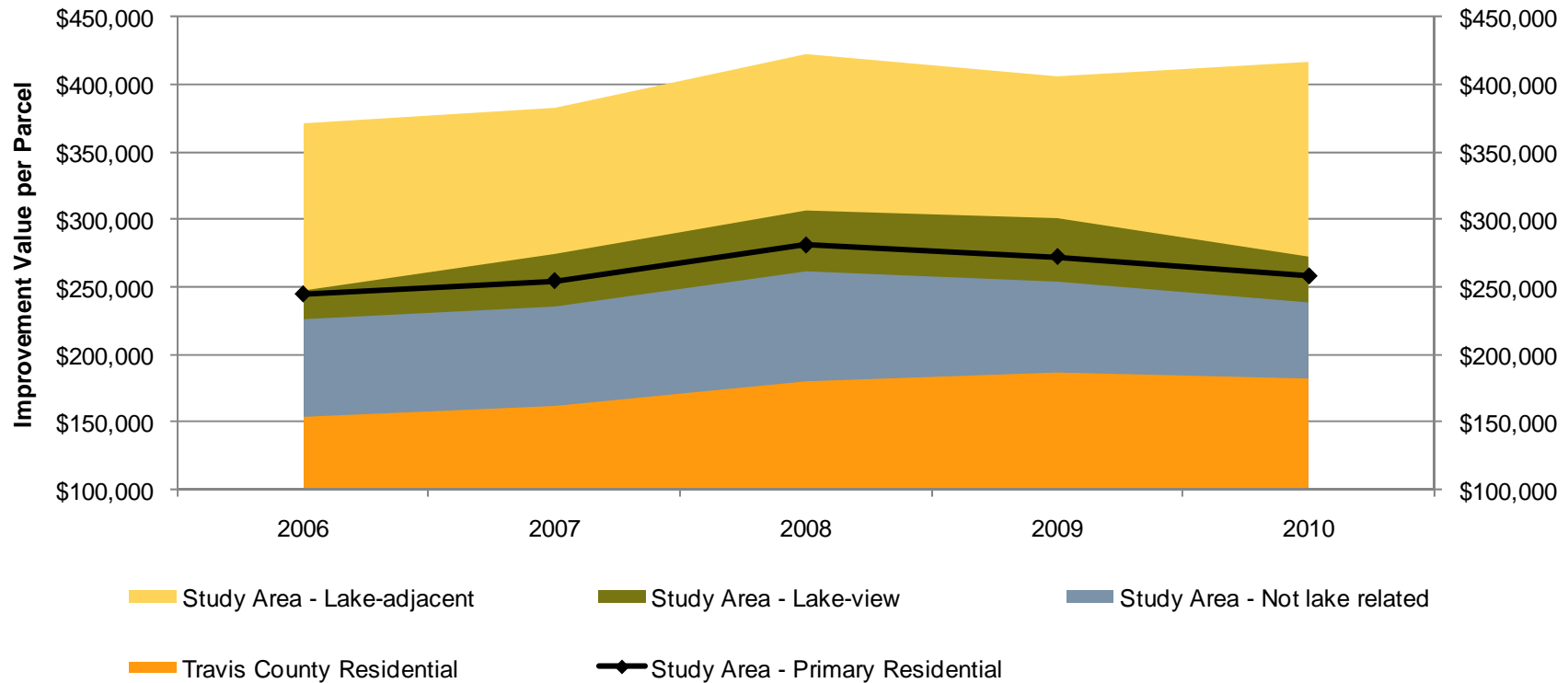
To isolate the effects of lake levels on assessed residential values, this study uses Travis County assessed values for all residential parcels as a control. Assessed values reflect the current estimated sale price of a property, and economic and demographic conditions typically affect assessed values. For example, the recession that began impacting Texas in late 2008 would affect property assessments, as would changes in residential supply and demand. Assessed values for various residential parcel types in the Study Area are compared to Travis County residential assessments in Figure 41.

Improvement Value per Parcel

This section compares the absolute value (measured in improvement value per parcel) of residential structures in the Study Area and Travis County in order to estimate the premium per structure of residential properties based on location. Improvement value reflects the assessed value of the residential structure and does not include land. The average improvement value per Study Area residence was \$262,000 between 2006 and 2010. During the same time period, the average improvement value per residence in Travis County was \$173,000. Figure 41 illustrates the average improvement values for residential parcels in Travis County, parcels in the Study Area that are not lake-related, parcels in the Study Area and with lake views, and parcels in the Study Area and adjacent to the lake. On average, residences in the Study Area are 52 percent more expensive than those in Travis County. Part of the premium can be attributed to the value of the Study Area's Hill Country location.

The premiums that are tied directly to Lake Travis can be seen by comparing the improvement values of parcels that are located lake-adjacent and lake-view to the average parcel in Travis County. With average assessed improvement values of \$400,000, lake-adjacent structures have improvement values that exceed average Travis County valuations by \$227,000, or 131 percent, and exceed average Study Area parcels by \$138,000 or 52 percent. Lake-view parcels are valued at a slight premium to the Study Area, with average valuations of \$280,000.

Figure 41: Improvement Values per Parcel (2006 - 2010)



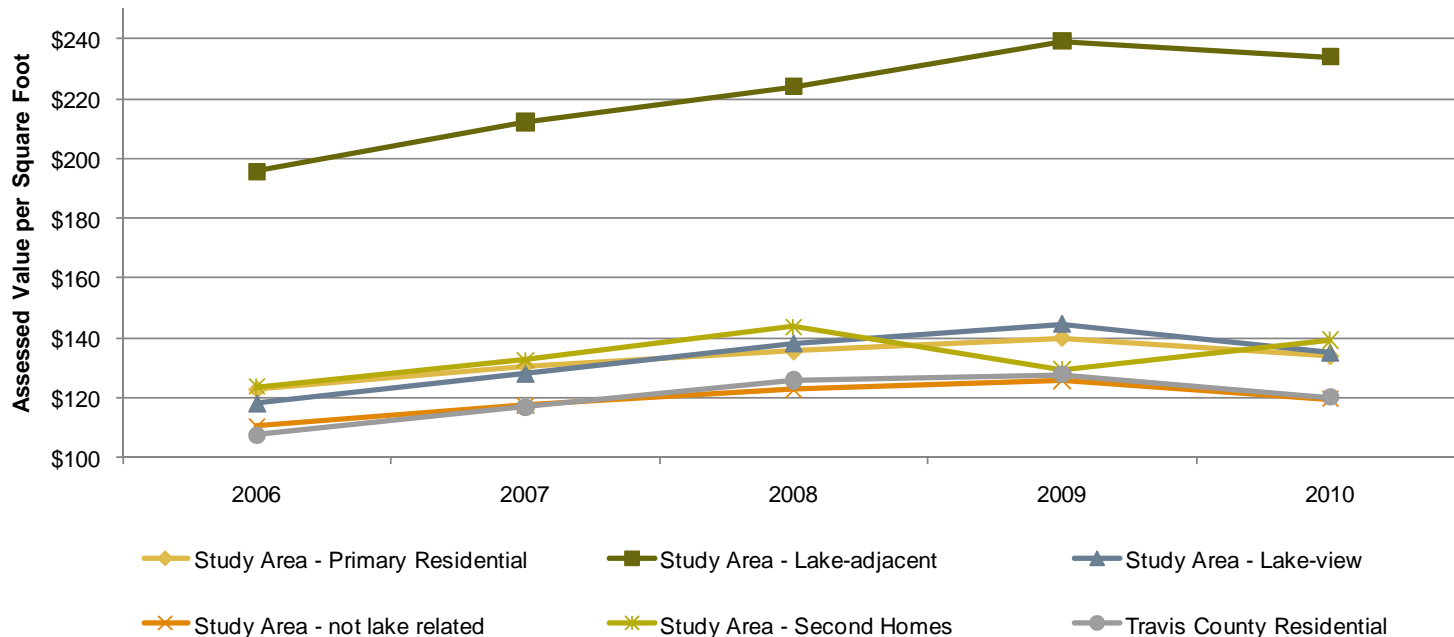
Assessed Value per Square Foot

This section compares assessed values normalized by square foot, which serves as one metric by which to compare properties of different sizes. Primary residential parcels in the Study Area had an average assessed value per square foot premium of 11 percent above Travis County residential parcels from 2006 to 2010, and this value premium can largely be attributed to proximity to the lake. Lake-adjacent parcels (lake-front or lake-cove) had assessed value per square foot premiums of 85 percent as compared to Travis County. Residential parcels with a lake view that were not adjacent to the lake had an assessed value premium per square foot of 11 percent. The assessed value per square foot premium is only seen in lake-related parcels; residential parcels in the Study Area that had no relation to the lake (not adjacent to the lake and did not have a lake view) had average assessed values per square foot that were the same as Travis County as a whole.

Assessment values for all primary residential parcels in the Study Area follow similar growth trends to Travis County, with assessed values growing steadily from 2006 to 2009, and then dropping by five percent to seven percent in 2010. The matching growth trajectories for assessment values for primary residential parcels in the Study Area and all residential parcels in Travis County indicate that the economic and demographic pressures that caused shifts in valuation in the county had a matching effect for the Study Area, and lake levels did not have a discernable effect on valuations for primary residences between 2006 and 2010. Lake levels appear to have a more significant impact on the valuation of second-home parcels. In 2009, when Lake Travis experienced historic drought conditions, assessed values for second-home parcels dropped by 10 percent. No other residential parcel type experienced a loss in value in 2009.

There are several reasons why the valuation of second-home parcels would react to extreme lake level fluctuations when primary residential parcels do not. First, the value of a second home is tied to its income potential, and when lake levels drop to 2009 levels, visitation drops as well. For primary residences, lake level drops cause a temporary decline in the amenity value of the property, but do not affect the primary function of the home to its owner – that of a primary residence. Primary residences maintain their value even in years with extreme lake level declines because the market perceives this decline to be temporary.

Figure 42: Residential Assessments Trends (2006 -2010)



Total Assessed Value

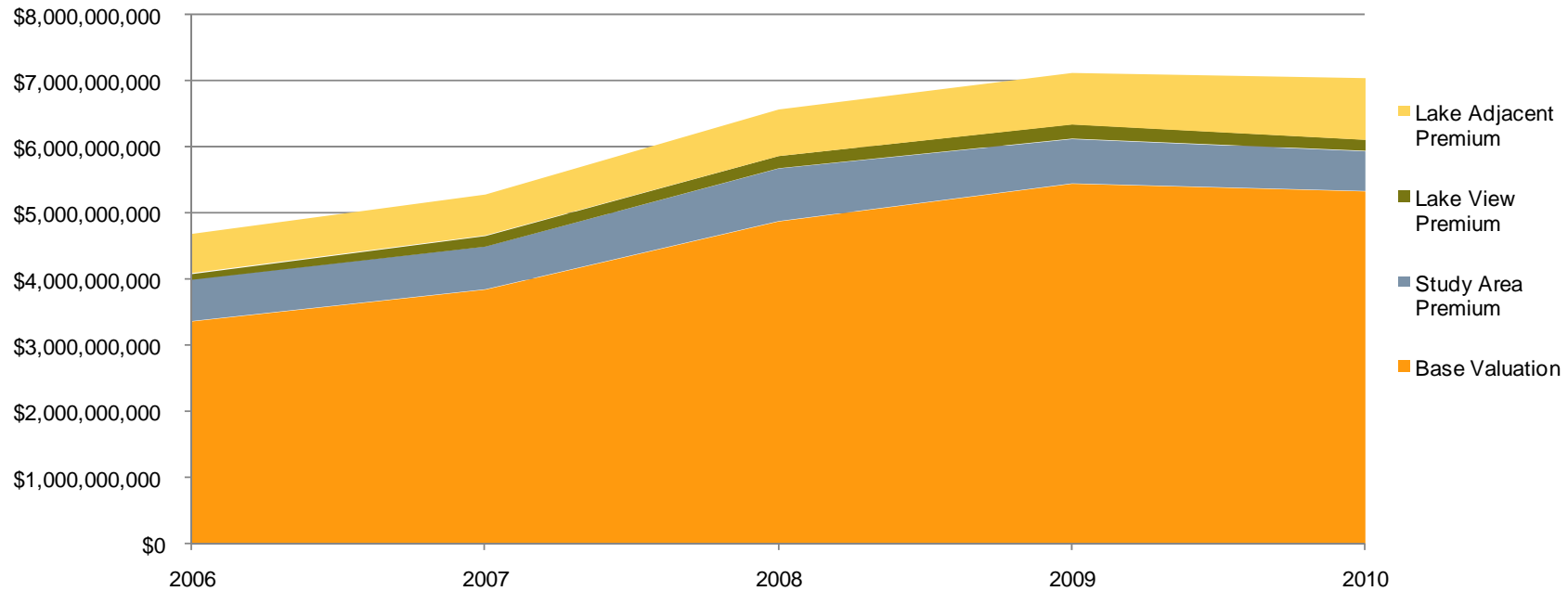
This analysis considers total assessed values (land and improvements) for all residential parcels in the Study Area in order to quantify the fiscal impacts of the residential parcels over time, and also to quantify the total value of the premium associated with Lake Travis. Total assessed value grew at a faster rate than development in the Study Area, which indicates appreciation in the value of Study Area Parcels. The total assessed value of all of the residential parcels in the Study Area grew from \$4.3 billion to \$6.7 billion from 2006 to 2010, an average annual growth rate of 11.6 percent. Total developed parcels grew at an average annual rate of 6.8 percent. Corresponding property tax payments grew from \$146 million in 2006 to \$158 million in 2010.

The Lake Travis Premium

RCLCO estimates the total assessed value of residential parcel adjacent to the lake, with a lake view, and in the Study Area in order to estimate the total premium associated with Lake Travis and the potential loss in value which could result from a permanent and significant reduction in lake levels. The analysis begins by defining the base valuation for the Study Area parcels, which reflects the estimated value of the parcels without any locational premiums and is equal to the average assessed value for residential parcels in Travis County on a per-parcel basis. The Study Area premium reflects the total additional assessed value that parcels gain because they are located in the Study Area. The Study Area premium ranges from \$600 million to \$795 million from 2006 to 2010. While some of the Study Area premium is created by the proximity to Lake Travis, this analysis conservatively assumes that the more exclusive Hill Country location of the Study Area will continue to command a premium, although not as large, even if lake levels deteriorate.

The assessed value premiums of lake view and lake adjacent locations are linked directly to Lake Travis, and would not occur if the lake did not exist. Lake Travis premiums created residential value that ranged from \$677 million in 2006 to \$1.1 billion in 2010. Moreover, the value of the Lake Travis premium grew by approximately \$105 million per year each year from 2006 to 2010. **The value premium associated with Lake Travis represents 15 percent of the total value of all of the residential parcels**, and thus accounts for 15 percent of all property taxes collected from residential parcels in the Study Area as well. A loss in 15 percent of property tax revenues translates into a total annual reduction of \$15 million to \$20 million in property tax collections, based on historical property tax collections from 2006 to 2010.

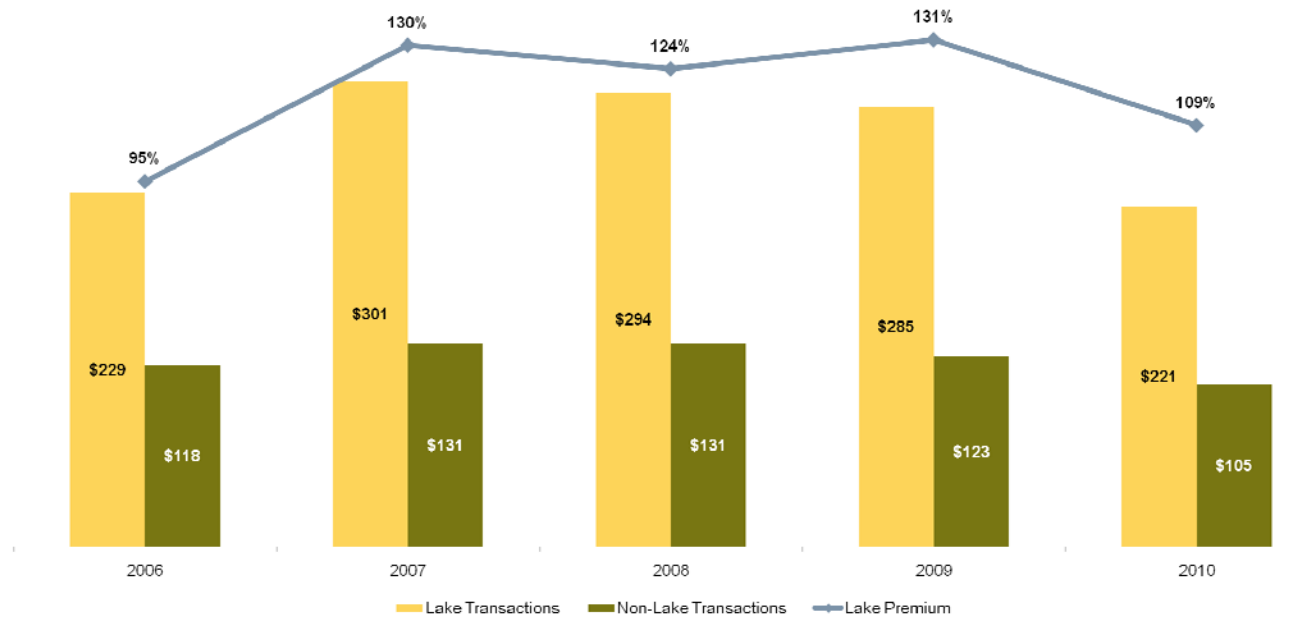
Figure 43: Study Area Total Assessed Value (2006 - 2010)



Change in Transaction Value and Volume

Lake Travis is a primary driver of residential home sales in the Study Area and has a significant impact on sales price and volume. Based on transaction data collected by Travis Central Appraisal District, the Study Area has averaged 940 sales per year between 2006 and 2010 with an average sale price of \$425,000. Of these sales, an average of 70 per year are considered either lake front, lake cove, or lake view, and achieve an average price of \$911,500 over the five year time period, while the remaining 870 home sales per year not located near or on the lake averaged a much lower sale price of \$384,400. On a price per square foot basis, lake related home sales (\$265 per square foot average) have received an average premium of 100 percent over non-lake related homes (\$133 per square foot average). Figure 44 shows the relationship between lake and non-lake transactions, as well as the premium lake related homes receives compared to non-lake homes.

Figure 44: Average Home Price per Square Foot and Lake Premium (2006 – 2010)



SOURCE: Travis Central Appraisal District

A variety of factors impact residential transactions in the Lake Travis Study Area, one of which is lake levels. However, a comparison of Lake Travis Study Area home transactions and lake levels indicates that there is not as clear a relationship between these two factors as one might think because the lake premium increases during drought years. It is important to note that it is difficult to determine the direct impact that lake levels had on home transactions and price during this time period, as the economy was significantly depressed and likely had a larger impact on residential trends than lake levels. The effects of the recession coupled with the low lake levels in 2009 have made one thing clear: low lake levels have a significant impact on sales volume of properties on or near the lake and a slight effect on sales volume of non-lake properties. However, based on this data, it seems as though low lake levels do not affect home prices, as prices increased significantly, by 16 percent and seven percent, in the recent drought years of 2006 and 2009 respectively. This suggests that, although there are fewer buyers in low lake level years, these buyers gravitate toward higher priced homes, which may be at a discount to their price in period of stabilized lake levels.

Comparatively, home transactions of lake front property on Lake LBJ, a constant level lake located just west of Lake Travis, reacted much differently than the Lake Travis homes. In 2009, in which Lake Travis was in a drought, the recession caused a 16 percent increase in sales volume and a 12 percent decrease in sales price on Lake LBJ properties. On the other hand, Lake Travis lake-related properties responded to the drought and recession with transaction volume falling drastically by 35 percent and price increasing by 21 percent. Given that these sales were during a severe recession, this comparison further indicates the large effect that lake levels have on the sales of lake homes in the Study Area, yet in a different way than is expected.

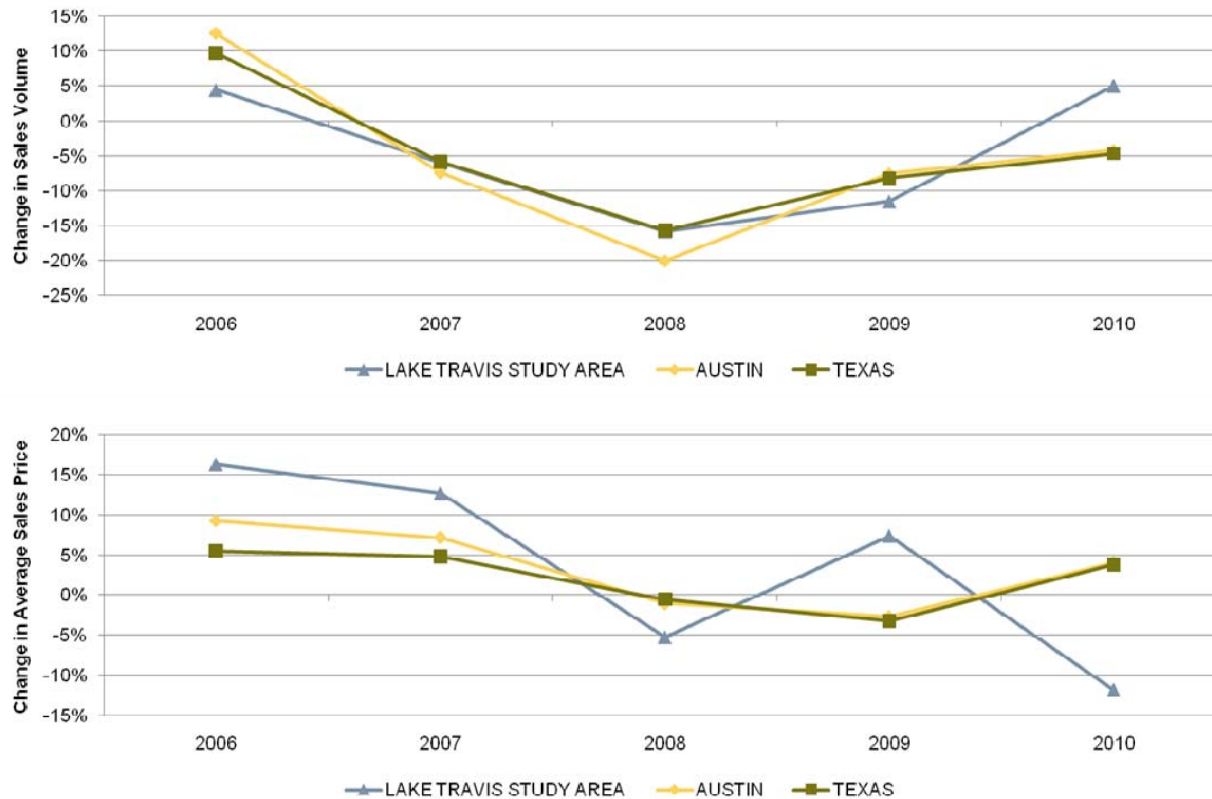
The second most recent drought occurred in 2006, when lake levels averaged 655 feet above sea level. In this year, all Lake Travis home transaction volume increased by four percent with sales of homes on or near the lake falling by eight percent, compared to a six percent increase in volume for homes not located on or near the lake. However, during this same year, average prices increased dramatically by 27 percent for lake related homes and 16 percent for all other homes. These trends are consistent with the larger residential markets in Austin and the State of Texas as a whole, as they experienced increases in both volume and average price in 2006, suggesting that lake levels had little impact.

Lake levels stabilized in 2007 and 2008 and Study Area residential sales experienced similar volume and average price fluctuations as Austin and Texas. In 2007, sales volume fell by approximately six percent in all three markets, while price increased by 13 percent in the Study Area, seven percent in Austin, and five percent in Texas. These three home sales markets suffered significantly in 2008 as volume dropped between 16 percent and 20 percent, and average price fell between one percent and five percent. The charts in Figure 45 better depict the home transaction trends in these three geographies between 2006 and 2010.



Walkway to Hurst Harbor Marina & Johnny Fins, Drought Conditions

Figure 45: Average Sales Volume and Average Sales Price, Lake Travis Study Area, Austin, Texas (2006 – 2010)



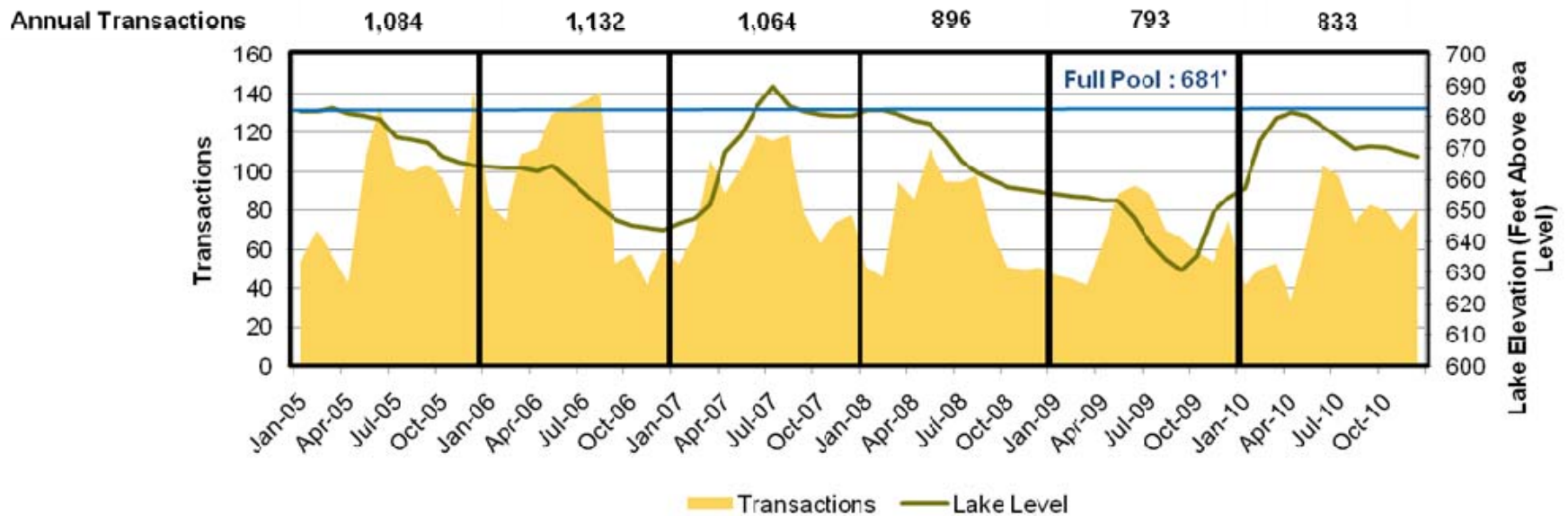
SOURCE: Travis Central Appraisal District; Texas A&M University Real Estate Center

The drought in 2009 presents an even greater anomaly in terms of the relationship between water levels and price. During this year, lake levels were at their lowest elevations since the previous major drought, which lasted over two years in the mid-1960s. The recent drought had a significant impact on sales volume as lake transactions fell by 35 percent and non-lake transactions fell by nine percent, with the majority of the decrease occurring during the peak season when lake levels experienced the largest decreases. Overall, the decrease in sales transactions in the Study Area was an 11 percent decrease, slightly larger than the eight percent decrease in Austin and Texas. On the other hand, average sales price did not react as expected, with lake related average prices increasing 21 percent and non-lake pricing increasing by nine percent, while prices in Austin and Texas fell by three percent.

This drought ended in early 2010 and transactions picked back up, increasing sales volume by 54 percent for lake homes and two percent for non-lake homes, yet volume in both Austin and Texas fell between four percent and five percent. Although lake levels stabilized and sales volume increased, average sales price in the Study Area decreased by 12 percent, compared to price appreciation of four percent in both Austin and Texas.

Between 2005 and 2007, transactions averaged 1,093 per year compared to 841 transactions between 2008 and 2010. During the severe drought in 2009, total transactions totaled 793, 48 sales below the three-year average. Other than lake levels, household growth, development, and the recession have impacted residential sales. To isolate the effect of the lake levels on transaction volume, RCLCO attributed a weight to each of the variables. The resulting calculation estimates that low lake levels will reduce transaction volume by four percent, or 33 transactions in a year.

Figure 46: Total Monthly Transactions vs. Monthly Lake Levels (2006 – 2010)



SOURCE: Travis Central Appraisal District, LCRA

Similar to Lake Travis, studies for other lakes have discovered a correlation between transaction volume and lake level. The “Economic Analysis of Low Water Levels in Hartwell Lake,” conducted by the U.S. Army Corps of Engineers, found that there is a decline of one-third to two transactions per every foot decline in lake level, when the lake is at least four to seven feet below full pool. The “Lake Sidney Lanier Economic Impact Analysis,” conducted by Bleakly Advisory Group in 2010, also studied the effects of lake level fluctuation on real estate transaction on Lake Lanier in Georgia. This study concluded that poor lake levels are perceived as temporary, and it is reasonable to assume that prospective sellers kept their properties off the market or refused to sell their home at a discount, and would instead wait until lake levels have stabilized to put their properties on the market.

Amenity Value of Lake Travis

The existence of a lake typically creates a value premium for residential and commercial real estate that surrounds it, particularly for home sites which offer lake access and/or scenic views. Based upon data from the Travis Central Appraisal District, the presence of Lake Travis adds a premium of \$1.1 billion in additional value to nearly 2,500 lakefront homes. These lakefront homes generate \$17.4 million in annual county and school district property tax revenues within the study area. Lakefront homes generate \$12,600 in property tax revenues per unit, as compared to \$5,600 per unit on average for homes in the Study Area that are not on the lake and do not have lake views.

There are significant fiscal impacts to local taxing entities from lakefront homes in the Study Area. The residential premiums result in higher property tax revenues. Spending from wealthier households occupying lakefront homes results in higher sales tax revenues. However, the incremental annual construction, rehabilitation, brokerage, and financing of lakefront homes that might not otherwise exist themselves are not an annual economic impact, but rather a wealth effect. It is important to understand the difference between the two. Using an estimated 1.5 percent annual rate for sales turnover, the above estimates regarding the “premium value” of lakefront properties translates to an annualized wealth effect of \$79.2 to \$95.7 million and \$4.7 to \$5.7 million in increased annual brokerage commissions from the sale and resale of these units.

It can be assumed that the value premium would not exist were it not for the existence of Lake Travis; it is also likely that a large percentage of this housing would not exist at all, particularly those homes that are vacation, second, or seasonal homes that were purchased because of the existence of the lake. The additional spending in the region among these lakefront homeowners generates economic activity in the area that would likely not otherwise exist. Most owners of lakefront homes have well above average household incomes and include many retirees and seasonal homeowners who probably live in the region exclusively because of the recreational amenities offered by Lake Travis. However, this value premium is a wealth effect and should not be confused with an annual economic impact.

LAKE TRAVIS ECONOMIC IMPACT REPORT FINDINGS AND CONCLUSIONS

Lake Travis Study Area Sales Taxes

This section considers trends in sales within the Study Area as measured by taxable sales, as reported by the Texas Comptroller Office, in order to better understand 1) whether there is a correlation between sales and lake levels, and 2) whether sales for businesses near the lake are more affected when lake levels drop. Figure 47 highlights trends in taxable sales between 2006 and 2010, and shows how lake levels and various indicators of growth and wealth changed in the same years. Sales taxes are tied directly to spending; therefore, the various factors that cause spending to fluctuate – such as economic strength, consumer confidence, and the wealth effect – cause sales tax revenues to change as well. Additionally, taxable sales are directly linked to retail supply.

Taxable sales in the Study Area ranged from \$374 million to \$548 million between 2006 and 2010. In 2008, sales receipts increased dramatically by \$67 million, and remained above \$500 million through 2010. The sales receipts per Travis County residents shows that, in 2008, the share of taxable sales per Travis County resident grew by 11 percent, which indicates that Travis County residents spent more of their expenditures in the Study Area in 2008. The growth in aggregate and per-person sales can partially be attributed to the Hill Country Galleria, a 1.3 million square foot shopping center that opened in October 2007. The mall would have experienced a boost in sales in during its first year due to the buzz, and sales would be expected to subside in subsequent years, which is confirmed by the data. However, the new mall alone cannot explain trends in sales receipts; lake levels, wealth effect, and household growth must be considered as well.

In addition to the new mall opening in 2008, the Study Area experienced a dramatic growth in households in the same year. The number of households in the Study Area grew from 10,621 to 14,068 between 2006 and 2010, with a dramatic growth of 1,800 households in 2008. This analysis uses primary residential parcels as a proxy for households since household data is not available annually for the Study Area. Household growth in the Study Area increases local retail demand across the board, and also helps to explain the growth in sales receipts from 2008 onward.

The analysis of the correlation between taxable sales and lake levels is further complicated by economic conditions, which were extraordinarily turbulent in between 2006 and 2010. Inflation and real GDP serve as two indicators for the rampant growth and subsequent recession that occurred in the last five years. The recession, which was first felt in Travis County in 2008, hurt retailers nationwide as shoppers stopped shopping. An economic phenomenon called the wealth effect could have also contributed to the rise and fall of sales. The wealth effect postulates that household spending is tied directly to home value -- when home values rise, homeowners feel wealthier and spend more. This analysis considers assessed values per square foot for primary residences in the Study Area to see whether there is a correlation between home values and spending in the Study Area.

Due to the dramatic change in both retail supply and household demand in the Study Area in 2008, it is most instructive to study sales trends from 2008 to 2010 in order to analyze the relationship between lake levels and total sales. The three-year period between 2008 and 2010 included one severe drought

year (2009) and two normal-level lake years. While sales were the lowest in 2009 as compared to the three year period, factors other than lake levels would have driven sales down during 2009 as well.

In 2009, sales receipts in the Study Area declined by 6.5 percent, in spite of the fact that both the number of households and assessed home values grew in the Study Area. Both household growth and the wealth effect indicate that retail sales should have grown in 2009. However, 2009 was a drought year for Lake Travis and was also the height of the recession. Both lake levels and economic conditions would cause sales to drop, and, in 2009, the combination of lake levels and the recession overpowered any growth caused by the wealth effect or household growth.

When taxable sales are evaluated in conjunction with lake levels and the other economic and demographic pressures that affect sales, there appears to be a correlation between sales and lake levels. In 2010, trends in two of the four key micro- and macroeconomic factors would have been expected to cause a decline in taxable sales. Assessed home values declined by 4.4 percent in 2010, which, according to the wealth effect, could have curbed spending of Study Area residents. Moreover, recessionary pressures were still strong in 2010, which would have made households even more reluctant to spend. However, in 2010, taxable sales in the Study Area grew by 7.1 percent. The number of households in the Study Area grew slightly by 1.4 percent, which could explain some but not all of the growth in taxable sales in the Study Area. Lake level conditions were good throughout 2010, and taxable sales reached their highest levels in five years, even during a continued stressed economic climate, which provides another indicator suggesting sales increased significantly in 2010 when lake levels were higher.

Figure 47: Trends in Retail Sales and Demand Drivers, Lake Travis Study Area (2006 – 2010)

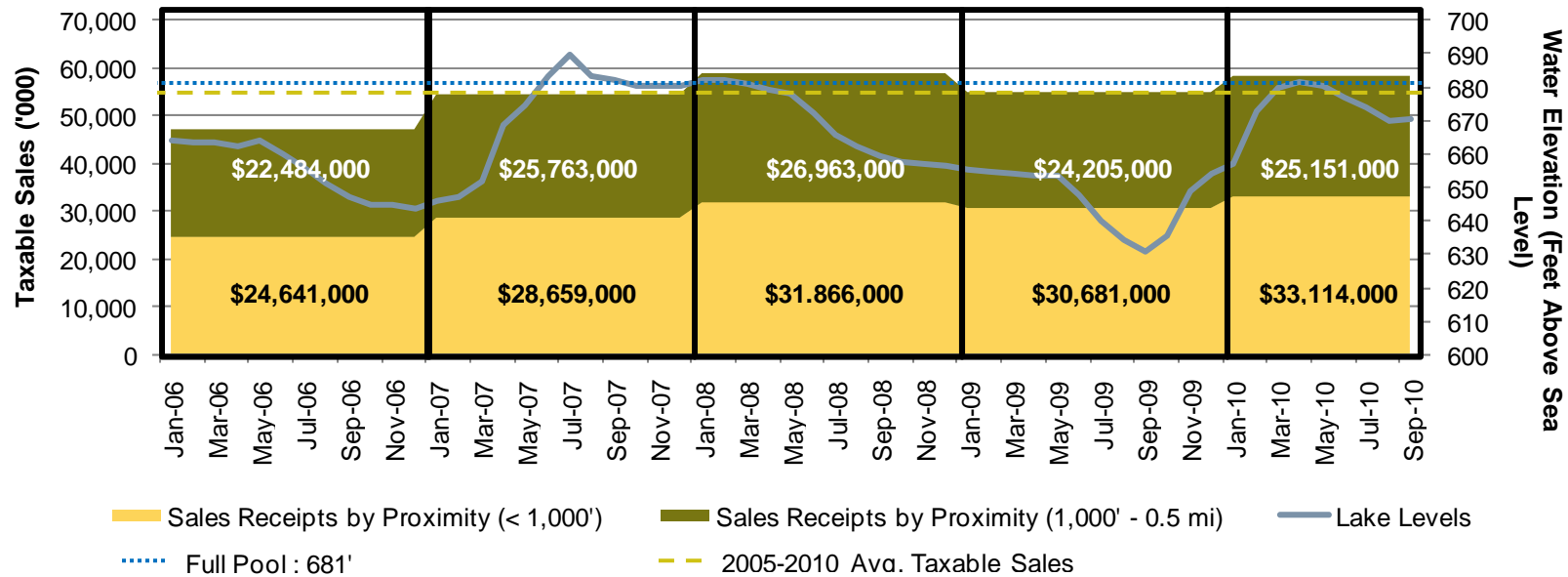
	2006	2007	2008	2009	2010
Sales Receipts					
Sales Receipts - Study Area (\$000's)	\$374,173	\$480,436	\$547,839	\$512,232	\$548,384
Sales Receipts - Study Area - % change YOY	--	28.4%	14.0%	-6.5%	7.1%
Study Area Sales Receipts per Travis County Resident	\$399	\$495	\$549	\$499	\$535
Lake Levels					
Average Annual Lake Levels (Feet Above Sea Level)	655	672	669	647	672
% Days Lake Level Below 660'	55%	24%	31%	100%	8%
Household Growth					
Primary Residential Parcel Count Study Area	10,621	11,110	12,870	13,891	14,086
Annual % Growth in Primary Residential Parcels	--	4.6%	15.8%	7.9%	1.4%
Travis County Population Growth	4.0%	3.5%	3.0%	2.8%	-0.2%
Wealth Effect					
United States Inflation	3.2%	2.8%	3.8%	-0.4%	1.6%
United States Real GDP Growth	2.7%	1.9%	0.0%	-2.6%	2.9%
Assessed Value PSF (Primary Residential Parcels)	\$123	\$131	\$135	\$140	\$134
Annual % Growth in Assessed Value PSF of Primary Residential Parcels	0.0%	6.5%	3.7%	3.4%	-4.4%

An average of \$536 million in sales receipts were recorded annually between 2008 and 2010. Total collections fluctuated between \$12.2 million above average to \$23.9 million below the average. Reasons for fluctuations in sales receipts include lake levels, household growth, wealth effect, etc. RCLCO attributed a weight to each variable that affects sales receipts in order to isolate the effects of lake level fluctuations. This analysis estimates that in normal lake level years – during which time there are no sustained periods of drought or flood – approximately \$8.8 million to \$11.0 million in sales receipts above average will be achieved. This growth in sales receipts translates into an additional \$723,000 to \$908,000 in sales tax revenues above average. Conversely, during extremely low lake level years, such as 2009, approximately \$16.0 million to \$20.0 million in sales receipts will be lost, which translates into a loss in sales tax revenues of \$1.3 million to \$1.7 million, and could also result in store closures and job loss.

RCLCO also analyzed taxable sales for businesses located closer to the lake, working on the hypothesis that businesses that are more lake-dependent are located closer to the lake. If a correlation between lake levels and sales exists, the correlation would be expected to be amplified for businesses located closer to the lake. This study evaluates fluctuations in sales for Study Area businesses that are on the lake (within 1,000 feet of the lake) and near the lake (located between 1000 feet and one-half mile from the lake). Approximately 11 percent of taxable sales in the Study Area are collected from businesses located on or near the lake.

On average, businesses on or near the lake collected \$54 million in taxable sales each year between 2005 and 2010. The two years with the highest taxable sales were 2008 and 2010, which were both good years for water levels – no droughts and no floods. During these two years, businesses on or near Lake Travis earned approximately \$4 million above the average level of taxable sales. In 2007 and 2009, businesses located on or near Lake Travis earned average levels of taxable sales, even though poor lake conditions would not have positively contributed to sales. A summer flood in 2007 and prolonged drought in 2009 contributed to declines in taxable sales; however, the dramatic drop in lake levels in 2009 did not cause an equally dramatic reduction in sales. The lowest taxable sales on or near the lake were during 2006, and growth in Study Area population could have contributed to an overall growth in taxable sales on or near the lake between 2006 and 2010.

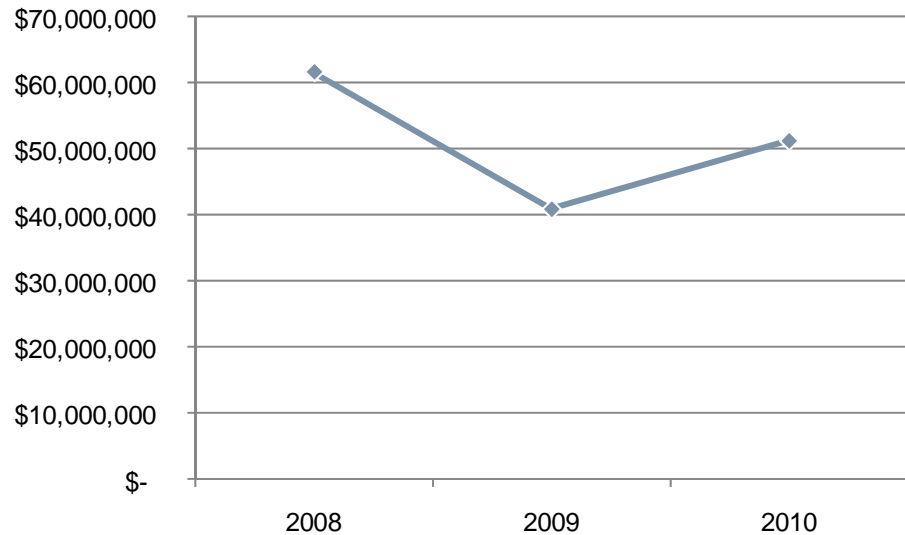
Figure 48: Changes in Sales Tax Revenues, Lake Travis Study Area (2006 – 2010)



Interviews with owners of lake-related business on or near Lake Travis indicated that revenue declined by 34 percent in 2009, which is more significant than indicated by taxable sales data. However, all of the business owners that RCLCO interviewed managed businesses that are totally dependent on the lake, which is not true of all of the businesses that are located within one-half mile of the lake. RCLCO spoke with over 40 owners of marinas, restaurants, hotels, golf courses, recreational facilities, and SCUBA schools in order to understand how lake levels affect business. A detailed summary of effects on Lake Travis businesses follows later in this report. Approximately 10 of the interviewees agreed to share historical revenue estimates, which are

aggregated and shown in Figure 49. The data only show 2008 – 2010 because most of the participating business owners only gave three years worth of data.

Figure 49: Anecdotal Revenue Histories of Lake-Dependent Businesses

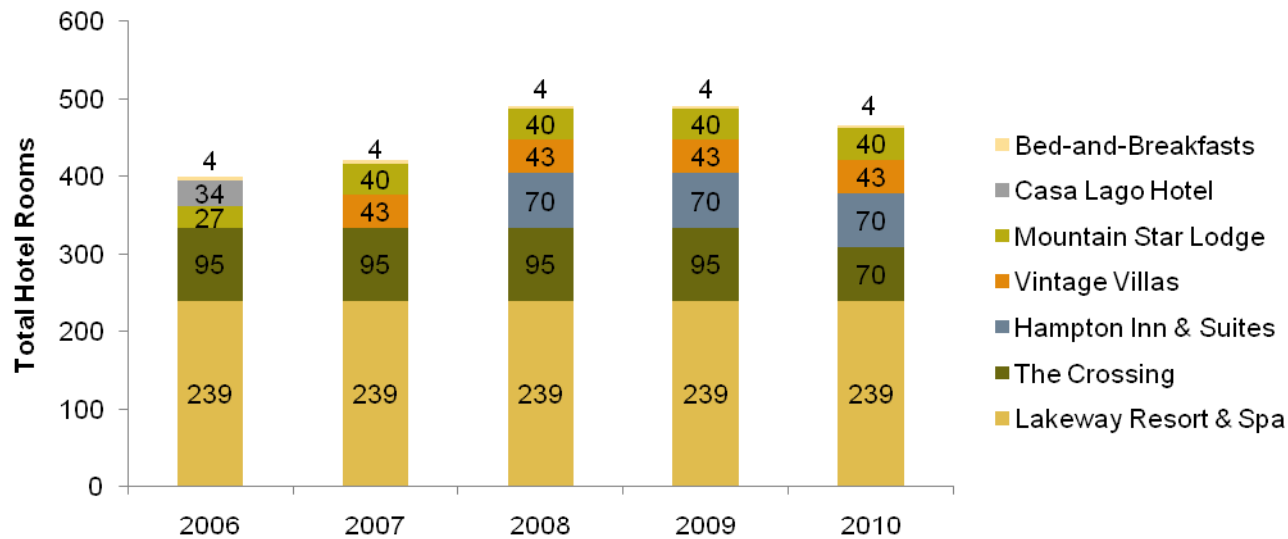


SOURCE: RCLCO Interviews

Lake Travis Study Area Hotel Occupancy Taxes

The Lake Travis Study Area was home to 466 hotel rooms in 2010. Since 2006, the total number of rooms has fluctuated between 399 and 491 based on the construction or closure of hotels. In each year between 2006 and 2008, the number of hotel rooms in the Study Area grew by an average of 46 rooms per year. In 2010, rooms declined due to renovations of the Crossing in Austin. All of these current hotel rooms are located on the eastern portion of the Study Area in Lakeway and Austin.

Figure 50: Total Hotel Rooms, Lake Travis Study Area (2006 – 2010)



SOURCE: Texas Comptroller

Additionally, Lake Travis lake levels and visitation have had a large impact on total hotel revenues. Taxable hotel receipts experienced strong growth between 2006 and 2008, starting at just under \$8.2 million and increasing by an average of \$1.4 million per year, a 16 percent annual increase. In 2009, hotel receipts dropped almost \$1 million to \$10.1 million, a fall of eight percent. As lake levels rose in 2010, so did taxable receipts to a more stabilized level of \$10.6 million, an increase of five percent over 2009.

Based on this data for the whole Study Area, it is hard to determine the total effect that lake levels had on the performance of hotels. However, the most prominent hotel in the Study Area, the Lakeway Resort and Spa, has reported that lake levels have significantly impacted their performance. Taxable receipt data collected by the comptroller indicate that the variations in performance of the Lakeway Resort and Spa have been more pronounced than the overall study area, indicating that lake levels have a definite impact on hotels. Taxable hotel receipts for this 239-room hotel were significantly lower at \$4.8 million in 2006, during which it underwent a management change and a major facelift. After this transition, revenues at the Lakeway Resort and Spa grew by over 22 percent per year through 2008 to reach a peak of \$7.4 million, much higher than the 16 percent growth for the Study Area as a whole. In 2009, as lake levels dropped and the economy entered the height of the recession, this hotel's taxable receipts fell to \$5.9 million, a decrease by 21 percent, which again is significantly larger than the eight percent drop experienced by the Study Area as a whole. In 2010, taxable receipts increased only

LAKE TRAVIS ECONOMIC IMPACT REPORT FINDINGS AND CONCLUSIONS

marginally better than the whole study area, by six percent for Lakeway Resort and Spa compared to five percent for the Study Area. The experience of the Lakeway Resort and Spa in 2009 indicates that lake levels have a significant impact on the performance of hotels within the Study Area, yet the marginal increase in revenues in 2010 suggest only a portion of the drop in 2009 is lake-related.

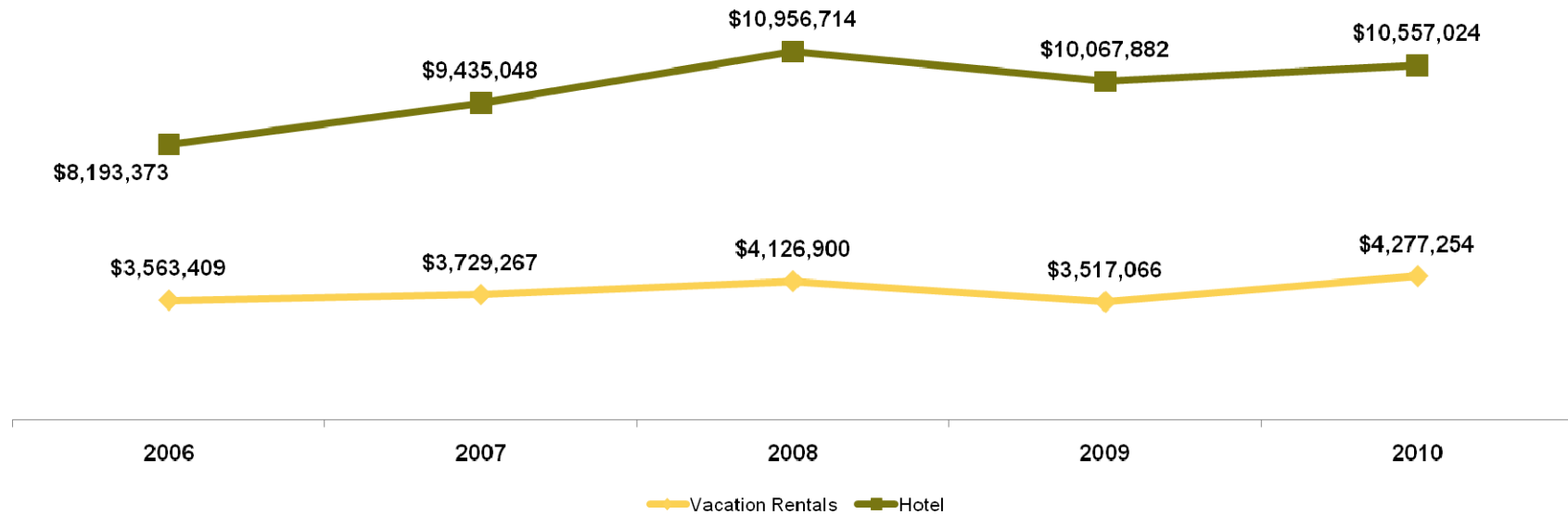
The fluctuating lake levels combined with external factors, such as the recession, fuel prices, and inflation have impacted the performance of the hotels, as evidenced the by fluctuations in taxable hotel occupancy receipts. An average of \$10.5 million in sales receipts were recorded annually between 2008 and 2010. In 2009, one of the worst lake level years in recent history, hotel taxable receipts were \$460,000 below the 2008 to 2010 average. RCLCO attributed a weight to each variable that affects hotel occupancy receipts in order to isolate the effects of lake level fluctuations. This analysis estimates that, in normal lake level years – during which time there are no sustained periods of drought or flood – approximately \$10.5 million in hotel occupancy receipts will be achieved. Lake level decreases, such as those that were in 2009, could result in a decrease of \$344,500 in hotel taxable receipts. The fiscal implication to the state from the reduced hotel occupancy receipts from lake levels is \$20,700.

Vacation rental properties have experienced more variability based on lake levels than hotels as properties can be easily taken on or off the market and thus respond to lake levels more easily than hotels. In 2006, taxable receipts totaled \$3.6 million for the 449 total properties available for rent. As lake levels stabilized in 2007, taxable receipts increased by five percent to \$3.7 million, and total units increased modestly to 464. Lake levels remained at average levels in 2008, yet taxable receipts increased to \$4.1 million (an 11 percent increase), even though total properties fell to 420. Similar to hotel receipts, vacation rental receipts fell drastically to their lowest level in 2009, \$3.5 million (a 15 percent decrease), yet there were still 420 properties in the rental market. Lake levels stabilized in 2010, and as such, revenues experienced their largest increase of 22 percent to a total of \$4.3 million.

Lake levels thus have a significant impact on vacation rentals in the Study Area as variations in rental revenue from year to year are correlated with the water elevation in Lake Travis, yet total properties available in the rental market tend to lag. Companies that manage these rental properties express similar experiences as indicated by the data. These rental professionals described that low lake levels tend to scare prospective renters, which causes cancellations to increase and rental inquiries to drop by an estimated 30 percent. As these prospective renters are scared off, owners of the properties also become worried about how lake levels will affect their properties in the future.

Although vacation rental receipts total only a fraction of the hotel receipts for the Study Area, the lake level impact is estimated to be just as large. Vacation rental receipts averaged just under \$4.0 million between 2008 and 2010. Vacation receipts were \$457,000 below this average in 2009 and the amount attributable to the lake is \$342,500, assuming that external factors affect vacation rentals similarly to hotels. The fiscal implication to the state from the reduced vacation rental receipts from lake levels is \$20,600.

Figure 51: Total Hotel Occupancy Taxable Receipts, Lake Travis Study Area, Hotels and Vacation Rentals (2006 – 2010)



SOURCE: Texas Comptroller

The variations in taxable receipts over this time period had a large effect on public entities, as hotel occupancy tax revenues fluctuate with total taxable receipts. In 2006, total taxes generated by the Study Area hotels totaled \$655,800, with \$491,600 distributed to the state and the remaining taxes going to local taxing entities. As hotel revenues fluctuated throughout 2010, hotel occupancy taxes changed accordingly, increasing to over \$800,000 in 2007 and to \$897,900 in 2008. Hotel tax revenue dropped to \$755,600 in 2009 and increased to a stabilized \$796,400 in the base case year, 2010.

Vacation rental performance peaked in 2008, and taxes generated by this market totaled \$449,700, of which the majority goes to the state (\$247,600), and the remainder goes to local entities in Lago Vista, Austin, and Jonestown. Over the five year time period from 2006 to 2010, hotel occupancy taxes reached their lowest level of \$380,500 during the drought and recession of 2009. The second most recent drought in 2006 also experienced a low level of tax revenues, yet not nearly as low as in 2009. The fluctuations of these total taxes generated by vacation rentals in the Study Area is also affected by where rental properties are located in the Study Area. For instance, between 2007 and 2008, total revenues increased while total properties in the rental market fell by 44 units. However, total units in taxing jurisdictions decreased by more than the increases in non-taxing jurisdictions, allowing the total taxes generated to increase only modestly by one percent, while total revenues increased by 11 percent.

Figure 52: Total Hotel Occupancy Taxes, Lake Travis Study Area, Hotels and Vacation Rentals (2006 – 2010)



SOURCE: Texas Comptroller

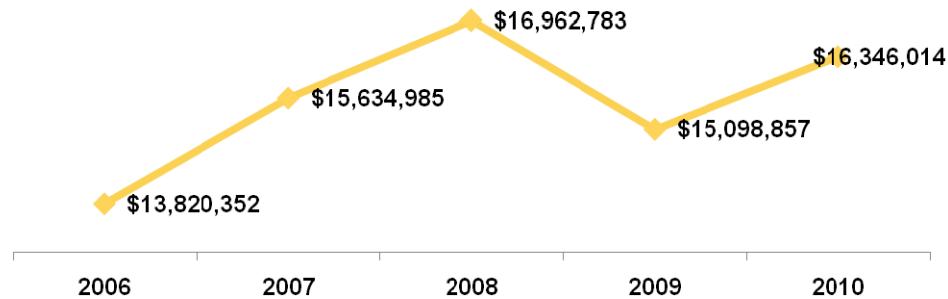
Mixed Beverage Tax

Mixed beverages are a major source of revenue for lake-related businesses. Lake level fluctuations reduce the recreational attraction to Lake Travis and thus also have a significant impact on the sales of mixed beverages. Historically, taxable receipts from the sale of mixed beverages have averaged \$15.6 million between 2006 and 2010. The majority of these receipts in the Study Area have been collected from businesses in Austin (56 percent) and Lakeway (29 percent), with the remaining receipts coming from unincorporated areas, Lago Vista, Cedar Park, and Jonestown.

In 2006, lake levels were depressed to an annual average elevation of 655 feet above sea level, and in this same year total mixed beverage receipts fell to \$13.8 million, their lowest annual amount between 2006 and 2010. As lake levels stabilized in 2007 and 2008, total annual taxable mixed beverage receipts climbed to \$15.6 million and \$17.0 million, respectively. The significant drought in 2009 brought average annual water elevation to 647 feet above sea level, which greatly impacted the ability to use the lake for recreational activities and caused a large decrease in visitation to Lake Travis, thus reducing mixed beverage sales by almost \$2 million to \$15.1 million. Lake levels stabilized again in 2010 to an average elevation of 672 feet above sea

level and mixed beverage sales increased accordingly to just over \$16.3 million. Figure 53 shows the total mixed beverage receipts in the Study Area over this five year period.

Figure 53: Total Taxable Mixed Beverage Receipts, Lake Travis Study Area (2006 – 2010)



SOURCE: Texas Comptroller

Similar to hotel occupancy receipts, only a certain portion of the decrease in mixed beverage taxes can be attributed to lake level fluctuations. Between 2008 and 2010, total mixed beverage receipts averaged \$16.1 million and were \$1.0 million below this average in 2009, a year plagued by especially low lake levels. Assuming development, growth, and the recession collectively account for 25 percent of this decrease, the lake level impact on mixed beverage receipts totals \$777,800. The state collects 14 percent of these revenues and distributes them at the state, county and local levels. The decrease in mixed beverage receipts thus decreases mixed beverage sales tax revenue by a total of \$108,900.

These lower water elevations and decreased mixed beverage sales also create a large impact to taxing entities. Between 2006 and 2010, the state collected an average of \$2.18 million per year from the sale of mixed beverages in the Study Area. During 2007, 2008, and 2010, the years with stable water levels, total taxes averaged \$2.28 million compared to a much lower value, \$2.02 million, in years with low lake levels. Although the changes in taxes are much smaller in magnitude than the fluctuations in total receipts, they have a significant impact on the local economy and show how critical water levels in Lake Travis are to revenue sources generated by lake-related recreational activities. Figure 54 shows the changes in total mixed beverage receipts from 2006 through 2010, as well as the total mixed beverage taxes distributed to the state, county, and local entities.

Figure 54: Total Taxable Mixed Beverage Receipts and Taxes, Lake Travis Study Area (2006 – 2010)

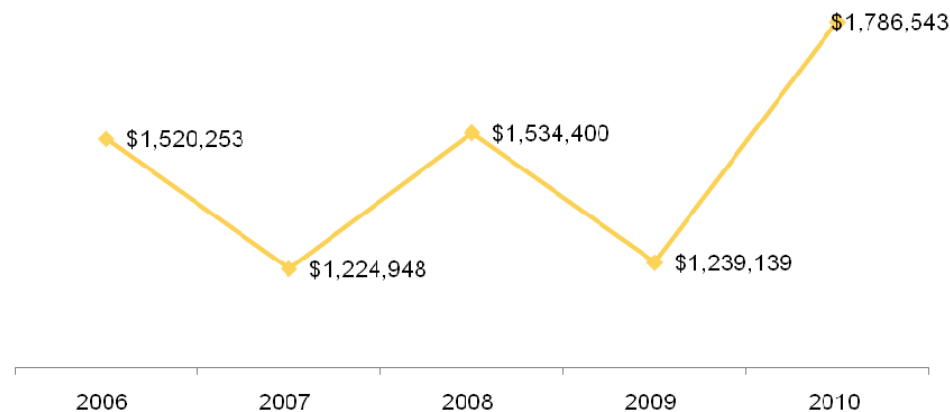
Year	Total Receipts	Total Tax Revenue	State Tax Revenue	County Tax Revenue	Local Tax Revenue
2006	\$13,820,352	\$1,934,849	\$1,520,238	\$207,306	\$207,306
2007	\$15,634,985	\$2,188,898	\$1,719,848	\$234,525	\$234,525
2008	\$16,962,783	\$2,374,790	\$1,865,905	\$254,442	\$254,442
2009	\$15,098,857	\$2,113,840	\$1,660,874	\$226,483	\$226,483
2010	\$16,346,014	\$2,288,442	\$1,798,061	\$245,191	\$245,191

SOURCE: Texas Comptroller

Park Fees

The fluctuations in lake levels between 2006 and 2010 have had a significant impact on the revenues collected by Travis County and LCRA from the public Lake Travis parks. Over this time period, an average of \$1.5 million was collected by these parks each year from the day and annual permits. In 2006, a low lake level year, park revenues were above this average at \$1.52 million. Lake levels stabilized in 2007, but revenues generated by park fees fell drastically to \$1.2 million. This is due to flooding of the lake in June and July of this year, which is during the peak visitation season and forced these parks to close. Lake levels remained at the historical average for most of 2008, and as such, revenues were pretty consistent with the average at \$1.53 million. The severe drought of 2009 resulted in less recreational visitation to the lake, thus reducing park fees to \$1.24 million. Water elevation stabilized again in 2010, and park revenues increased to \$1.79 million as recreational visits to the lake increased.

Figure 55: Total Park Fees by Year (2006 – 2010)



This data indicate that changes in lake level have significant impacts on revenues generated by these public parks. Comparing total revenues in 2006 and 2009 suggests that economic conditions may have a larger impact on park revenues and visitation than lake levels. Lake levels in 2006 and 2009 were very similar, between 15 and 22 feet below full pool, respectively. However, during the economic recession of 2009, park revenues were \$281,000 below their 2006 level. Comparatively, high lake levels in 2007 caused an even larger discrepancy between park revenues, which were \$295,000 below their 2006 level. Thus, flooding and high lake levels have a larger impact on park revenues than do low lake levels, as flooding eliminates park visitation during park closures while low lake levels do not prohibit the visitation of these public parks in any way.

D.2. Economic Impacts of Lake Level Fluctuations

This section considers the economic impacts associated with fluctuations in direct spending. The analysis begins by evaluating if and how much visitation changes due to excessively low or high lake levels. Next, this section considers the historical fluctuations in direct spending from 2006 to 2010 and identifies whether correlations between lake levels and spending exist within each category. Finally, this section provides an estimate of the economic impact associated with growth and decline in direct spending.

Visitation Trends

Visitors to Lake Travis include boaters, park visitors, vacation renters, and second-home owners. The base case analysis shows that Lake Travis had 2.8 million visitor-days in 2010, 18 percent of which were park visitor-days. This section considers visitor spending shifts in conjunction with changes to water levels in Lake Travis. Historical visitor data is unavailable for Lake Travis in any of the visitor categories except for park visitors; therefore, this analysis uses trends in park visitor-days as a proxy for all visitation trends to Lake Travis.

Park Visitors

Stakeholder interviews indicate that lake levels and economic conditions are the primary factors affecting park visitation. Both Travis County and LCRA have tracked visitation to the public parks surrounding Lake Travis from 2006 to 2010, which provides an interesting backdrop to the lake level analysis. According to this data, there was an average of 450,800 visitor-days at these parks each year over the five year time frame.

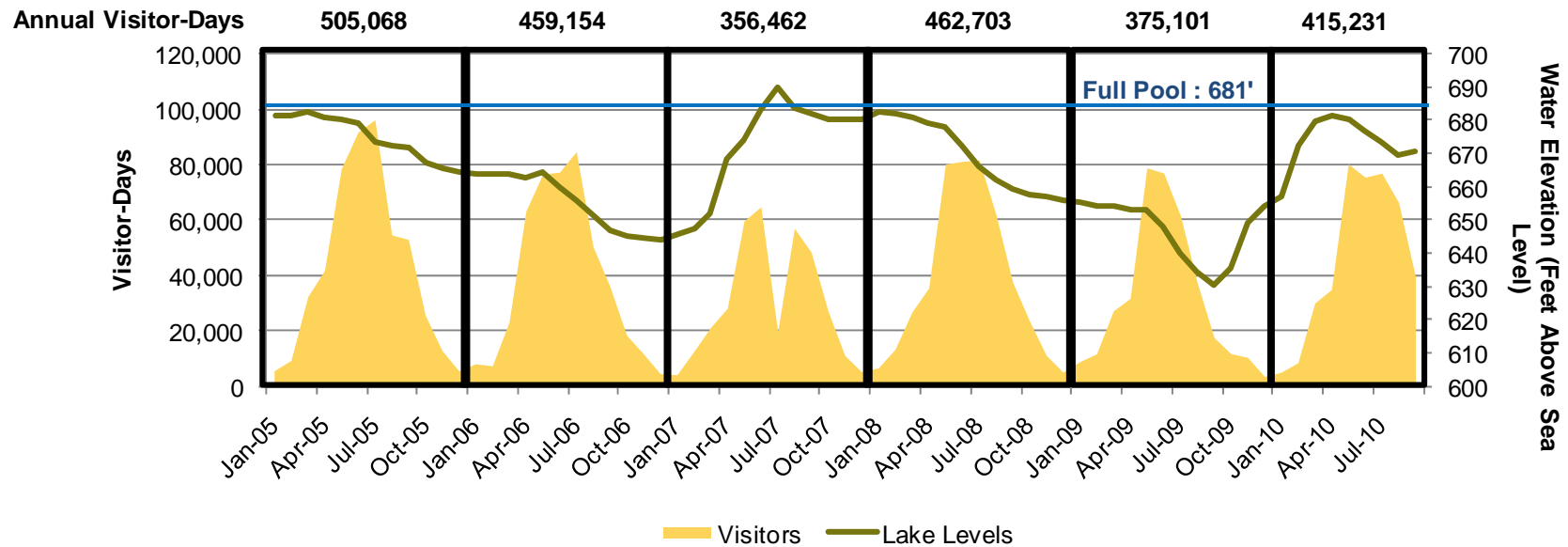
In 2007, there were an estimated 378,400 visitor-days at these parks, which is well below this average even though lake levels were relatively stable this year. However, during the peak season in June and July, when most visits to the lake occur, water elevation rose to 686 feet above sea level because of flooding. This caused the closure of the public parks and reduced the number of visitor-days in this year by 104,800 compared to 483,300 in the low lake level year of 2006.

In 2008, lake levels were at their fifty year historical average of 670 feet and visitation was high at approximately 491,303 visitor-days. As lake levels dropped in 2009 to an annual average of 647 feet above sea level, so did visitation to 400,900 visitor-days, a decrease of 18 percent. Lake levels rose to an annual average of 672 in 2010, and visitation increased by 25 percent to 499,900.

Lake Travis was experiencing droughts in both 2006 and 2009 and lake levels were relatively similar at 655 and 647 feet above sea level, respectively. However, as seen in Figure 56, water levels dropped more and with greater velocity in 2009 as compared to 2006. In 2006, Lake Travis dropped 20.4 feet over between June and December, an average decline of 2.9 feet per month. In 2009, the lake dropped 22.7 feet between June and September, an average decline of 5.7 feet per month. The 2009 drop resulted in the lowest water levels experienced in the lake in a decade. However, the 2006 drought occurred gradually, and from May to July, during the peak months of summer, the lake remained above 655 feet. In 2009, lake levels remained below 655 feet from February through the end of the year. Visitation dropped dramatically to 400,900 visitor-days in 2009, whereas in 2006, visitor levels remained stable at 483,300 visitor-days.

Comparing visitation to lake levels from 2006 to 2010 indicates that lake levels have a clear impact on visitation, and both extreme droughts and flooding cause visitation to drop. Lake Travis can support between 460,000 to 500,000 park visitor-days in years when lake levels remain between 660 to 680 feet. In years with extreme drought or flood conditions, such as 2007 and 2009, park visitation numbers fell to 350,000 to 375,000. Using park visitors as a proxy for all visitors suggests that when lake levels drop or rise for an extended period of time such that the lake use is extraordinarily restricted, as occurred in July 2007 and during the summer of 2009, visitation levels can drop by 14 percent to 20 percent from the average annual rate of 2.8 million visitor-days, which translates into decline in 362,000 to 560,000 visitor-days per year. During years when the lake levels remain stable throughout the summer, such as 2006 and 2008, visitation rate exceeds the average by seven percent, which translates into 196,000 more visitors per year. In 2005, lake levels remained between 664 feet and 684 feet for the entire year, and visitation levels exceeded average rates by 15 percent.

Figure 56: Lake Travis Park Visitation and Lake Levels (2005-2010)



Economic Impacts of Fluctuations in Visitation

Lake levels have a clear impact on direct spending by visitors on Lake Travis. Major fluctuations in lake levels, from either a drought or a flood, can drop visitation and spending by 14 percent to 20 percent. The economic impact of this decreased spending results in losses of over 240 jobs and a total impact of \$12.6 million on an annual basis (assuming 20% drop). Stable lake levels, defined as elevations between 660 feet and 681 feet (“full pool”) above sea level, can increase visitation and spending by seven percent to 10 percent, resulting in an economic boost of up to 125 jobs and \$7.1 million in value annually. If Lake Travis lake levels break historical records and maintain a state of drought or flood for longer periods than ever experienced, visitor levels can be expected to drop more than the historical record of 20 percent. If visitor levels drop by half, the resulting economic impact could result in losses of up to 583 jobs and a total impact of \$33.5 million on an annual basis.

Figure 57: Economic Impacts of Fluctuations in Visitation

Visitor Category	Spending	Jobs Impact			Total Impact				
	Base Case	Base Case	+10% Visitation	-20% Visitation	-50% Visitation	Base Case	+10% Visitation	-20% Visitation	-50% Visitation
Boaters	40,011,202	574	7	-14	-35	\$30,266,000	\$349,000	-\$96,000	-\$1,744,000
Park visitors	38,038,236	294	29	-58	-145	\$15,881,000	\$1,589,000	-\$2,889,000	-\$7,854,000
Vacation renters	32,556,930	309	45	-83	-187	\$21,348,000	\$2,905,000	-\$5,391,000	-\$12,426,000
Second homeowners	58,187,203	431	43	-86	-215	\$23,002,000	\$2,301,000	-\$4,226,000	-\$11,501,000
Total Visitor Spending	168,793,571	1,607	125	-241	-583	\$90,497,000	\$7,144,000	-\$12,602,000	-\$33,525,000

Boaters

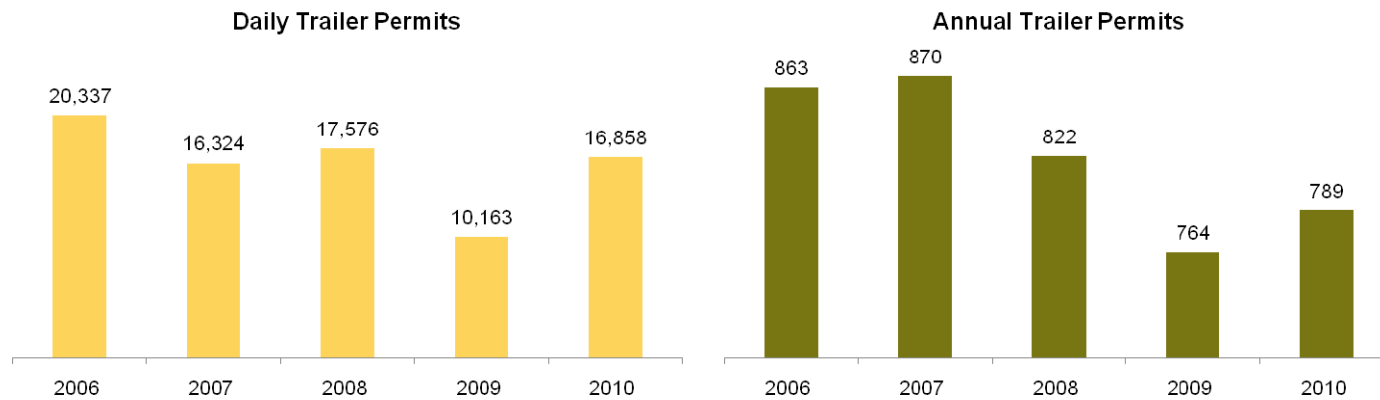
Boating in the public parks surrounding Lake Travis between 2006 and 2010 is estimated based on the daily and annual trailer permits issued by Travis County and LCRA. Daily boat trailer permits have averaged 16,300 over this five-year time period, peaking at 20,300 in 2006. Daily boating at the public parks dropped dramatically in 2007 to 16,300, which is most likely due to the closure of the parks in June and July from flooding. Lake levels stabilized in 2008 and daily boat usage rose to a stabilized level of 17,600. As expected, the drought and recession in 2009 decreased daily boat usage to its lowest level of 10,200. Boating rose again, but to only 16,900 permits in 2010 as lake levels reached the historical average.

These changes in daily boat permits over the five-year time period suggest that both lake levels and economic conditions have a large impact on boating on Lake Travis. The high number of boaters is strange for the low lake level year of 2006, but looking at permits for individual parks paints a different picture. While lake levels dropped, boaters moved between parks with shallow water to parks in deeper channels as evidenced by Cypress Creek permits dropping from 3,200 permits in 2005 to only 17 in 2006 and Mansfield Dam permits increasing from 9,300 to 11,600. Although lake levels in 2006 did not affect total boating on the lake as drastically as was expected, they had a definite impact on where the boating took place. The drop of daily boat usage in 2007 indicates that flooding significantly reduces boating because boaters cannot access the public ramps. The subsequent drop in 2009 suggests that boating decreased significantly, and the marginal increase in 2010 to less than the stabilized 2008 level suggests that economic conditions played a larger role in the 2009 decrease than did low lake levels.

Annual boat permits at the public parks exhibit slightly different trends than daily boat permits. In 2006, there were 863 annual trailer permits issued, which is relatively high given that this is a low lake level year. However, individual park data show that the number of permits remained high because certain parks experienced a large decrease (Cypress Creek), while parks in deeper water (Mansfield Dam) absorbed the losses felt by other parks. Permits remained relatively constant in 2007, which is likely because these permits are valid for an entire year and people cannot be able to foresee short periods of extreme water level fluctuation, as was the case in June and July of 2007. Annual permits fell slightly in 2008 to 822, and fell even more dramatically in 2009 to their lowest level of 689. Annual boat permits rose in 2010 to 789, which is still below the number of permits in 2006 through 2008.

The drop in annual trailer permits in 2009 and increase in 2010 suggests that annual permit holders are more sensitive to lake levels, yet it is important to note that the decrease in annual permits in 2009 may have resulted in previous annual permit holders foregoing to renew their annual permits and instead opt to purchase individual daily permits because of the uncertainty of lake levels. This analysis combined with the daily boat permits suggests that the perception of lake level changes has a larger effect on boating than the actual water levels themselves.

Figure 58: Daily and Annual Trailer Permits, Lake Travis Public Parks (2006 – 2010)

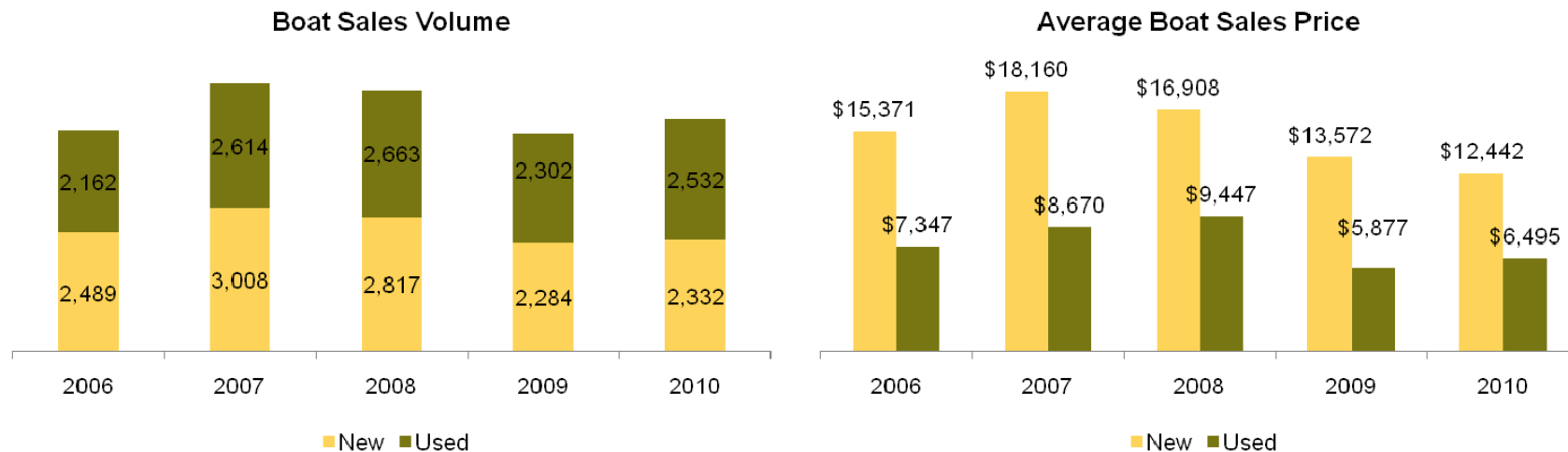


Economic Impacts of Fluctuations in Boater Spending

Spending by boaters supported a total of 574 jobs in Travis County in 2010, with total wages of \$19.1 million, and total value added of \$30.3 million. A 10 percent gain in visitation is expected to result in an estimated gain or loss of seven jobs, \$215,000 in wages, and \$349,000 in total value. Likewise, a 20 percent drop in visitation could result in a loss of 14 jobs and \$96,000 in total value.

Boat sales in Travis County are primarily driven by Lake Travis, and as such we expect lake levels to have an impact on boat sales. Texas Parks & Wildlife Department tracks the number of new and used boat sales in Travis County and Texas, as well as the aggregate value of these boat sales. Between 2006 and 2010, Travis County comprised an average of just over 5,000 boat sales per year. In 2006, 54 percent (2,490) of total sales were new boats, and the remaining 46 percent (2,160) are classified as transfer of used boat ownership. As time progressed, new boat sales as a portion of total sales steadily decreased as people started purchasing more used boats, which are usually less than half the price of new boats.

Figure 59: Boat Sales and Average Boat Price by Sale Type, Travis County (2006 - 2010)



In the low lake level years of 2006 and 2009, boat sales suffered and totaled 4,650 and 4,590, respectively, which is well below the average sales volume of 5,320 in the stable lake years of 2007, 2008, and 2009. Boat sales in Travis County peaked in 2007 at 5,620 and declined slightly in 2008 to 5,480. In 2009, boat sales fell drastically to 4,590 and actually increased in 2010 to 4,864. Additionally, average sales prices of both new and used boats were lower in lake level years compared to stable years. This data seem to point to a direct effect of lake levels on boat sales, but the economic recession of 2009 skews the interpretation of this data.

To control for this, we can compare the trends of boat sales in Travis County to all boat sales in the state of Texas. In all of Texas, boat sales averaged 137,200 sales each year between 2006 and 2010. In 2006, boat sales were relatively high at 140,500, only 100 less than in 2007. As the economy began to suffer, boat sales steadily declined in 2008 through 2010 to just under 130,000 total sales. Over this time period, the proportion of used boat sales has

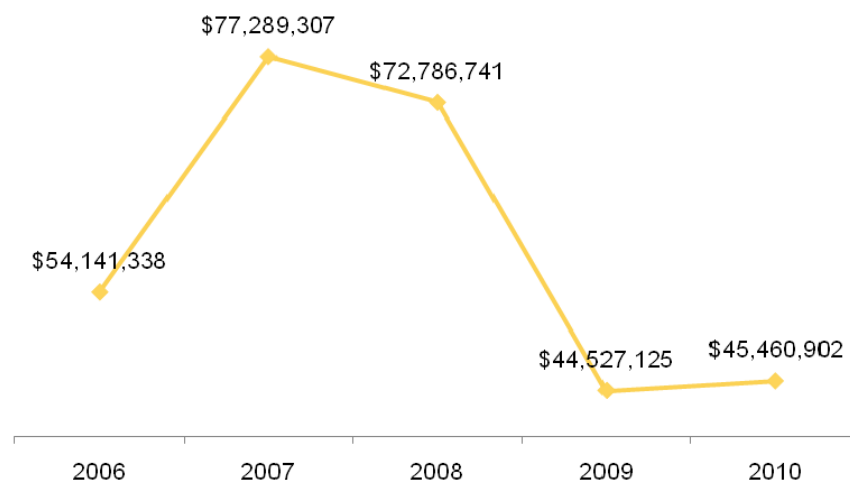
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been growing, which is consistent with the experience of the County. Average boat prices are lower for the state than Travis County, yet used boats are still selling at less than half the price of new boats.

In 2006, 3.3 percent of all boat sales in Texas were located in Travis County. As lake levels increased in 2007 and stabilized in 2008, Travis County boat sales increased to 4.0 percent and 3.9 percent of total sales in the state. In 2009, the recession impacted sales in both Travis County and the state of Texas as Travis County sales only accounted for 3.4 percent of total sales. Sales increased in Travis County in 2010, but Texas boat sales declined significantly, increasing Travis County's capture to 3.7 percent of sales. From this comparison, it is clear that Travis County boat sales are driven by water elevations in Lake Travis.

Including changes in prices with the sales volume fluctuations shows a different interpretation of boat sales. Aggregate value of boat sales averaged \$58.8 million between 2006 and 2010 and started below this average in 2006 at 54.1 million. As sales shot up in 2007, so did average prices, increasing total value of boat sales to \$77.3 million. Sales prices decreased slightly in 2008, and this combined with the decrease in sales volume in this year brought down aggregate sales by \$4.5 million to \$72.8 million. In 2009, sales volume dropped dramatically, as did sales prices, and aggregate value fell to its lowest level at \$44.5 million. In 2010, sales increased by almost 300, but aggregate value increased by less than \$1 million due to a decrease in average boat prices. This data is consistent with the conclusion that lake levels adversely impact boat sales, but the experience in 2010 indicates that the boat market is still feeling the effects of the recession in the form of depressed prices.

Figure 60: Aggregate Value of Boat Sales, Travis County (2006 - 2010)



To better determine direct effects of lake levels on boat sales, we conducted interviews with several new and used boat dealerships servicing Lake Travis. The overall consensus is that low lake levels are the primary cause of reduced demand for new and used boats by residents and visitors. These behavioral changes were felt by boat dealerships as they estimate a 50 percent decrease in revenue from low lake levels. Additionally, the lack of demand for boats during lake levels created employment losses of 35 full, part-time, and seasonal workers at the four dealerships interviewed. Furthermore, the second most relevant contributing factor that hampered recreational spending, as reported by these businesses, was the general market recession.

These businesses were not only affected in terms of depressed revenues, but low lake levels caused dealerships to incur substantial expenses. With ebbing water levels, these dealerships needed to procure trailers to haul dry-docked boats to water. The reported average one-time expense for these trailers is \$275,000, which resulted in an even more pronounced effect of lake levels on profits and performance. Based on these interviews and the previously presented data, it is clear that water levels and the perception of low lake elevations are an important factor driving boat purchases and sales.

D.3. Effects on Lake Travis Businesses and Utilities

Lake Travis supports a variety of businesses that rely upon the lake and thrive most in years when lake levels are stable. RCLCO conducted one-on-one interviews with forty stakeholders who own and manage businesses on or near Lake Travis in order to better understand how lake levels affect revenues, expenses, employment, and overall viability for different types of businesses. The following section summarizes anecdotal information collected from stakeholders, and, when available, provides quantitative trends for different business types.

Perception of Lake Travis being closed for business was the lake level effect that was raised most frequently by local business owners. Local businesses indicated that media reports of low water levels cause cancellations in boat charter rentals and reductions in demand for lake recreation activities, and keep visitors from Houston and Dallas from making the trip to Lake Travis.

For many Lake Travis businesses, floods can be as damaging to revenues as droughts. When Lake Travis floods, many businesses are forced to close due to high water levels and the subsequent clean-up. A flood in July 2007 forced some marinas, restaurants, and recreational facilities to close for a month during the busiest time of the year.

Many lake-dependent recreational businesses have maintained revenues and stayed afloat during low water level years by diversifying their business offerings. Kayak rental operators expanded online sales, SCUBA outfitters taught swimming lessons in dive-training pools, and restaurants opened souvenir stores. The entrepreneurial spirit of local businesses has helped local businesses overcome what could otherwise have been crippling loss due to drought.

Marinas

Lake level fluctuations directly affect the local marinas, which must move their docks to adjust for fluctuations in the water level. As lake levels increase, marinas need to adjust their docks to ensure that the boats and marinas will not be harmed by the excess water. In the most extreme cases, marinas may even need to close if their docks become overflowed, thus not allowing any access to the boats. As lake levels decrease, marinas need to make more major adjustments to allow for their tenants to continue using their slips. While marinas in deep channels of Lake Travis only have to make smaller scale adjustments when lake levels are low, marinas in shallow channels or narrow coves are required to move their marinas much further out into the lake.



Marshall Ford Marina, Main Basin, Drought Lake Level

**Photos Courtesy of Griffin Communication*



Marshall Ford Marina, Main Basin, Normal Lake Level

According to interviews with marina owners, the majority of marinas will need to make larger adjustments or move their marina completely when lake levels begin dropping below 650 to 655 feet above sea level. The costs associated with moving these marinas includes extending infrastructure, such as power and sewage lines, as well as making sure the docks are still accessible and safe. Most Lake Travis marinas have adequate in-house staff to complete the lake level adjustments without hiring additional employees. However during severe droughts, as was the case in 2009, some marinas could not complete the move internally and needed the assistance of additional employees or third-party companies. These costs can range from \$10,000 to \$50,000 for simple moves and adjustments and can increase to over \$300,000 for marinas in shallow water that need to make substantial moves.

Although marinas must incur substantial costs to move infrastructure and facilities during drought periods, these are not considered economic impacts as the dollars spent to make the moves are done so locally and benefit other businesses, thus making the impacts neutral.

Although the costs for marinas can fluctuate drastically as water elevations increase and decrease, most marinas do not experience a change in slip revenue as occupancy rates are not completely affected by the change in lake levels. Most marinas around Lake Travis have a stabilized occupancy between 85 percent and 90 percent, and marinas in deep channels, with minimal low lake level costs, have reported very little dips in occupancy rates during droughts. In some cases, the marinas that are successful in dealing with low lake level seasons may even increase occupancy during droughts, as boat owners would rather know that their boat is safe in a deep channel than worry about how they will access their boat if lake levels drop below a certain level. On the other hand, marinas in shallower channels and narrow coves report that occupancy can drop to almost half of stabilized levels, decreasing slip revenue while maintenance costs have increased due to the move. Thus, the effect of lake levels tends to vary based on location. Marinas in shallow water are more adversely impacted by low lake levels, while better located marinas benefit as they capture business from their less favorable counterparts. Should low lake levels become persistent, it is reasonable to conclude that marinas would likely suffer from increased vacancy as boaters will likely lower their amenity value of the lake as their number of boating trips decrease with more hazardous lake conditions.

Concessions

A major revenue source for Lake Travis marinas are ship stores and fuel stations. In some cases, these two services are provided in the same business but are considered separate revenue streams. A ship store is a convenience store located on the edge of a marina that allows patrons of the lake to purchase food, beverages, and other recreational retail goods while they are boating. The marina fuel stations provide easily accessible fuel pumps for boats on the lake. Although these businesses are located in private marinas, they are open to everyone boating on Lake Travis.

Interviews with marina owners revealed that both fuel sales have a stronger correlation with lake levels than do ship store sales. One large marina on Lake Travis says that fuel sales have averaged between \$500,000 and \$600,000 during regular lake levels but can drop to as low as \$200,000 if boat use has decreased because of low water elevations. However, the implications in this drop in revenue on profits is not severe, as the cost of the fuel station will vary based on how much total fuel is purchased throughout the year. Another very popular marina stated that ship store sales were actually higher in 2009, a low lake level year, than in 2010, a stable lake level year. The experience of this marina indicates that ship store sales may not have a direct correlation with boating and lake levels, yet anecdotal evidence from other marinas indicates that ship store sales have suffered due to low lake levels. Since most concessions are located in marinas on Lake Travis, they experience similar effects of lake levels. Concessions located near more shallow water are less accessible, and this may deter boaters from stopping to make purchases. This allows concessions in better located marinas to capture a larger portion of retail sales from boaters on the Lake, and thus dampen the impact of lower lake levels.

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Boat Rental

RCLCO interviewed owners of kayak rental, charter boats, and other boat rental businesses in order to understand the effects of water levels on the boat rental industry on Lake Travis. All of the boat rental interviews indicated that low water levels have significant negative impacts on revenues and supportable employment. When water levels drop below 655 feet (a 25-foot drop in water levels), kayak rental companies experience a 35 percent to 40 percent reduction in business. For boat charter companies, the lake level is the most important contributor to business success.

Lake Travis is the biggest local market for kayaking. Boat rental companies on Lake Travis sell and lease kayaks as well as fishing accessories for kayak fishing, which is one of the fastest growing water sports across the country and locally. Lake Travis is a deep lake that is shallow at the edges; therefore, a small decline in water level creates a dramatic increase in shoreline, which is rocky and unpleasant to walk on. When water levels drop, kayak renters must carry their kayaks from the rental dock to the water over the rocky shore. Some kayak companies solve for this issue by increasing rental fleet at marinas in deeper coves and using trailers to truck kayaks to the water in the morning and returning them to the docks in the evening. Nonetheless, Lake Travis kayak rental business declines when water levels drop, with some of the kayak rental business going to Lake LBJ and Lake Austin. Reduced business is reflected in employment, and one large boat rental company reported staffing reductions of 30 percent to 50 percent in 2009 due to low water levels.

Some of the kayak companies on Lake Travis have hedged against water level drops by diversifying their businesses to include sales, both online and in-store. Kayak rentals represent as little as 10 percent of revenues for some local businesses. For diversified businesses, online sales offset the loss in business from reduced kayaking activity on Lake Travis during low water level years.

Boat charter companies are highly exposed to the risk of water levels falling, and charter boat owners name lake water levels as the single most important factor for business. Large charter boats are rented for weddings, corporate parties, and other events. When water levels drop, so too does demand for charter boat rental. Using one of the larger boat owners as an example, a typical year sees six to eight chartered cruises per month. In 2009, a drought year, the same owner launched only 12 cruises.

Restaurants

RCLCO interviewed land-based, waterfront, and floating restaurants located on and near Lake Travis in order to assess impacts of water levels on business. Restaurant owners report a decline in business due to an overall reduction in visitation during low lake level years. Additionally, for the floating and waterfront restaurants, low lake levels make serving boats from docks untenable because docks were inaccessible during low water level years. Interviews indicated that boats account for 40 percent to 50 percent of traffic in a typical year, and a 25-foot drop in lake level eliminates most boat parking.

Many Lake Travis restaurants have diversified their offerings to include a store, gas pumps, and other goods and services that can help offset reduced restaurant demand during low lake level years. Interviews indicate that restaurant revenues fell 20 percent from average during 2009 due to drought conditions. Flooding is equally damaging to waterfront and floating restaurants on Lake Travis. Floods in July 2007 caused some restaurants to close for the month of July, which is typically one of the highest grossing months for waterfront businesses.



*Walkway to Hurst Harbor Marina & Johnny Fins, Normal lake level
Photos courtesy of Griffin Communication

Walkway to Hurst Harbor Marina & Johnny Fins, Drought Conditions

SCUBA

SCUBA operator revenues are severely impacted by lake levels due to perception, access, and depth of water. When lake levels are low, there is a perception that diving cannot happen in the lake and overall demand goes down. SCUBA operators report that this perception is unfounded. Business operations are not materially affected until the lake levels drop 25 feet because the diving platform, which is at 30 feet below lake level, is no longer underwater, and divers must walk across the rocks on the shore to get to the water. Once the platform becomes unusable, the SCUBA outfitters must build a platform in deeper water.

Low water levels also impede deep water training required to earn and maintain technical diving certificates. Dive shops across Texas send their employees to Lake Travis for technical diving classes. Typically there are 50 to 60 technical training students each year, only 15 percent of which are from

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Austin. Each student buys approximately \$10,000 in technical equipment and spends eight weekends in Austin to complete the class. Part of the technical training requirement is a 130-foot deep dive, which cannot be done in Lake Travis once water levels fall more than 40 feet.

Dive shop operators also report that decline in water quality of Lake Travis has affected local businesses. In 1993, there were 13 dive shops in Austin. Today there are three. This drop is largely due to water quality and reduced visibility under water.

Like many other lake-dependent businesses, SCUBA operators have started to diversify their business offering by teaching swimming lessons in their pools to maintain revenues when demand for SCUBA declines.

Public Utilities

At low lake levels, some community and municipal water utilities may be unable to pump water to provide basic municipal service. Approximately 23 utilities currently utilize Lake Travis's water supply.¹⁰ As lake levels drop, pumping and water treatment become more expensive. Some of the utility costs are major expenses, such as adding or extending a barge, buying new pumps, or relocating or reconstructing raw water intakes. In response to the 2011 drought, the cities of Cedar Park and Leander are currently evaluating bids to move the utility's intake pipe into deeper waters of Lake Travis, the cost of which is estimated at \$4.5 million. Other expenses and revenue losses are incurred more regularly when lake levels drop. For example, utilities must use more electricity for pumps when lake levels drop. For example, for WCID17, every 10 foot drop in lake levels results in an estimated \$1,000 per month in additional electricity charges incurred. Although the exact figures are not available, elevated electricity expenses were reported by other utilities that had to relocate their respective intakes.

E. WATER QUALITY

Basis for Water Quality at Lake Travis

Lake Travis is considered one of the clearest lakes in the state of Texas and has been able to maintain its exceptional water quality due to the regulation and monitoring of pollutants. In addition to federal laws governing pollution control and water quality, the Texas Commission on Environmental Quality

¹⁰ The following utilities utilize Lake Travis: City of Austin, City of Cedar Park, City of Lago Vita, City of Leander, City of Round Rock, Hurst Creek Municipal Utility District, Inverness Point Utility System, Jonestown Water Supply Corporation, Lakeway Municipal Utility District, LCRA West Travis County Regional Water System, Travis County WCID 17, Village of Briarcliff, WCID 10, Windermere Oaks Water System Corporation, Hamilton Creek, Quail Creek, Ridge Harbor, Sandy Harbor, Smithwick Hills, South Road, Spicewood Beach, Sunrise Beach, and Whitewater Springs.

(TCEQ) and the Lower Colorado River Authority (LCRA) maintain regulations on water quality. The state of Texas regulates the quality of its streams, rivers, lakes, and bays under the Texas Surface Water Quality Standards of the Texas Water Code. The Clean Rivers Program, administered by the Texas Commission on Environmental Quality (TCEQ) in conjunction with regional water authorities, sets goals to monitor water quality, and identify and evaluate causes of pollution. The data obtained through consistent monitoring of water quality provide a basis for effective policies that promote protection, restoration, and wise use of surface water.¹¹ The Highland Lakes have additional protection from the Highland Lakes Discharge Ban, which prohibits the discharge of pollutants, including treated wastewater, into the Highland Lakes. Wastewater treatment plants that were active before the implementation of the ban in the late 1980s are allowed to discharge into the lakes, but no new discharge is allowed.

The LCRA is the lead agency which manages and regulates water supply and quality of the Highland Lakes chain of reservoirs on the Colorado River. LCRA manages water quality of the Colorado River and tributaries through its participation in the Texas Clean Rivers Program, the enforcement of the Highland Lakes Watershed Ordinance, and its Water Quality Permit Review Program. Additionally, cities in the Study Area and in Travis County unincorporated areas also regulate, control, and enforce requirements to protect Lake Travis water quality through stormwater runoff management and other regulations. The Highland Lakes Watershed Ordinance requires approvals of building permits or written notification to LCRA for all land modification activity within the Lake Travis watershed in Travis County. LCRA is also involved in the review of permit applications submitted through other regulatory agencies. The Application Review and Response Process (ARRP) committee of LCRA examines permits to identify potential threats to water quality and address any concerns.¹² These water monitoring programs and policies continue to be crucial in maintaining Lake Travis' clarity and quality.

Threats to Water Quality

The leading pollutants and stressors causing diminished water quality of lakes include nutrients, metals, siltation, dissolved solids, oxygen-depleting substances, excess algal growth, and pesticides. According to the EPA, a national assessment of the nation's lakes revealed that nutrients are the most common pollutants affecting assessed lakes, and the most widespread source of impairment in the nation's lakes, reservoirs, and ponds is agriculture.¹³ Other leading sources of water quality impairment for lakes are municipal point sources and urban runoff.

Lake pollutants can be categorized into "point source pollution" and "nonpoint source pollution." Point source pollution, or pollution that is discharged directly from a defined place such as an industrial or sewage treatment plant, is currently regulated by the Highland Lakes Discharge Ban. Nonpoint

¹¹ Texas Commission on Environmental Quality

¹² Lower Colorado River Authority

¹³ United States Environmental Protection Agency, 2003 Water Quality Report

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source (NPS) pollution results from land runoff, precipitation, and atmospheric deposition and can originate from a variety of sources. Rainfall or snowmelt moving over and through the ground picks up and carries away natural and human-made pollutants which are eventually deposited into lakes, rivers, and other bodies of water. Pollutants can originate from fertilizers, herbicides and insecticides, oil, grease and toxic chemicals from urban runoff and energy production, salt from irrigation, acid drainage from mines, and leakages from septic systems.¹⁴ The Highland Lakes Watershed Ordinance helps to control NPS pollution by requiring the removal of 70 percent of the pollutants that result from development.

Effects of Impaired Water Quality

The buildup of pollutants can result in severe environmental and human health concerns as well as ruin the beauty of clean water sources. Water quality is especially crucial at Lake Travis since the lake serves as a source of drinking water for residents in Travis County and is a popular recreational destination. In addition, the lake supplies water for commercial establishments, residences, public offices, industries, institutions, and agricultural irrigation.

As part of this study, we were tasked with addressing the economic impact that water quality degradation might have on the local economy. There are several distinct sectors of the economy that could be impacted by water quality degradation, including tourism and recreation-related activities, real estate, and manufacturing (agriculture is another sector that would likely experience impacts, but the majority of agriculture impacts are downstream and outside of the study area). Water quality to date, however, has been consistently good at Lake Travis (there has reportedly been minor degradation of clarity since the lake's founding), and, with the exception of flood events that temporarily elevate pollutants in the lake (and close some lake facilities), as well as reportedly higher turbidity levels at lower lake elevations (due to shallower, cloudier waters), there are no historical records or data that demonstrate the impacts that poor water quality has had on these industries.¹⁵ Given the lack of any data related to changes in visitation, increases in manufacturing costs, property value losses, or other negative impacts due to poor water quality, RCLCO conducted interviews with businesses across each of these industry sectors, evaluated previous studies regarding recreational users of Lake Travis, and analyzed case studies of other lakes to gain an understanding of the potential impacts should lower quality water become more persistent or "the norm."

¹⁴ United States Environmental Protection Agency

¹⁵ Park closures did occur during flood events which raised pollutants to unsafe levels which impacted park visitation; however, closures are not a good indicator of what would happen should pollutants reach levels somewhere between current levels and flood condition levels, levels that would not prompt closures but might impact visitors' desire to go to Lake Travis.

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First, RCLCO evaluated the impact that lower water quality would have on tourism and businesses that depend upon the tourism sector of the economy. Poor water quality may reduce Lake Travis' appeal as a recreation destination, particularly for contact recreation such as swimming, water skiing, or windsurfing. In 2005, the Texas Water Conservation Association conducted a study of the correlation between user perceptions of recreation impairment and chlorophyll-*a* concentrations, an indicator of planktonic algae and the nutrient-related condition most frequently affecting the desirability of reservoirs for recreational uses. The study revealed that increased concentrations of chlorophyll, which equate to higher nutrients and lower water clarity, is correlated with more users reporting impairment to recreational use.¹⁶ A change in user perception of water quality could impact the desirability of restaurants and facilities that benefit from high-quality water views as well as recreational activities such as scuba and boating.

In a 2009 study on recreational boating at Lake Travis, produced by the LCRA in association with the Department of Recreation, Park, and Tourism Sciences at Texas A&M University, the importance of water quality and other physical elements of Lake Travis among boaters was explored through surveys and interviews (conducted in 2008) of lakeshore property owners, marina slip tenants, and public boat ramp users. With respect to boater perceptions of lake conditions, water quality remains a physical feature of the lake that boaters like best, a similar result of previous surveys conducted in 1995 and 2000. When asked whether they were "bothered by poor water quality," boaters responded with an average score of 2.2 out of five¹⁷, suggesting that perceived poor water quality, for most boaters, did not influence their enjoyment of the lake. However, five percent, 7.6 percent and 11.1 percent of boat ramp users, marina slip tenants, and lakeshore property owners, respectively, indicated that they either agreed or strongly agreed that they were bothered by poor water quality at Lake Travis. The question is whether these lake users were dissatisfied enough with the level of water quality to alter their behavior and direct their spending towards other activities should water quality problems stay the same or worsen. The study did ask survey respondents to indicate how boaters would cope with adverse elements on the lake, but did not directly tie in a response to poor water quality to any coping strategy including activity substitution (enjoying another activity other than boating), resource substitution (changing the lake on which they choose to boat), boating cessation (stop boating altogether), or some other activity. Given the above, it is difficult to determine how boater visitation at Lake Travis might decrease should further water quality degradation occur in the lake. However, if the number of boaters decreased by 10 percent (from 2010 visitation numbers), there would be an economic impact of \$349,000, which correlates to a loss of seven jobs as a result of decreased spending on gasoline, concessions at marinas, grocery purchases, and other miscellaneous expenses. If this drop in boater visitation were applied to other visitors to Lake Travis including park visitors, vacation home renters, resort hotel guests, and other visitors, spending would be impacted by \$10.5 million, resulting in an overall negative economic impact of \$7.1 million and a loss in 122 jobs.

¹⁶ Texas Water Conservation Association, "Development of Use-Based Chlorophyll Criteria for Recreational Users of Reservoirs," June 2005

¹⁷ Response Categories: 1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree

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Secondly, to inform the potential impacts of diminished water quality on local industry, RCLCO conducted interviews with representatives of numerous companies in the region that are large users of water including beverage makers, semiconductor manufacturers, medical device manufacturers, chemical companies, and others. Each of the companies used water in different ways and for varying purposes, but they each had the same general conclusion regarding the impacts of degrading water quality. Basically, if water quality degraded to the point where additional treatment was required, local utilities supplying municipal water would incur the increased costs of treatment, costs which would be passed on to consumers as well as commercial users. If the quality of water supplied by local utilities becomes lower than its current level, additional purification costs would be incurred by industries that require a level of water quality that is even higher than what is currently provided by local utilities. For example, if the allowable surface water bacteria levels are elevated, future water products may not be as clean as current municipality products, but may meet basic quality standards. These additional purification costs, however, were not viewed as an expense which would make the cost of producing goods infeasible and thus require the business to shut down its operations, nor would the increased costs give companies pause on whether to invest further into their presence in the Austin market (some actually reported that they were recycling and purifying their own waste water for use in the manufacturing process, as it was cheaper than purchasing new water from the local utility). The reasons for investing in Austin and Travis County were numerous and broad, and, while water quality and cost were important factors, they were not the primary deciding factors on whether to invest in the region (electricity and chemical costs were cited as more expensive components to doing business). In fact, water *availability* was of higher concern to many industries, with many concerned that lake levels and the storage capacity of Lake Travis might impact the ability of local utilities to deliver the amount of water needed for manufacturing processes (as stated previously in this report, it was beyond the scope of this engagement to understand the impacts of water shortages on the local economy, but clearly the effects would be devastating to the existing industries dependent upon the use of water in their manufacturing processes, the future economic growth potential of the Austin region, and the general well-being of the existing population).

Although all companies acknowledged that degrading water quality was indeed undesirable, and they also agreed that reduced water quality would increase their overall costs, RCLCO could not with certainty determine that these increased costs would have any negative economic impact on the region in the form of job losses, decreased investment by existing employers, or other economic disadvantages. It is possible that the increased costs could result in some job losses at some companies, but more than likely it would make their cost of business higher and perhaps lower their level of competitiveness. It is also possible that higher water processing costs could diminish the Austin region's competitiveness in attracting the types of industry discussed above, but it was beyond the scope of this engagement to determine the extent to which water processing costs play into a company's decision to invest in a region or relocate from one region to another. This would require extensive knowledge about the cost structure of innumerable companies and the relative importance of water quality in their decision-making processes.

Another unknown with respect to the potential impacts of deteriorating water quality on the local economy is the potential reduction in Lake Travis' consumption value which, as stated earlier, is the direct value that lake users receive from utilizing Lake Travis and its many related facilities. However, there are thousands of residents in the Austin region that rarely (or never) visit an amenity like Lake Travis, but receive non-use consumption value as

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reflected in their having the *option* of being a future user, or through the indirect quality of life benefits they receive from the existence of such a valuable natural resource in the community. Degradation of Lake Travis' water quality could reduce its consumption value and impact Austin's quality of life, potentially impacting the region's economic growth potential and level of desirability. This type of consumption value requires data not available for this study as well as complex technical analysis that was outside the scope of work.

Finally, RCLCO evaluated the potential impact that poor water quality could have on real estate values. There are no data to support that real estate values have suffered at Lake Travis as a result of any perceived water quality or water clarity degradation that has occurred to date. Given the lack of any demonstrated impacts, RCLCO evaluated several case studies to determine the potential impacts that poor water quality could have on real estate values, which in turn would have a negative fiscal impact on the local municipalities within the study area. A reduction in a lake's aesthetics due to lower water quality has been correlated with reduced home values of properties around lakes in several studies conducted in Maine and Minnesota. A 1996 study in Maine found that purchasers of lakeshore properties were familiar with current water clarity, and that water clarity history influenced their purchase decisions.¹⁸ An update of this study incorporated sales data, and the results of the analysis revealed that water clarity significantly affects property prices around Maine lakes and there is considerable economic demand for water clarity by lakeshore property owners.¹⁹ Results suggested that with a one-meter reduction in water clarity, the value per front foot of lakefront property would drop between one percent and 40 percent (weighted average of nine percent).

The same methodology was applied in a 2003 study in Minnesota and yielded similar results. The Minnesota analysis was conducted to determine if water quality of Minnesota lakes located in the Mississippi Headwaters Board jurisdiction affects lakeshore property prices. Their hypothesis prior to conducting the study was that "water quality, like most environmental amenities, is a non-market good that is not bought and sold outright as its own product on the marketplace. Instead, water quality is exchanged in the market, albeit implicitly, as an inherently attached characteristic or feature of some differentiated product." Residential lakefront properties are a kind of differentiated product because each property has its own distinct structural, locational and environmental quality variables that make it unique.

Given the above, it was assumed that the value of water quality is capitalized in the value of the land and its share of a property's price "can be determined through the price differentials between properties on lakes with differing levels of water quality, while controlling for other property characteristics."⁸ The

¹⁸ "Water Quality Affects Property Prices: A Case Study of Selected Maine Lakes," 1996

¹⁹ "Lakefront Property Owners' Economic Demand for Water Clarity in Maine Lakes," 1998

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Minnesota study, like the Maine study, used hedonic regression analysis²⁰ to determine the implicit price of water quality for lakefront land. They utilized available water quality data from the Minnesota Pollution Control Agency and data on 1,205 lakeshore property sales from 1996-2001.

The major finding of the Minnesota analysis was that lake water clarity (turbidity) proved a significant component of lakeshore property prices in all lake groups studied (a total of 37 lakes were included in the study), given that water clarity is one of the few quality measures that is perceivable to property owners and thus capitalized in property prices.²¹ The implicit prices of water quality were determined and calculations were made to illustrate the changes in property prices on the study lakes if a one-meter change in water clarity²² would occur. After eliminating outliers for four of the 37 lakes (Leech, Cass, Big Sandy, and Bemidji lakes, which have unique circumstances compared to the other lakes in the study), the average drop per front foot of lakefront value was approximately six percent for each one-meter change in water clarity (the changes in value ranged from less than one percent to over 20 percent for each one-meter change in value).

It is beyond the scope of this engagement to determine how a decrease in water quality or clarity, from current levels, will impact real estate values in the future, but the Maine and Minnesota case studies are instructive in hypothesizing potential implications on property values. A study of all of the relevant variables unique to Lake Travis would need to be incorporated into a hedonic regression analysis to more specifically pinpoint possible property value losses with respect to water quality levels and the potential fiscal impacts in the study area. However, if we assumed that the conditions at the lakes in Maine and Minnesota were similar to those at Lake Travis, and if lakefront *land values* dropped between 5-10 percent with a one-meter drop in Lake Travis water clarity, it would result in property value losses of \$27 million to \$53 million in the study area.

In addition to property value losses, many residents along Lake Travis that draw water directly from the lake would likely need to introduce filtering technologies to deal with increased pollutants and contaminants in the lake. At the time of this study, information regarding the number of individual

²⁰ Hedonic regression analysis is a method used to determine the value of a good or service by breaking it down into its component parts. The value of each component is then determined separately through regression analysis. In this case, the value of waterfront property is determined by separating the different aspects of the property – location, size, lake, water clarity, etc. – and using regression analysis to determine the value of each variable. The word hedonic refers to pleasure, and hedonic regression analysis determines the perceived value that each part of the property (in this case, water clarity) has on the overall value. One of the more widely-recognized examples of hedonic regression is the Consumer Price Index, which examines changes to the value of a basket of goods over time.

²¹ “Lakeshore Property Values and Water Quality: Evidence from Property Sales in the Mississippi Headwaters Region,” 2003

²² Meaning the naked eye can see to a water depth of one meter (or 3.28 feet) less than they once could

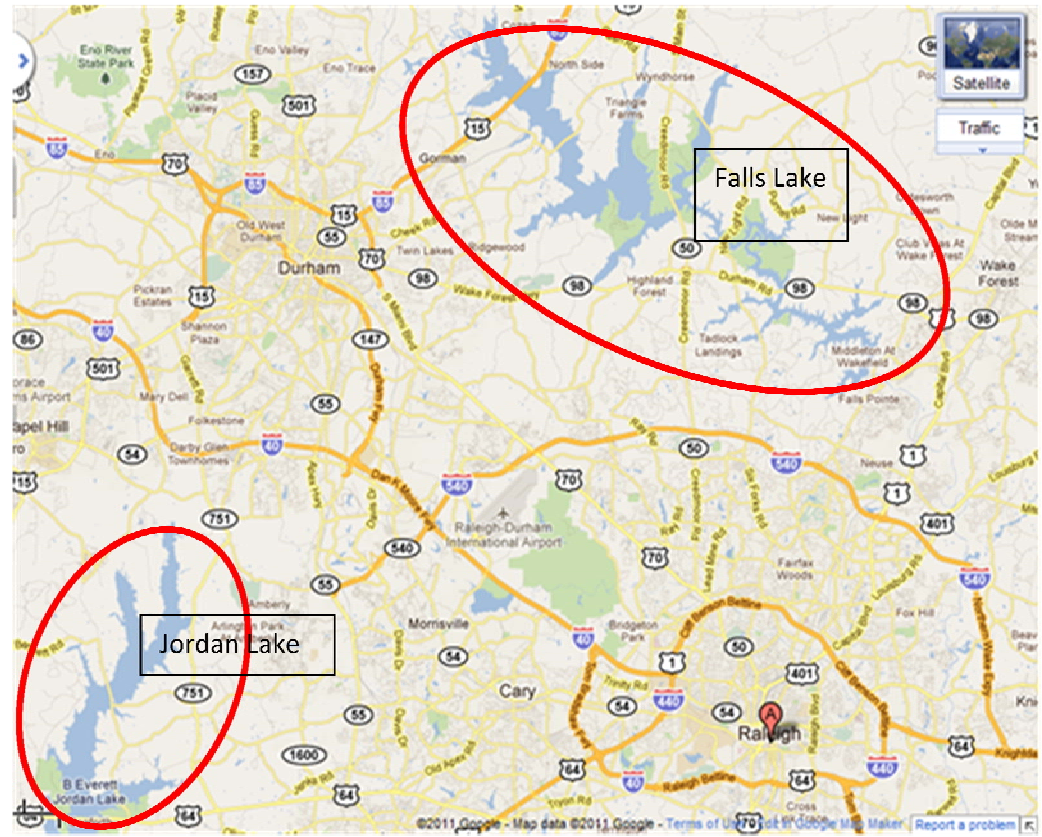
intakes was not clear. In any event, the cost associated with installing filtering technology for each individual intake is a cost burden absorbed by each individual property owner. Although the cost could be significant to the property owner, it is not an economic impact as the cost to install such technology is likely done locally and the dollars spent by homeowners go to local businesses that benefit from such a project.

Cost of Lake Restoration

Should the water quality of Lake Travis deteriorate to levels where the quality of the water supply is in doubt, irrespective of the clarity, the cost of restoring the lake can be great. It was outside of the scope of this engagement to develop any “what if” scenarios with respect to increased lake pollution and the costs to restore the lake to current levels, but one can look to examples around the country to understand the significant costs, both monetary and social/community, associated with lake and reservoir restoration.

One such example is Falls Lake in the Raleigh-Durham area of North Carolina. This 12,500-acre reservoir was created in 1983 by the Army Corps of Engineers by damming the Neuse River in response to flooding that had damaged land downstream. The lake and its surrounding 25,000 acres of public land have become a recreational destination for fishers, kayakers, boaters, campers, and families of the region. In addition, the lake serves as a drinking water source for nearly a half-million people in Wake County and the high growth areas of the Research Triangle, a region comprised of the North Carolina cities of Chapel Hill, Raleigh, Cary, and Durham.

Like Lake Travis, Falls Lake is in close proximity to suburban development in one of the most rapidly growing metropolitan areas in the United States. Development over the past thirty years has resulted in increasing amounts of sediment-laden stormwater rushing off the pavement into streams, creeks, and rivers that flow into the lake. In 2008, the North Carolina Division of Water Quality designated the lake “impaired” after scientists found high levels of phosphorus and nitrates which



forced action on the problem. In 2011, new rules were drafted to ensure local government compliance with state and federal water quality standards with respect to stormwater runoff and how new construction will happen in the Falls Lake watershed. The rules are intended to lower the nutrient levels, primarily nitrogen and phosphorus, within the next thirty (30) years to bring the lake into compliance with the EPA's Clean Water Act.

The high nutrient levels are driven by rainwater runoff over highly developed areas with a lot of pavement or concrete and little exposed ground to absorb the runoff. The rainwater picks up nutrients and sediment from rainwater, lawn and agricultural runoff, animal waste, septic systems, and sewage treatment plants, and deposits them into Falls Lake. Some of the nutrients are beneficial, but too many nutrients form oxygen-depleting algae blooms that kill fish and other organism and reduce the clarity of the water. In addition to nutrients, runoff carries fecal coliform bacteria to the lake as well, further jeopardizing the lake's safety and presenting public health hazards periodically.

As of 2011, the costs for cleaning up the lake, including upgrading sewage plants and bringing existing development into compliance, are estimated to be \$1.5 billion, and local governments are expected to pay the majority of the cost. The clean-up is based on a 25-year plan. Should the plan not achieve results in the near-term, the City of Raleigh may need to spend over \$115 million to upgrade an existing water treatment plant and \$200 million in other improvements.

Jordan Lake, located to the southwest of Falls Lake, is another large reservoir already in the process of being cleaned up at a cost in the hundreds of millions of dollars, also paid for by the taxpayers of Durham County.

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GENERAL LIMITING CONDITIONS

Reasonable efforts have been made to ensure that the data contained in this study reflect accurate and timely information and are believed to be reliable. This study is based on estimates, assumptions, and other information developed by RCLCO from its independent research effort, general knowledge of the industry, and consultations with the client and its representatives. No responsibility is assumed for inaccuracies in reporting by the client, its agent, and representatives or in any other data source used in preparing or presenting this study. This report is based on information that to our knowledge was current as of the date of this report, and RCLCO has not undertaken any update of its research effort since such date.

Possession of this study does not carry with it the right of publication thereof or to use the name of "Robert Charles Lesser & Co." or "RCLCO" in any manner without first obtaining the prior written consent of RCLCO. No abstracting, excerpting, or summarization of this study may be made without first obtaining the prior written consent of RCLCO. This report is not to be used in conjunction with any public or private offering of securities or other similar purpose where it may be relied upon to any degree by any person other than the client without first obtaining the prior written consent of RCLCO. This study may not be used for any purpose other than that for which it is prepared or for which prior written consent has first been obtained from RCLCO.