

**Growth Neutral Water Use Indicators:
A Study on Per Capita Water Use in the City of Seattle**

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A Degree Project submitted in partial fulfillment
Of the Masters of Public Administration
To the Daniel J. Evans School of Public Affairs

June 2001

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Executive Summary

With a growing population, clean water is becoming a scarce resource. Assessing the amount of water used in the City of Seattle is crucial to conservation measures and tracking progress. Working with Seattle Public Utilities (SPU), the objective of this project is to assess the per capita water use according to location, season and category sector. By looking at per employee/per capita for specific commercial and certain residential sector's water use, it will be easier to account for population growth. The aim of the research is to create a database that will track the past water use by per capita for future use by SPU.

Through the combination of three main databases, the project works to create a comprehensive framework to combining the data into a cohesive database. SPU maintains accurate water consumption data from its own database called WaterBIRD. The US Census Bureau via Puget Sound Regional Council (PSRC) provided the population data. From PSRC, who does the most comprehensive data reporting from business in Washington State. The employment data was taken from PSRC's smaller sections of Transportation Analysis Zones (TAZ) and larger groups were formed. By combining the data from the WaterBIRD, US Census Bureau and TAZ, the project has created a basis for water use per capita/per employee. From the population and employment data, seven sectors were identified from PSRC's category codes that are comprised of two residential categories and five commercial categories.

The principal findings indicate location and category are highly related to water use. Depending on characteristics of the City of Seattle neighborhoods and the sector, aggregations of water consumed showed a pattern in use. Seasonally, there are obvious constraints summer brings over winter. Overall, water use is gradually decreasing per capita but continual conservation and education measure are needed to insure enough water in the future, especially during droughts and extremely population growth.

Although this project is preliminary in its findings, it does establish a per capita water use within the City of Seattle. Water use measured in per capita will create a quick reference to water use for legislators, SPU and the public. Continuing to monitor the amount of water used per capita, especially during sensitive times will enable SPU to be proactive about water use rather than reactive to water shortages. More research on the specific locations and smaller category sectors will enable SPU to target certain high use areas or customers, but the project forms the basis of further research.

With this database there is consistency each year and added data will improve the research's validity. In the future, SPU should set benchmarks for use within each sector. Smaller units of analysis with more accurate employment data would increase validity. Disseminating the information through on-line resources and newsletters to indicate how SPU customers are doing per capita in relation to previous years and location greatly add to the community relations.

Water is a finite resource. To be good stewards of this resource, it is necessary to use less water. In order to preserve the available clean water, the City of Seattle wants to instill good stewardship and conservation. It is clear protecting the environment, enough water for wildlife and people are a strong component in motivating customers to save water.¹ Seattle Public Utilities (SPU) oversees all water use within Seattle, including some outlying areas near the city limits. Seattle is the fastest growing urban city in Washington; therefore water needs are increasing at extremely high rates. With such high increases in population, clean water is becoming more difficult to obtain. The growing demand is within both residential and commercial sectors of the city. Therefore, it has become increasingly necessary to track the amount of water use.

SPU has received a challenge from the City of Seattle Council to reduce water use by 1% every year for the next 10 years. The project was commissioned in 2000 and will track water use and water resource indicators until 2010. Although this research does not aim to calculate and recommend how the 1% decrease in overall consumption will be attained, it will create a new database to measure water use. The Council believes the increasing need for urban water will not continue to receive priority in increased watershed quotas, which are regulated by law to provide water for native fish species, recreational and downstream users. Because of the aforementioned concern, this project will propose simple growth neutral water-use indicators to measure the average consumption of SPU customers.

In order to accurately account for the rising population in the city limits, growth neutral indicators that can account for increases in population will track water use. By using per capita data, the research can account for the population growth. Demographically, raw data is comprised of water use over time by sector, redefined census tract and seasonal use. It helps to determine the effectiveness of future water conservation efforts by SPU by using past data as a baseline for future use. The database will track water use in seven sectors of SPU customers.

This is a new endeavor for SPU, in that, it has not developed a database comprised of demographic data, water use data and employment data. Additionally, SPU has not tracked water use by using growth neutral indicators with specificity to certain sectors of residential and commercial customers. The research is a compilation of data from the following sources: US Census, Puget Sound Regional Council and SPU water meter measurements. All of these data sources combine to create the new database on water resource indicators.

¹ Dethman, Linda. "1999 Water Conservation Survey." Seattle Public Utilities

The research makes assumptions about the behavior and trends of residential and commercial water use and climate data. The database is being created to track future use from 2000-2010; therefore it is important to set out water resource indicators that will be used continually each year. Also, since the database is a combination of other databases, new indicators are limited to the available data within SPU. It is assumed that the amount of precipitation affects the available water annually. Droughts greatly affect water use and precipitate increases in water price; therefore it is assumed that droughts indicate behavior changes. Within the residential and commercial sectors, residential water use fluctuates according to seasonal use whereas commercial water use tends to remain constant throughout the year. The novelty of this research is its approach to neutralizing population growth yet still accurately measuring water consumption. Overall, this study is limited to the City of Seattle and customers served by SPU; yet many of the equations and indicators can be used in other municipalities.

Seattle Public Utilities supplies water to 1.3 million people and numerous firms in the region. Nearly all this water originates from the 90,000 acre Cedar River Watershed and the 13,300-acre South Fork Tolt River in eastern King County². Figure 1 shows the size of the Cedar River Watershed over the South Fork Told River. It also depicts the distance clean water travels to reach the city. SPU's operations must be protective of the environment, particularly the fish and wildlife resources of the Cedar and Tolt River watersheds, while it provides a reliable source of high quality drinking water to the City of Seattle. It is becoming increasingly difficult to obtain additional water; therefore it is necessary to conserve in order to meet future demand.

Historically, water was provided by wells, private water companies and springs. In 1888, prompted by a tenfold population increase during the decade, Seattle's mayor and city council called for an election to decide if the city should and operate its own water system. Shortly before the election, the "Great Seattle Fire" of June 6, 1889, destroyed the entire 64-acre business district. A major contribution to the widespread destruction was the lack of water available from the patchwork of private water suppliers. The vote for a municipal water system was approved by a resounding 1875 to 51 margin³.

In 1895, Seattle residents voted to approve revenue bonds to construct the Cedar River System. On January 10, 1901, water first flowed from the Cedar River into Seattle. A diversion dam at Landsberg channeled water into the Lincoln and Volunteer reservoirs in Seattle. Today, most of Seattle's water is still supplied by the original Cedar River infrastructure. Currently, the Cedar River Watershed supplies 66% of the drinking water for the City of Seattle and surrounding areas. On average, the Cedar River Watershed receives 57 inches of rain and snowmelt annually at lower elevations and 140 inches at higher elevations⁴.

The Cedar River remained the main water source until 1964, when the South Fork Tolt Watershed was created. Nestled in the foothills of the Cascades east of Carnation, WA, it supplies about 30% of Seattle's drinking water. In 1997, the City of Seattle successfully exchanged lands within the South Fork Tolt watershed with Weyerhaeuser, enabling Seattle 70% ownership of the land and water. Currently, the South Fork Tolt Watershed can provide up to 100 million gallons of drinking water per day (equivalent to 10,000 CCF/day). Throughout the year, it received between 90 and 160 inches of precipitation per year⁵.

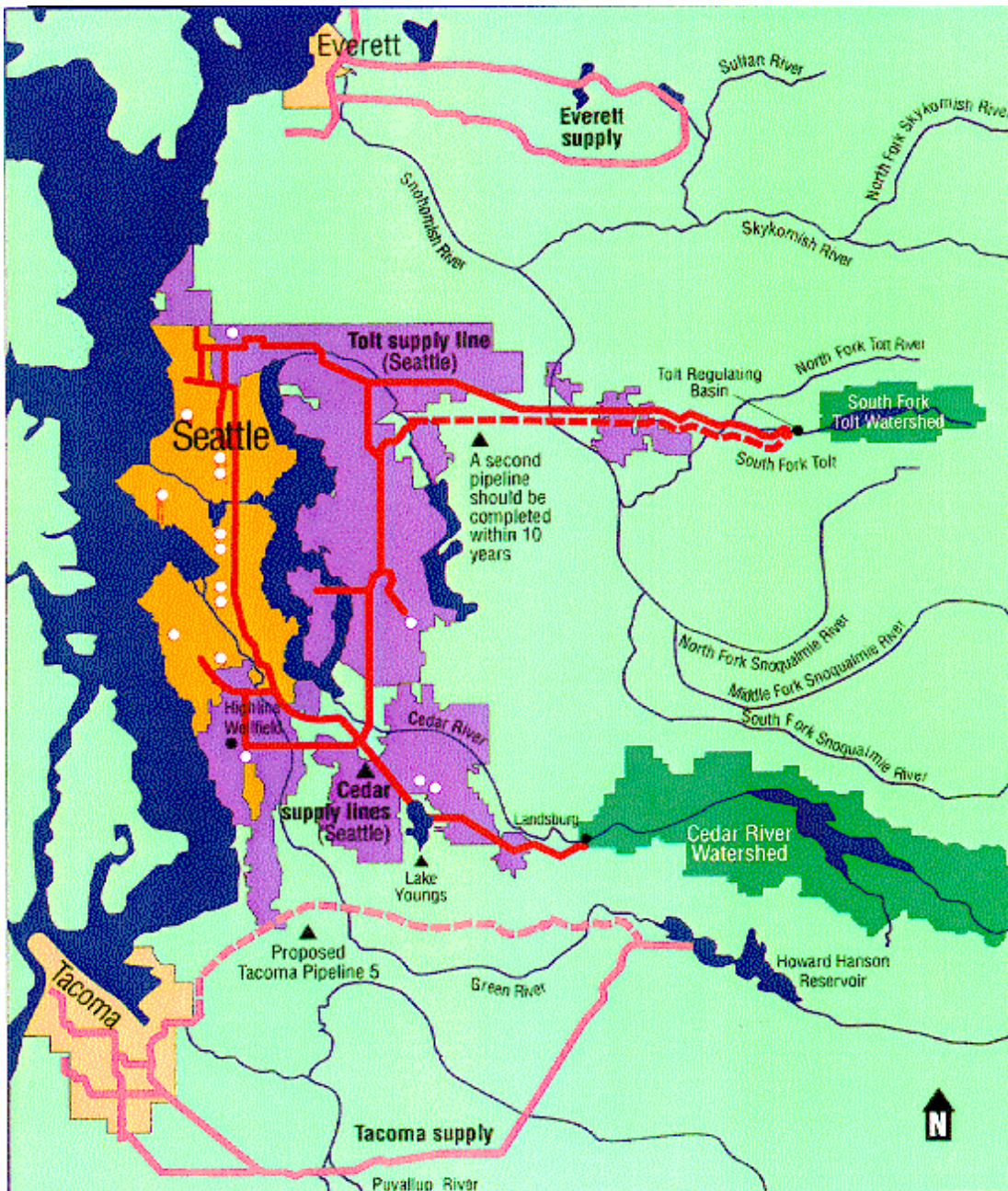
² Current Water Supply Conditions and Outlook. <http://www.ci.seattle.wa.us/util/watersupply/current.htm>

³ Water System History. <http://www.ci.seattle.wa.us/util/services/Drinkingwater/systemhistory.htm>

⁴ Cedar River System. <http://www.ci.seattle.wa.us/util/watershed/cedar/default.htm>

⁵ South Fork Tolt River. <http://www.ci.seattle.wa.us/util/watershed/tolt/default.htm>

Figure 1: Watershed Map



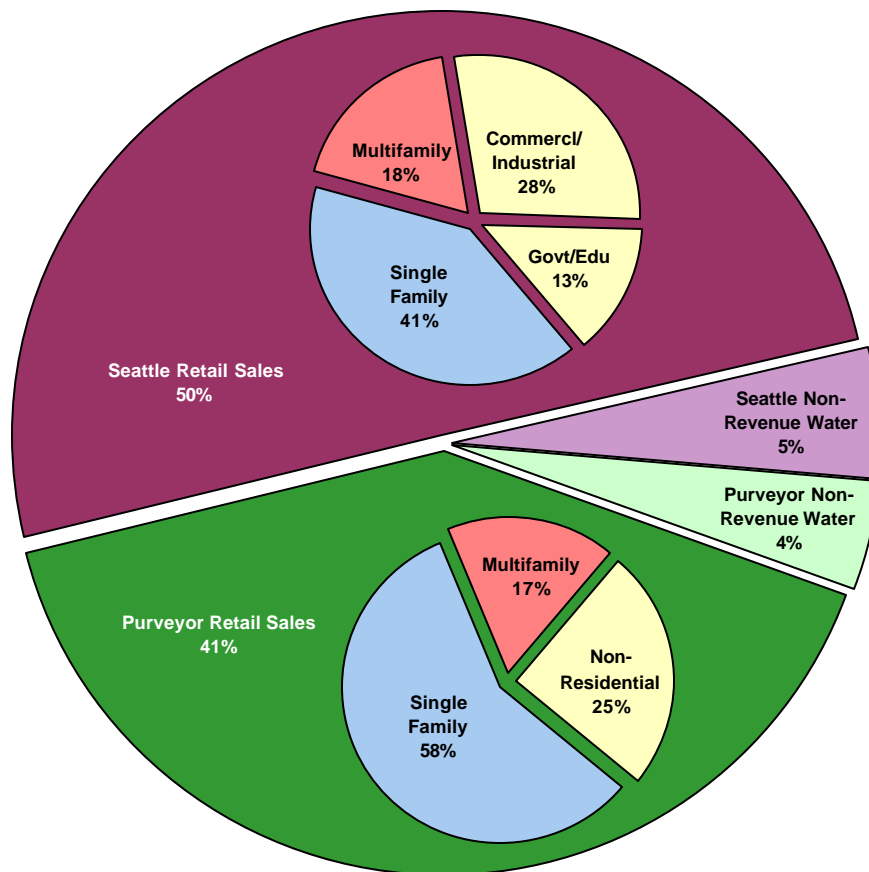
Source: Bruce Flory, Financial Department; Seattle Public Utilities

The remaining 4% water source for the City of Seattle is comprised of newly acquired ground water sources. In 1987, the first ground water source was two wells in the Highline Well Field began operations. A third well was added in 1990. But the bulk

of the drinking water for Seattle comes from the Cedar River watershed and the South Fork Tolt River watershed.

Currently, SPU serves 595,000 people by direct retail water services and serves 686,000 people through wholesale water. Residential users, which included single family and multi family dwellings, consume roughly 59% of retail clean water⁶. Most of SPU's customers are residential. Purveyors are water districts and municipalities that purchase clean water from SPU but do not use any administrative resources. Figure 2 shows the amount of consumption by purveyors and the City of Seattle. It further breaks down the amount of water used within those two sectors. For example, the purveyors of the Shoreline city buys water from SPU but administers its own billing system and services. Non-Revenue water sources are public facilities (eg: public bathrooms) and SPU that do not pay for water services because they are a special government entity.

Figure 2: Total Consumption by Sector including Purveyor



Source: Seattle Public Utilities Consumption Graph.
<http://www.ci.seattle.wa.us/util/services/Drinkingwater/docs/Usage2001.PDF>

⁶ Demographics and Water Use Statistics.
http://www.ci.seattle.wa.us/util/services/Drinkingwater/average_use.htm

SPU measures water use in Cubic Feet (CCFs). One hundred CCF is equal to 748 gallons of water. This standard is used for almost all municipalities. The average water use per month for a single family home is 7 CCFs, for a small convenience store it is 20 CCFs, a 15 unit apartment is roughly 60 CCFs and for a large commercial (such as City Hall) it is 800 CCFs⁷.

SPU's billing system varies according to the business or residential type. Typically, the commercial entities pay less per CCF than a single-family home, but they also consume a much higher proportion of water. Residential consumption peaks at higher levels than commercial consumption. Peak week and peak day demand for the residential class are two to three times as high as average annual demand. Seasonally, water use is much higher in the summer months than the winter months⁸. For residential water consumers, more water is consumed in the summer for drinking, watering lawns and gardens and washing clothes and automobiles. The warmer weather invites people to spend more time outside and maintain household beauty.

On the other hand, businesses tend to use a stable amount of water throughout the year. For the most part, commercial sectors do not fluctuate seasonally, but often times are specific to the manufacturing needs and characteristically intensive water use. Also, the intensified need from residential sectors puts a constraint on the available water for the commercial sector.

For residential units, there is a distinction between indoor water use and outdoor water use. Indoor water use consists of taking baths, showers, flushing toilets and washing clothes and dishes. Among the indoor uses, toilets use the greatest amount of water, while showers and baths (combined) and clothes washing use a nearly equal amount of water.⁹ Since multi-family homes often do not have clothes washers, it would likely be less significant. As of 1993, the City of Seattle requires toilets to be low flushing when reinstalling toilets. Outdoor water use in residential sectors includes lawn and gardening care. Both of these aspects compose the greatest water use outdoors. Typically, outdoor use is noticeable for single-family households. Rarely are multi-family homes using water for outdoor use at rates of single-family.

Because, there are many more single-family households a larger infrastructure to deliver services to each individual home is necessary. Local distribution facilities (pumps, reservoirs, distribution treatment) must be sized to meet peak day water demand. Transmission pipelines and pumping stations must be sized to meet peak week demand. Since the residential class contributes more to peak day and peak week demand than the commercial class, a higher percentage of the costs related to meeting such peaks are allocated to the residential class¹⁰.

⁷ Rate Increase Impacts. http://www.ci.seattle.wa.us/util/services/rates/summary_rate_table2001.htm

⁸ Drinking Water Frequently Asked Questions.
<http://www.ci.seattle.wa.us/util/services/rates/2001FAQsWater.htm>

⁹ Dethman, Linda. "1999 Water Conservation Survey." Seattle Public Utilities

¹⁰ Drinking Water Frequently Asked Questions.
<http://www.ci.seattle.wa.us/util/services/rates/2001FAQsWater.htm>

Demand is much higher during the summer months when there is the least amount of water available. To encourage conserving water during the summer months, SPU institutes a higher price per CCF. Peak usage is from May 16 through September 15 and off-peak usage is from September 16 until May 15.¹¹ The higher rate is not meant to be a penalty rate, but rather a price incentive to save water. The incentive is even greater for residential units to use less than 5 CCFs/month (Figure 3). Figure 3 shows the increases in water rates in the coming year and the current water prices. Residential units pay higher rates than commercial. Commercial sectors typically use much higher levels of water throughout the year.

Figure 3: Rate Increases planned for the following two years

Year	Off Peak Usage	Peak Usage*	Peak Usage**	Off Peak Usage	Peak Usage
	Residential Inside Seattle			Commercial Inside Seattle	
2000	2.16	1.60	2.53	1.11	2.01
2001	2.16	2.16	2.85	1.24	1.41
2002	2.33	2.33	3.07	1.29	2.34
	Residential Outside Seattle			Commercial Outside Seattle	
2000	2.46	1.82	2.88	1.27	2.29
2001	2.46	2.46	3.25	1.41	2.57
2002	2.66	2.66	3.50	1.47	2.67

* Peak water use under 5 CCFs/month

**Peak water use above 5 CCFs/month

Source: Seattle Public Utilities Rate Summaries
<http://www.ci.seattle.wa.us/util/services/rates/default.htm>

During the winter months, the price increases because there are adequate water resources. The City Council, voters and SPU oversee the administration and implementation of higher water bills. Rates usually increase to account for inflation or when there is shortage of water. Typically, water bills rise every two to four years to account for inflation and additional service infrastructure. As seen in Figure 3, rates are set to increase in 2002. Usually SPU prefers to give minimum one-year advanced notice for scheduled rate increases.

Occasionally, prices are raised to account for low precipitation (a drought) or a poor revenue year. In 2000-2001 Seattle experienced a drought. Although SPU and the City Council promised no new price increases until 2002, it is necessary to raise prices to curve demand, especially during the summer, and to raise enough funds to continue quality service during the coming winter. It is difficult to manage water during a drought without curving demand. It is financially difficult to recover from the added

¹¹ Ibid.

administration and management of water shortages; therefore SPU and the City Council often have no choice but to raise prices 10-12%.¹²

The City Council established the Water Fund to serve as the annual budget. In the year 2001, with the drought and added costs of delivering services, the mayor approved bonds to meet the financial needs of SPU. It is the hope of the mayor and the City Council that the Water Fund will be able to sustain the water demands of Summer 2001.

¹² Ibid.

The goal of this project is to create a simple database, where future water consumption data will be easily added to track the per capita use. In simplifying the system to measure water use, using per capita and per employee parameters for the residential and commercial sectors, respectively, have been chosen as indicators that account for population growth. By using per capita data, it is an easy indicator of water use without accounting for population growth, especially if compared over time and category sector.

The project results will serve as a baseline for the proceeding years, from the inception of the City Council's challenge to conserve water. Since it tracks all customers, SPU will have the ability to specify where certain areas, sectors or seasons need to be addressed to continue to conserve water per capita. The indicators are a quick reference for policy makers, legislators and the public, which will ultimately be used to show an overall progress in the city. This will be helpful for city council members, SPU customers, other municipalities and EPA as a simple measure of success.

Data for this analysis is collected to represent demographic background such as, water consumption, location, employees and population. The three main databases for this research are WaterBIRD, US Census Bureau and Transportation Analysis Zone (TAZ) from Puget Sound Regional Council (PCRC). The databases were combined according to location and category sector. Comparisons will also be made among averages by season and year. Using the average as the middle consumption model, high and low consumers will be assessed against that mean. The US Census tracts were obtained through the Puget Sound Region Council and the use of ArchVIEW the Geographic Information System (GIS) to map the location of each Grouped Tract.

WaterBIRD

SPU's database is called WaterBIRD. It contains all water consumption from 1991 until 2000. Before 1991, data was collected through a different database. Those files are too difficult to convert to WaterBIRD. Data starting from 1994 is considered most accurate because in 1992 and 1993 Washington experienced a drought. 1991 data was the first year of the program and is believed to have flaws. The two drought years are important to track the amount of use during shortages. For purpose of this research, 1991 is thrown out because of the validity of its numbers.

WaterBIRD Data is composed of:

- *Prorated Consumption*: Average daily use is listed for each season.
- *Service Days*: Total number of days service was provided to an account for the given season.
- *Category Codes*: 37 category codes of up to 5 characters, which describe the type of account (ex: apartment, house, armed services, etc).
- *Sector*: 7 sectors for the purpose of this research to simplify the categories.

Customers are billed quarterly for each season. Water use is calculated daily because often customers start water accounts mid-quarter.

Dates for Quarterly Statements:

Spring:	March 16 – May 15
Summer:	May 16 – September 15
Fall:	September 16 – November 15
Winter:	January 1 – March 15 & November 16 – December 31

WaterBIRD's seasons are measured in three categories: Summer, winter and spring/fall. Spring and fall are combined because water uses during these months are similar, therefore calculations are simplified. Since most SPU customers are residential, it is crucial to have summer and winter separate because of the vast differences in water use.

Puget Sound Regional Council Data Transportation Analysis Zoning (TAZ)

PSRC's data contains census tract data by household and employment. Through the Washington State Employment Securities Division (ESD) administration of ES-202 files which serve as business survey files. The survey is conducted during one week of March of that year. It included part-time and full-time employees. This data is then reported to the Standard Industrial Classification (SIC).

The data is only available for specific years due to poor record keeping and a new system database installed in 1995. In 1995, geo-coding was first used to computerize the location via Geographic Information System (GIS) databases and SIC. Latter years have benefited from multiple rounds of annual jurisdiction review and improvements to the geo-coding process.

The new process geo-coding process makes it much easier to track businesses. But most data before 1995 is considered difficult to use for continuity sake. The sporadic data availability creates gaps in the analysis before 1995. Also, in 1996 the database failed to accurately evaluate the businesses and therefore it is not considered valid. In general, PSRC has difficulty in accurately tracking employment and firms in the City of Seattle area well because many firms fail to complete their annual reports or leave much of it blank. PSRC does not have the resources to track incomplete files and often enters data "as is."

From the data collected from geo-coding and surveys asking businesses to report the number of employees, it only includes estimates. There are categories of jobs where employers are not required to submit ES-202 information; therefore they are not included in total employment. Also there is overlap of large corporations. For example, a large law firm which also employs accountants, clerical help, librarians, parking and security attendants and building maintenance workers will normally have all employees report under SIC 82 called legal services.

Available Data through PSRC:

- *Population and Household Estimates by Census Tract*: 1990 census tract number, count of housing units, vacancy rate, average household size, household population and total population. For the purpose of this research 1990 data was used for the census tracts, but 2000 data was available.

- *1999 Population and Employment TAZ*: Data available from 1995, 1997, 1998, 1999. Single-family household, Multi-family household, total employment, manufacturing, and number of jobs within each SIC code.

To calculate the demographic background by employment sector, number of employees and SIC code is the most helpful PSRC data, but it also is extremely incomplete. Data analysis will be run on the years available and additional data from TAZ will be appended to the project. Within the commercial sectors, agriculture, forestry, fishing and mining were excluded from the data to account for extremely high water use areas.

Puget Sound Regional Council (US Census Tracts)

According to the US Census Bureau the City of Seattle contains 121 census tracts. Each tract is formed to represent a fairly equal number of people living in certain areas. The density may vary from census tract to census tract, but the numbers of individuals are kept fairly constant. Often census tracts are broken into smaller tracts when areas become more populated. So in between the ten-year census surveys, populations grow and more census tracts are formed. PSRC uses TAZ tracts to calculate their employment and residential dwellings. The use of TAZ is PSRC's smaller unit of analysis. TAZ breaks the US Census tracts even smaller to calculate more area specific employment and residential data.

Category Sections

Each business or residential unit is categorized by SIC code by PSRC. The SIC code is a state wide recognized format for designating business firms and residences by their production or type, respectively. PSRC has 34 identified categories (Appendix A). From the category codes, this research has adopted the seven sectors to evaluate each category. Housing has been broken into two categories, single-family homes and multi family homes. All commercial space is broken into five categories; Manufacturing, Wholesale, Retail, Service and Government/Education. SIC codes are assigned numbers according to industry, commercial space or production. Washington State assigns codes for tracking purposes and to have breakdown of certain industry indicators.

From these codes and housing categories these seven categories are used:

- *Single Family*: Residential dwellings designated for one family unit. This category comprises the majority (1.2 million) of SPU customers.
- *Multi Family*: Residential dwellings designated for multiple number of units (ex: apartment, share house, condominium). This category comprises the second largest number of SPU customers.
- *Manufacturing*: Includes SIC codes starting with 19-39. All manufacturing of products in Washington.

- *Wholesale, Utilities, Transportation, Communication (WUTC)*: Includes SIC codes starting with 40-42 and 44-51. This sector is comprised of transportation services, communication and utilities.
- *Retail*: Includes SIC codes starting with 52-59. This sector is comprised of stores and retailers of products.
- *Service*: Includes SIC codes starting with 07, 60-67, 70, 72-74, 75-76, 78-81, 83-84, 86, 89. This sector is comprised of all services provided to Washington (ex: plumbing, construction and cleaning services).
- *Government/Education*: Includes SIC codes starting with 43, 82, 92-97. This sector is comprised of universities, colleges and government buildings.

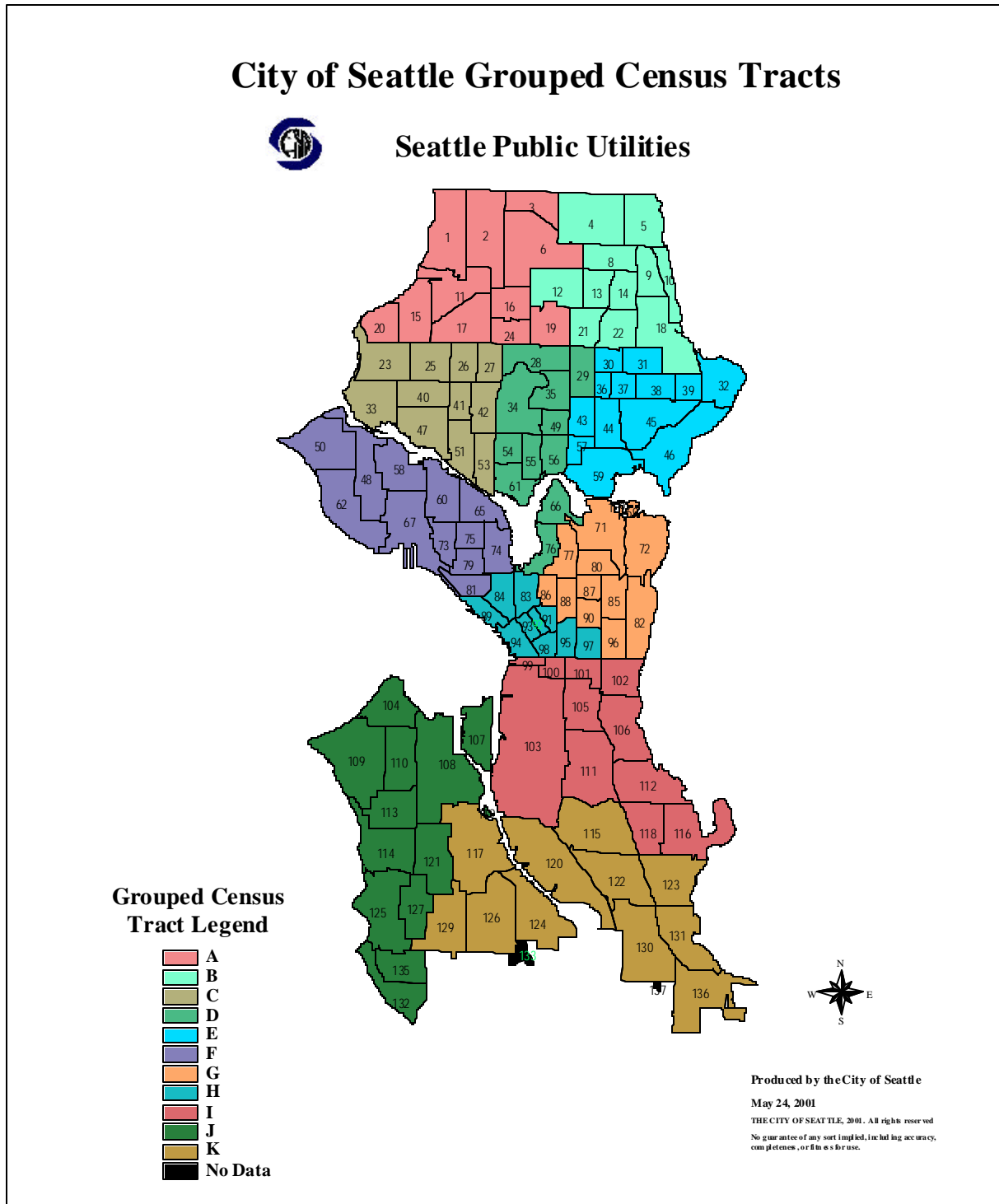
Establishing the research foundation to create this project is comprised of three outside data sources. By using the United States Census Data, Puget Sound Regional Council (PSRC) Transportation Analysis Zones (TAZ) and SPU's WaterBIRD, the new database measures water use by desired characteristics. Collection of the data took place through the SPU data files, special request from PSRC and on line population libraries and maps. Microsoft Excel housed the data and served as the main tool for calculation and graphing the necessary data outputs.

The terms used in this project relate directly to measuring and defining water distribution by SPU. The special terms used in this research are:

- **Water Resource:** Water viewed as a limited natural resource in Seattle.
- **Water Use:** The various ways water is used. Particularly in specific category sectors, areas and seasons.
- **Water Conservation:** Conserving water use to ensure enough resources for freshwater species, recreational use and urban use.
- **Water Consumption:** The amount of clean water consumed, through drinking, landscaping, indoor use (eg: toilets, showers), outdoor (eg: car wash, fountains) and manufacturing.
- **Resource Indicator:** The use of clean water as an indicator of the available natural resources in the ecological system.
- **Growth Neutral:** An indicator accounting for population growth.
- **Grouped Census:** The combination of 11 Census Tracts from the 1990 Census into larger tracts. 11 new tracts were created and alphabetically labeled.

The three databases provided the raw data to calculate per capita, Grouped Census tracts annual water use and seasonal water use. The US Census tracts were obtained through PSRC. PSRC comprises employment data and population data in the Puget Sound area. PSRC distributes its own private and public sector agencies with an annual business survey to obtain private records of gross income, gross expenditures and other characteristics of firms. PSRC uses the US Census tracts to track population and employment data for continuity. The population data by US Census tract for residential water use was used in the calculations within multi family and single family.

Figure 4: Grouped Census Tract Map



Source: Seattle Public Utilities ArcView

First, new groupings of category codes were created to broaden the number of tracts to track. There are 121 US Census tracts in the City of Seattle. From the 121 sectors, the project broke them equally into 11 groups of 11 tracts (Figure 4). The tracts were divided by proximity of location, therefore creating 11 clusters of tracts. All tracts were converted from 1990 US Census tracts (APPENDIX B) into labeled alphabetically starting with A and ending with K. This was to avoid confusion with US Census tracts. The new sets of tracts were named Grouped tracts. As seen in Figure 4, the 1990 Census Tracts are written with the color coded alphabet Grouped Census tracts. These Grouped Census tracts were created for the purpose of this research report.

The employment data obtained through PSRC is a combination of US Census tracts and PSRC own surveys and census. PSRC uses TAZ to measure a smaller aggregated area within US Census tracts. This allows for more accurate measurements, yet for this project, TAZ is converted into larger areas to represent grouped US Census tracts. In collecting this data in larger sections, PSRC was able to provide more accurate representation of each census tract because of its rule against data being too revealing of businesses. TAZ is a much smaller unit of analysis and often if a business in a designated TAZ area represents more than 80% of the income, manufacturing or output in an area, the data is not included in public records. This is to protect the competitive edge of private business firms. But since the research calls for larger sectors, the data has been provided more accurate without misrepresenting the larger grouped censuses. The employment data provided by PSRC consists of the number of employees in each category sector by census tract.

WaterBIRD is the database maintained by SPU. It contains all the customers and their seasonal use in daily CCF amounts. For example, each customer is assigned to a service number that is unique to the property and the amounts are calculated in CCFs/day. From WaterBIRD the amount of water per season is multiplied by the number of service days a customer received to get the total amount per season. For annual totals, each season is added together.

Using Microsoft Access, the data was queried and calculated into totals. Queries were created based on category sector and the new Grouped Census tracts. Included in the queries were the years, in order to have cross comparison over time. Afterwards, the data was imported into Microsoft Excel worksheets based on Grouped Census. The data was completed by adding the employment from TAZ data and population data from the US Census Bureau via PSRC. This data was also queried through Access and imported into Excel. Calculations on per capita/per employee were performed in Excel.

To obtain per capita/per employee, simple division of the total amount of water by the population was employed (Figure 5). Per capita/Per employee is growth neutral. The seasonal use indicates the variations in use according to time of year. The three main calculations are to compare per capita/per employee over time, by Grouped Census, by category sector and seasonally.

Figure 5.

Formulas	
Per capita	$\frac{\text{Water Use}}{\text{Population}}$
Per employee	$\frac{\text{Water Use}}{\text{Employees}}$
Seasonal use	$\frac{\text{Interested Season}}{\text{Population}}$

The data obtained from the simple divisions were then plotted based on total use by Grouped Census tracts, category sectors and seasonal use. To assess high, medium and low water users, the average is used to illustrate extreme users within each category sector. Using the mean as the definition of medium water use enabled the analysis to assess higher and lower water users.

Also, within the commercial sectors, there were only four years of employment data available; therefore averages were used in 1997. The data was found by taking the total of 1995 and 1998 per employee water use and dividing it by 2 to find the mean. For Government/Education, there is no 1996 and 1997 data, therefore the same process of finding the average between 1995 and 1998 were employed. The formula for the average was

$$(((1995 \text{ per employee water use} + 1998 \text{ per employee water use})/3) + 1995 \text{ per employee water use}) = \text{assumed } 1996 \text{ per employee water use}$$

$$(\text{assumed } 1996 \text{ per employee water use}) + ((1995 \text{ per employee water use} + 1998 \text{ per employee water use})/3) = \text{assumed } 1997 \text{ per employee water use}$$

This data was created as a placeholder for continuity of the curves and is not a reflection of the actual water use.

Through simple division, each category sector produced averages per capita that reflected location, season and sector use within the City of Seattle. Residential sectors are more seasonally sensitive to water use than commercial sectors. Almost all sectors have a higher summer use than winter use, but in the commercial sector the difference in curves is minimal, whereas in residential it is extremely noticeable. There is a relationship between the amounts of residential homes with the amount of water use in the 11 census tracts. Similarly, for the amount of commercial firms in a census tract is related to water use amounts. This indicates a high concentration of any one sectors relates to the amount of water use. For various reasons, this concentration is occurring. Often the explanation is related to the category and the location.

In analyzing the data, it is clear that there are fluctuations due partly to drought and heavy water conservation measures during water shortage years but there are less clear explanations for large increases. Comparisons between the two sectors illustrate the amount of water used in residential, comprised of single family and multi family, and commercial, comprised of government/education, manufacturing, warehouse/utilities/transportation/communication, service and retail. This is important to show how sectors rank among each other, regardless of their characteristics water consumption.

Single Family Analysis

In single family, water use clumps into three main groupings when compared by Grouped Census tracts (Figure 6). On average, a single-family home uses between 32-34 CCF per season. Of course seasonally there are great variations in water use. By comparing across Grouped Census tracts, the larger-level water consumers the mid-level water consumers and lower-level water consumers can be aggregated. During the summer, SPU encourages customers to use less than 5CCFs/ month, therefore hoping for no more than 15 CCF/summer.

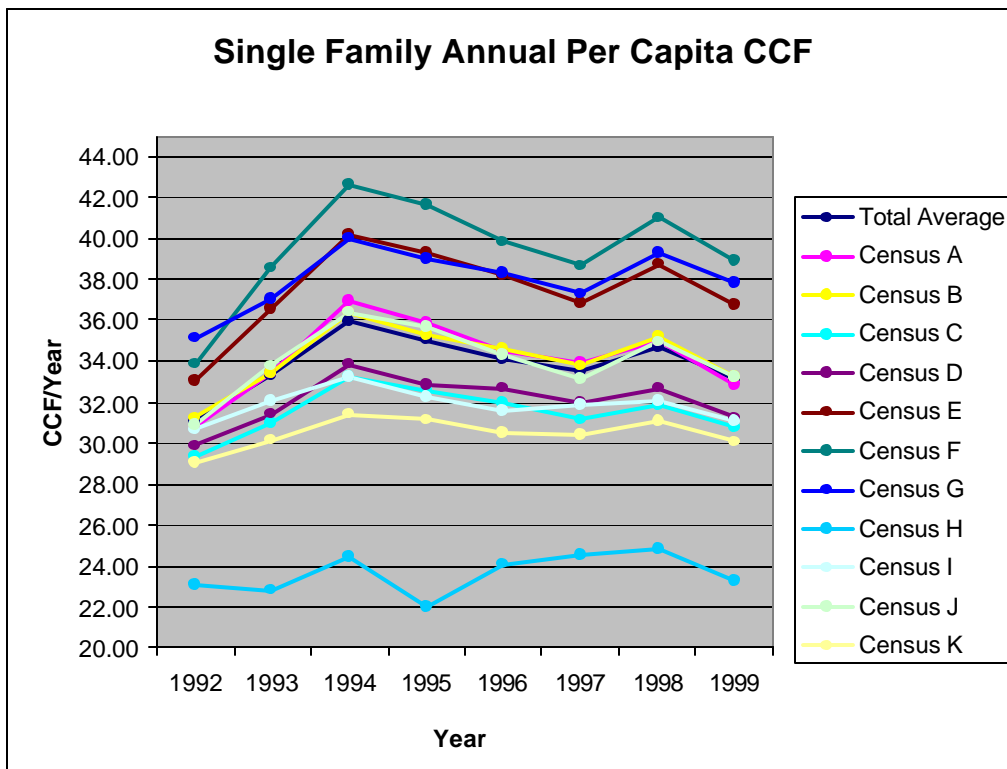
Figure 6 depicts the annual per capita water use for each census tract. In comparing the Grouped Census tracts and the total of the census tracts by per capita, there are striking differences and grouping of tracts. Grouped Tracts F, G and E consistently used more water than the other tracts. Also, it is much higher than the total, which can be assumed to be the average. These tracts are located in areas near Lake Union and Lake Washington. They are also characteristically much higher valued homes and are safer neighborhoods. This suggests but does not prove homes located more affluent neighborhoods relates to higher water use.

Grouped Tracts J, A and B performed almost exactly like the total average. And although the low-level water consumers are below the total average they have performed only slightly under the mid-level water consumers. Within these tracts, there is clustering

around the total average. The slightly lower Grouped Tracts were C, D, I and K. The outlier is Grouped Census H, which does not contain many single-family units, has very little water use. The assumption drawn from this is the few single-family homes located in downtown and surrounding areas use very little water.

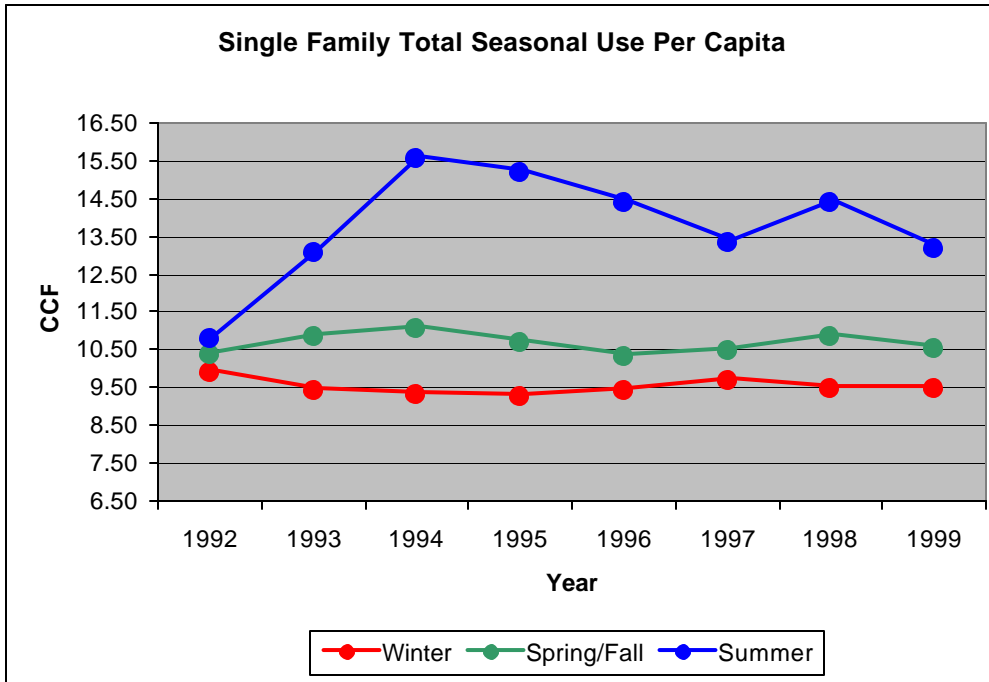
Overall, most of the Grouped Tracts followed similar trends. For instance, in 1994 there was a surge in water use from the previous years and in all tracts water use went up. The following three years, water use consistently makes a trend downward, implying a slow decrease per capita. Again, the same observation of higher water use is observed in 1998. In 1998 water use increases but the following year it decreases.

Figure 6: Single Family by Grouped Tract



Overall, the seasonal differences mirror the seasonal trends that residential units experience throughout the year; and that consists of higher use during the summer. Figure 7 shows the seasonal trends per capita. Winter is the absolute lowest use and spring/fall is consistently close to winter. Summer resembles the fluctuations in total average and each Grouped Census (Figure 6). In 1994, there is a significant increase in water use and then a gradual decrease; then again in 1998 there is an increase followed by a decrease. In 1992 the graph indicates almost no difference in use between the seasons. This maybe explained by WaterBIRD's having invalid measurements during the second year.

Figure 7: Total Average by Season



Within each individual Grouped Census tract, generally there are similar curves to the total average (Appendix C). The peaks are 1994 and 1998 and each tract contains similar amounts of water use trends. The only significant difference from the total average is Census H, which averages between 22-24 CCF/year (Appendix C: Graph C8). There is noticeably a much smaller margin between the seasonal uses. Summer is closer to the other seasons. Census H is located in downtown Seattle and has a much smaller population than the other tracts. The average population of Census H is 2,680, whereas the total average of all the Grouped Census tracts is 29,862.

Figure 8: Average population of Single Family Census Tracts

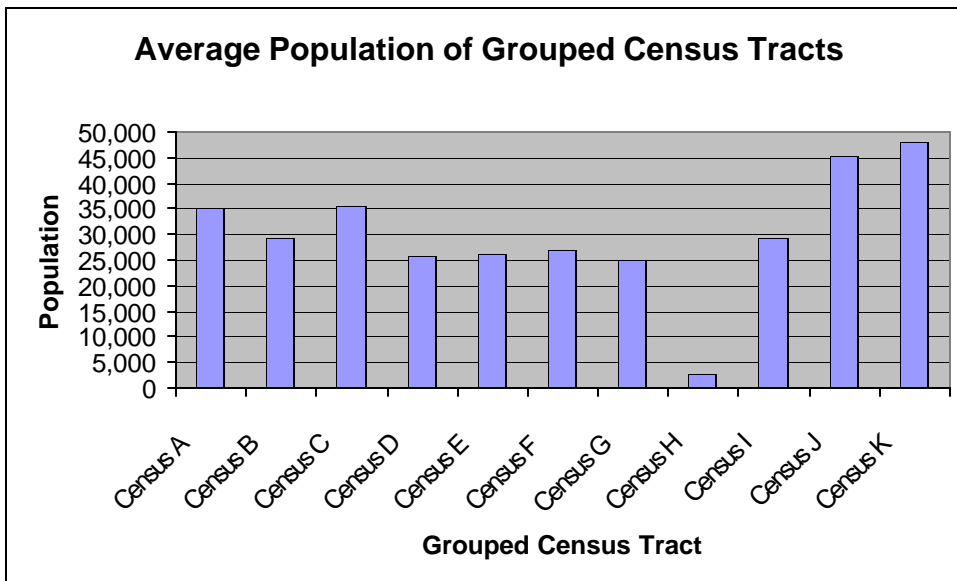
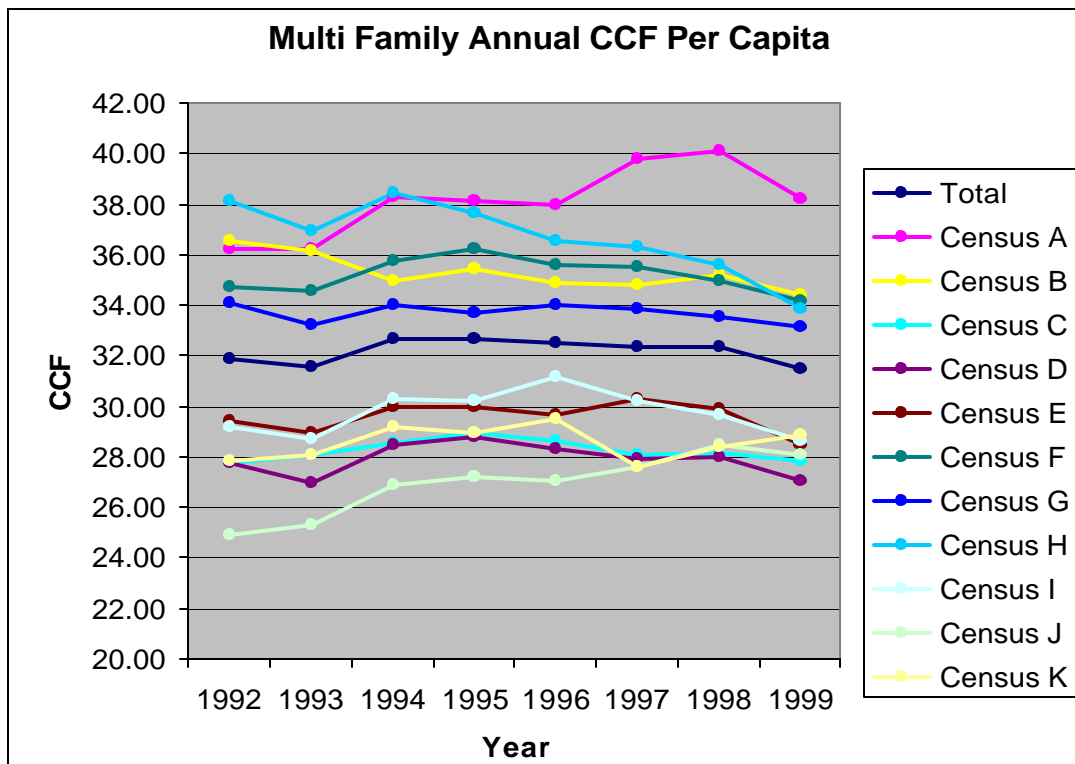


Figure 8 depicts the average number of people each year within the individual Grouped Census tracts. Clearly there are much fewer people in single-family homes in Census H because of its location. Therefore, Census H uses much less water per capita suggesting the lots sizes are smaller, less water devoted to landscaping, and smaller homes. Census J and K (Appendix C: Graph C9 and C10) are located in south Seattle with characteristically more single-family homes than the rest of Seattle. Although they both have similar populations, Census J uses roughly 2-3 CCFs more per summer than Census K. This suggests there are other characteristics, such as income, lot size and density of residential neighborhoods that determines such a large difference.

Multi Family Analysis

In multi family, there is less consistency within each Grouped tract and comparisons against the average total water use per capita show stratification above and below the average total (Figure 9). Figure 9 shows the various levels and consumption patters of each Grouped Census tract. Among each Grouped tract there is little consistency to the average total. For example, Census A has drastic increase in 1996 and 1997; yet conversely Census C has a significant decrease annually from 1994 until 1999. Both Grouped tracts are close in location, but this indicates other variables are confounding a consistent measurement of water use. Aside from the inconsistencies within each Grouped tract, there is a larger range of amount. From 40 CCF per capita in Census A to as little as 25 CCF per capita in Census J, it shows the various levels of use are dependent on location.

Figure 9: Multi Family by Grouped Census Tract



Using the mean as the average for all the Multi Family population, it indicates Grouped tract related to water use. Based on location Census A, B, C, F and G are above the average total, whereas Census D, E, H, I, J and K are below the mean. According to their location, most of north, northwest and one section of east Seattle use above the mean. On the other hand, south Seattle and the heart of Seattle use below the mean. The difference in water use is not highly related to the number of people living in multi family homes. According to Figure 9, high, middle and low populated Grouped Census tracts are evenly distributed consumers. Characteristically, location is more significant than population size.

Figure 10: Multi Family Average Population

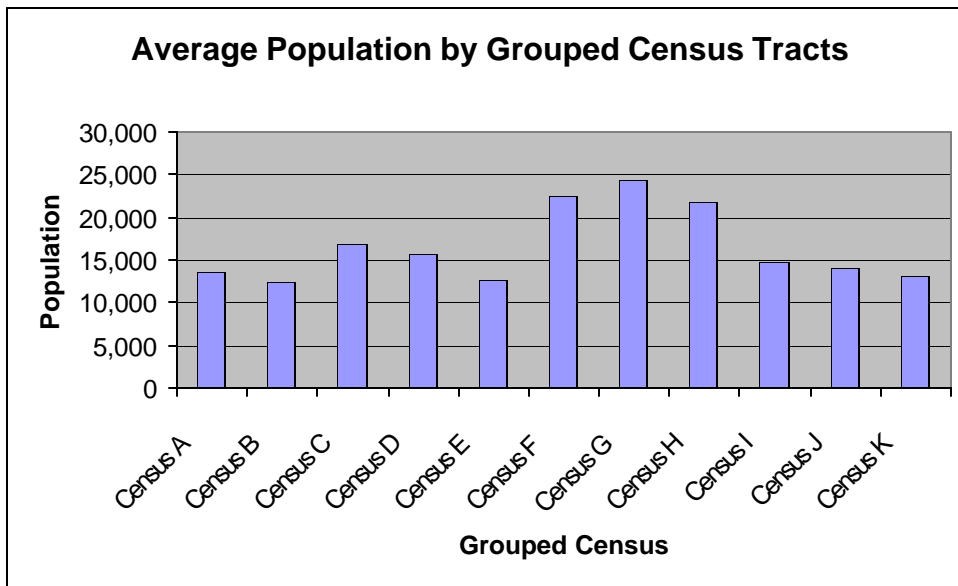
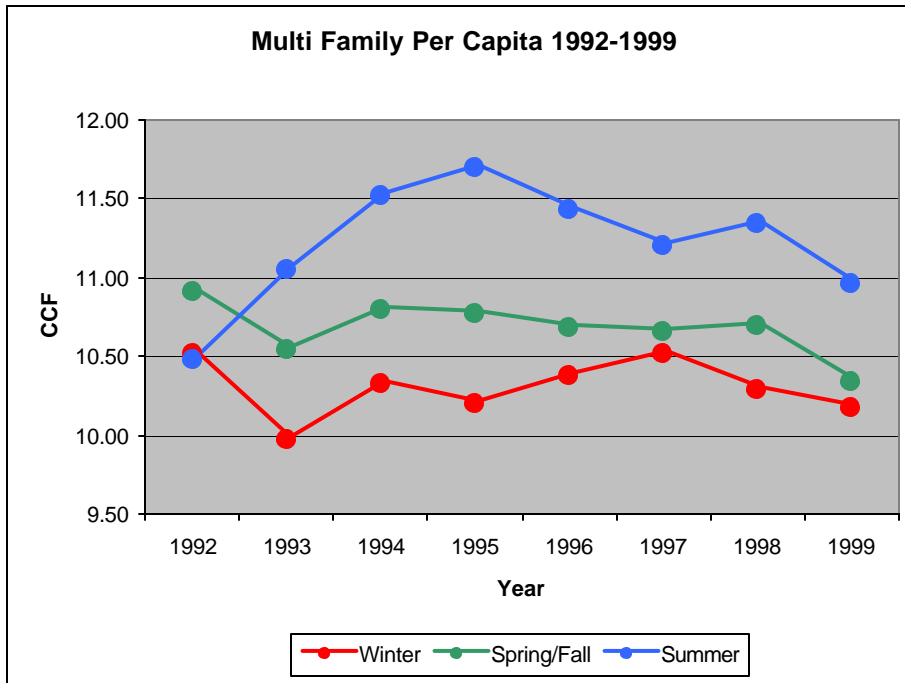


Figure 10 depicts the number of individuals within multi family units. The average is 16,530 per tract, but Census F, G and H are much higher than the mean. There are a significant number of apartments and condominiums in the Seattle central area. Aside from its popularity and location, tract G shows lower per capita water use (Appendix D: Table D4-D6). This implies a higher concentration of people in the heart of the City, where there is an above average use according to Figure 9.

Seasonally, multi family is characteristic of high summer water use and lower winter water use (Figure 11). Spring/fall and winter use do not follow closely year by year, and come extremely close to meeting in 1997 and 1999. In 1995, there is a gradual increase in summer per capita seasonal use and then a decrease in proceeding years until 1998, where water use goes up again. It proceeds to decrease in 1999. Although winter is assumed to be lower than summer, it has greater fluctuations and does not follow the curve of summer water use. In fact, in 1997 the two curves starts converge, showing a smaller margin of use between summer and winter during the year.

Figure 11: Multi Family Total Average Seasonal Use

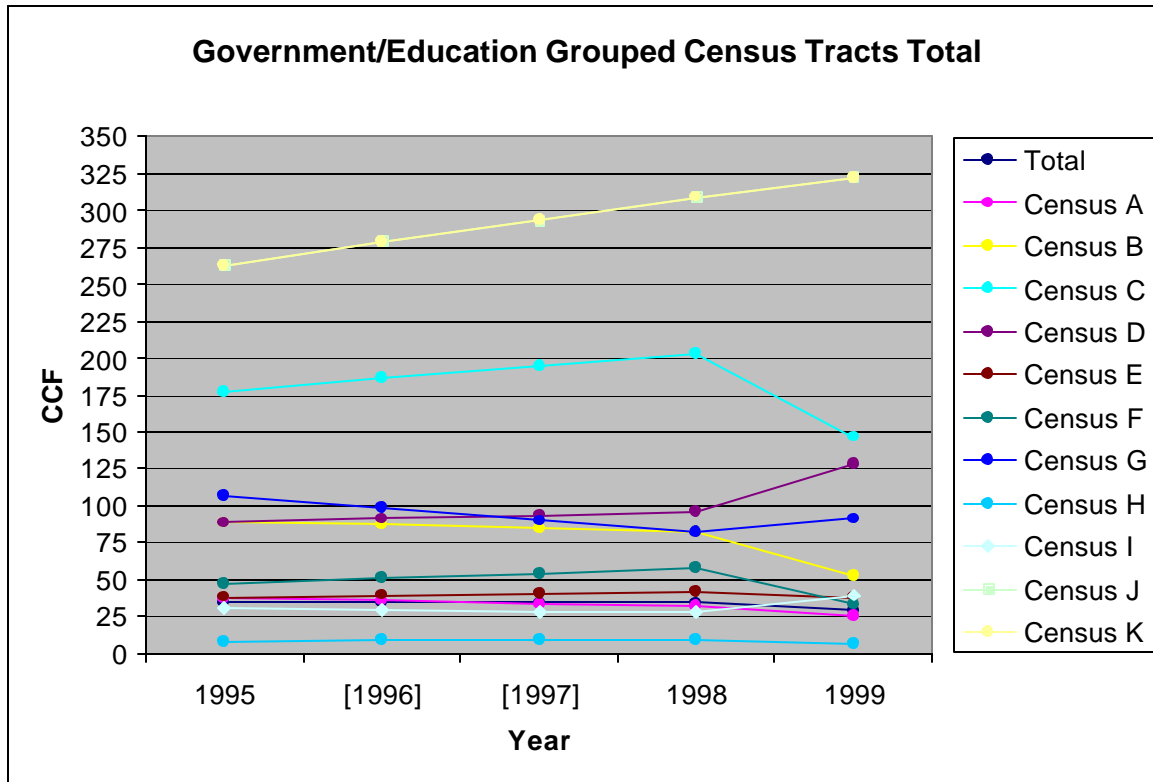


Characteristically, multi family homes use the greatest amount of water indoors. Often the number of indoor appliances determines the amount of water used. A washing machine and dish washing machine add to water use compared with multi family units without such amenities. Also, the number of bathrooms determines level of water use. This suggests some measures to reduce water use were employed in 1995 and continued to reduce water use per capita in summer yet there is an increase in water use in winter.

Government/Education Analysis

Within the government/education sector, location and the number of individuals does not highly correlate to high water use per capita. In most cases, the high consumers of water in government and education are located in outlying areas. The assumption is that downtown and the larger universities would have high water use per employee due to the number of outside people who use government services, yet are not counted in employment surveys. Another difficult determining factor for government and education is the amount of missing employment data. Two out of five years are perceived averages, which increased the margin of error. But based on the other trend points (1995, 1998, 1999) there is still much higher use among outlying areas. Seasonally, there are minimal fluctuations in the curves.

Figure 12: Government/Education by Grouped Census Tract



Note: 1996 and 1997 are averages that are evenly distributed between 1995 and 1998. To denote the missing data and the use of averages [1996] & [1997] are placed in brackets.

Using the total average as the medium consumption level for government and education, most of the curves lie near the mean. This indicates that the total population of employees in government and education are using similar amounts of water. The greatest outliers are Census B and Census C. Between the two outliers, Census B employees are consuming as much as 200 CCF/employee more annually than the mean. Similarly, Census C employees are consuming 100 CCF/employee more annually than the average. Census B & C are located in north Seattle where there are few government or educational institutions. This implies that the employees of these areas are consuming more than their neighbors.

Figure 12 shows the total water use by Grouped Census tracts. Surprisingly, Census E and H, which contain higher numbers of government and educational institutions, do not have extremely high water use. Per employee they are performing similar to smaller number of individuals. Census E contains the University of Washington. The University of Washington employs 25,000 individuals alone. Although in Census G, which contains Seattle University, Seattle Central Community College and a handful of government offices yet still have manageable water use does not have such a significant number of employees. In general, educational institutions would be assumed to have higher water use because water consumption services (eg: toilets, showers) are used by both employees and non-employees (eg: students).

Figure 13: Government/Education Average Number of Employees

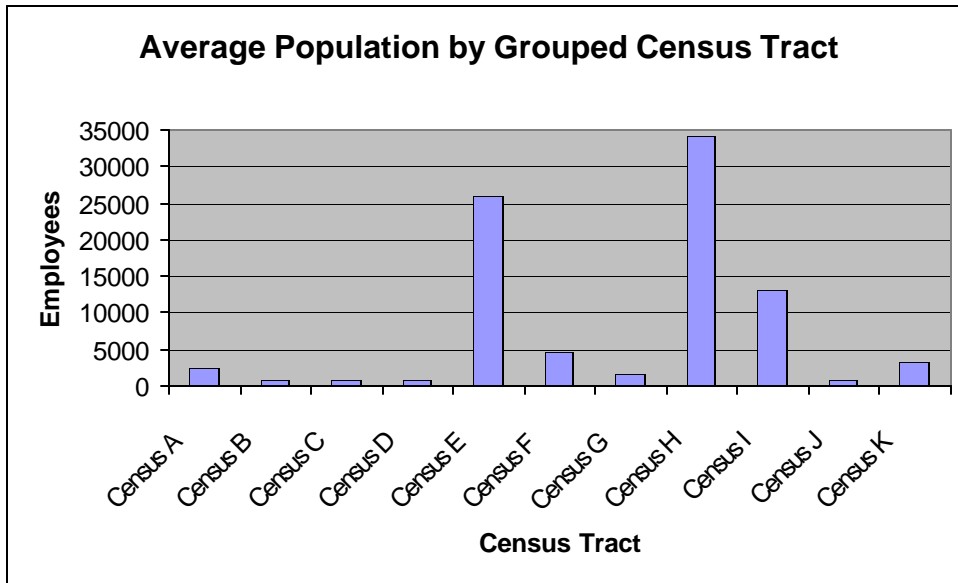
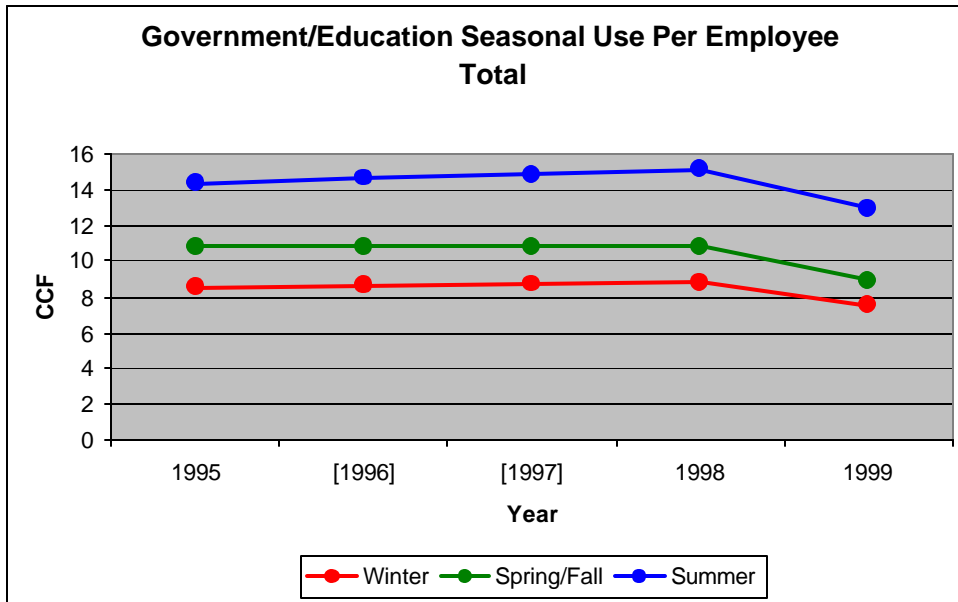


Figure 13 shows the average population of employees for each Grouped Census tract. In Census H are the majority of local governmental offices operating from downtown Seattle. According to Figure 13, there are 34,000 employees working in Census H. Seasonally, this tract has a fairly constant water use throughout the year (Appendix E: Graph E8). In 1999, there was a decrease in water use from 1998 and the average 1997 and 1996 years.

For Census E, there is also minimal water use variation due to the seasons. Figure 14 shows the varying seasonal trends overall for all the Grouped Census tracts. Summer is still the highest water use, followed by spring/fall and winter is the lowest, but the three curves follow each other (See Appendix E: Graph E5). Interestingly, Census E water use curves are extremely close to other another throughout the graph. This indicates that winter use and summer use minimally change annually.

Overall, the seasonal use curves do mimic the curves found in the Grouped Census tracts individually. Figure 14 shows the seasonal trends to be fairly constant throughout the five years. Again, there is sharp decline in 1999 from the previous four years. All the curves follow the same pattern and do not cross, therefore implying a constant use regardless of season. Yet, there is high use during the summer and spring/fall years over winter.

Figure 14: Total Seasonal Use Per Employee



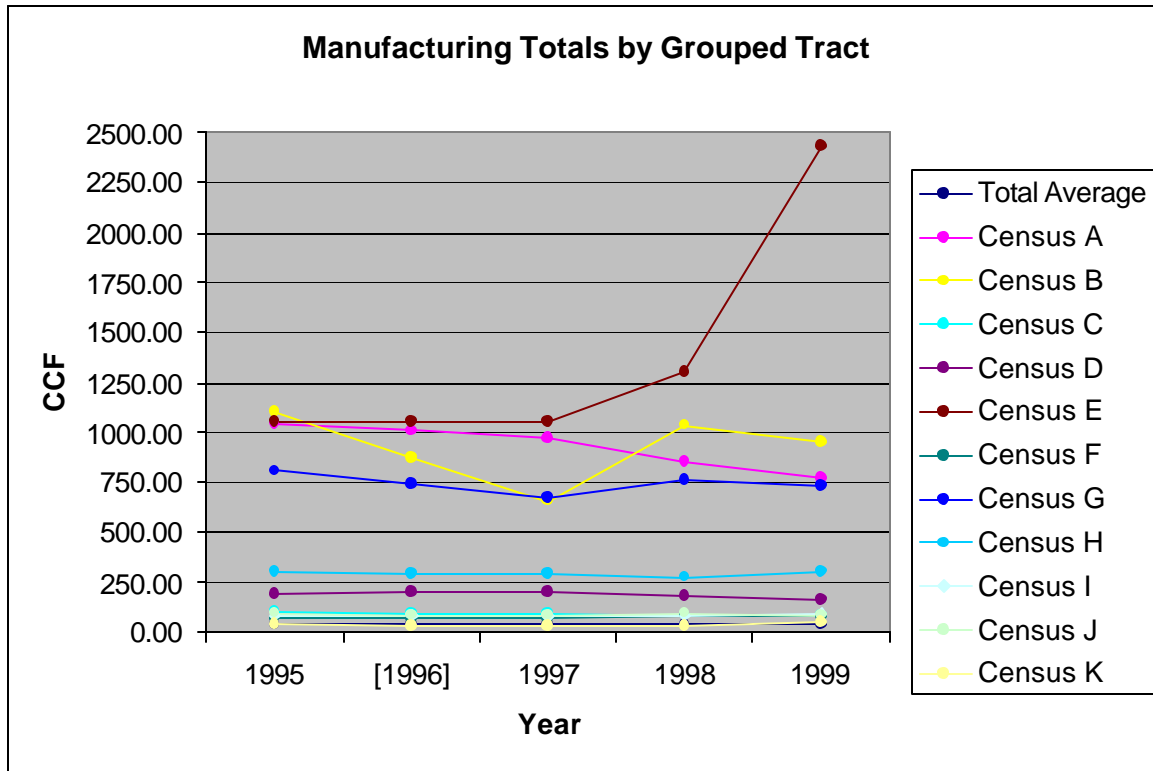
In the government/education sector, there are minimal variations between seasons and fairly constant use. In 1999 there is a noticeable decrease in water use. In looking at the Grouped Census tracts compared to the number of employees, there is no relationship with high use. Aside from establishing Census B and C are high consumers, there is no concrete evidence to explain. It does imply that these areas need to be monitored to extract the exact nature of their high water use.

Manufacturing Analysis

Manufacturing uses the highest amount of water among all of the category sectors. Figure 15 graphs the water use in Manufacturing, particularly, there are many tracts that are fairly low, but four tracts that are extremely high in water use. Even among the lower water consuming Grouped Census Tracts, there is still extremely high use compared to the other sectors. Characteristically, manufacturing requires higher water use, regardless of the number of employees. Within manufacturing there is the most amount of variation per employee and there is virtually no relationship between the number of employees and level of water use. Overall, each Grouped Census tracts does not fluctuate greatly each year or season. The outlier is Census E. Census E fluctuates from 1000 CCF/year to as much as 2400 CCF/ year (Figure 15).

In Figure 15, there is a fairly low average water use of 60 CCF/year but there are tracts that have much higher use, such as Census A, B, E and G. On the whole, this implies most manufacturing companies do not have excessively high water use. Aside from Census E being extremely high in water consumption, Census A, B and G are much higher than any other Grouped Tract or category. Tract A and B are located in north Seattle and G is located in east Seattle.

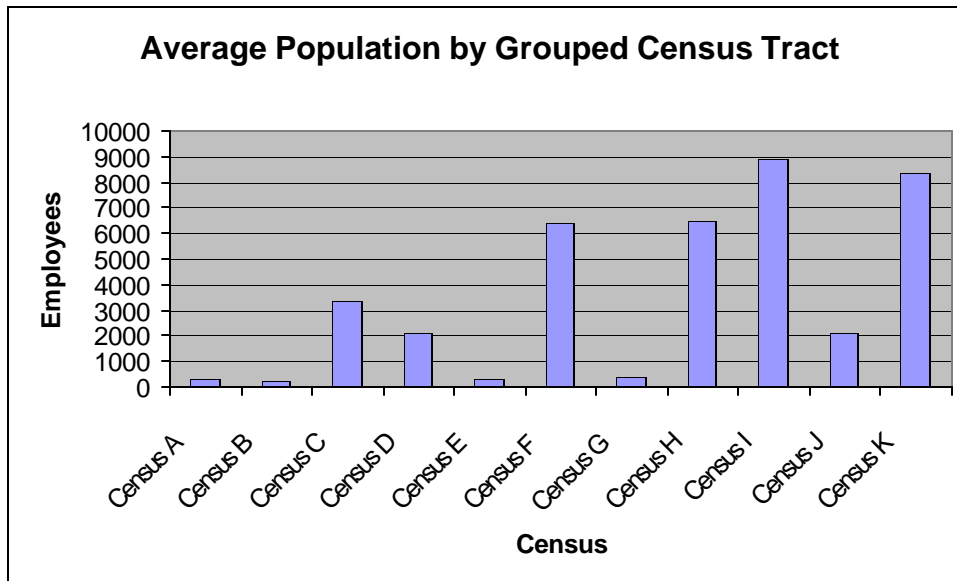
Figure 15: Manufacturing Total by Grouped Census Tract



Note: 1996 is an average evenly distributed between 1995 and 1997. To denote the missing data and the use of averages [1996] is placed in brackets.

According to the population, A, B, E and G contain the lowest number of employees yet within these sectors they have the highest use. Figure 16 shows the average population by Grouped Census tract. Notice the fluctuations in the number of employees, which implies higher numbers of employees in certain tracts. Census C, F, H, I and K have extremely high employment.

Figure 16: Manufacturing Average Number of Employees

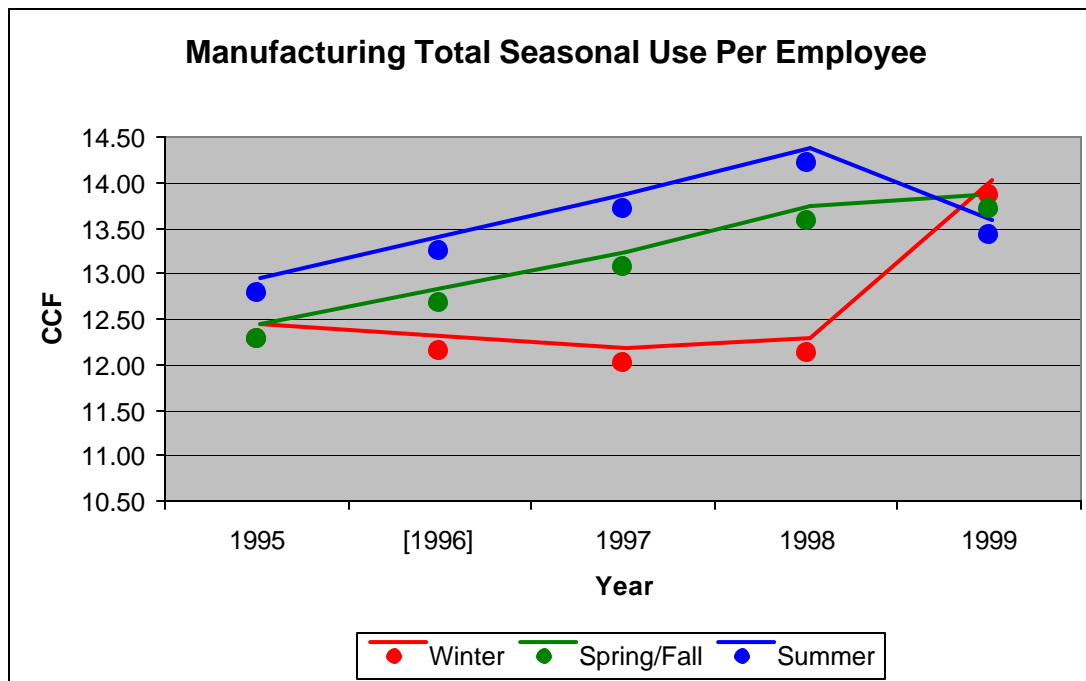


The lower water using Grouped Tracts follow similar trends and there is minimal fluctuation. Census C, F, I, J and K are gathered around the total average. These Grouped Tracts coincidentally have the highest number of employees, therefore suggesting manufacturing that consumes less water but with many employees. Most of the manufacturing businesses are located in west and south Seattle where there is fewer residential areas. Also, these areas located farther from the center of the city.

Figure 17 shows the seasonal total seasonal water use per employee. As depicted in Figure 17, 1998 was a turning point for seasonal water use throughout manufacturing. In the winter there was sharp increase in water use, due largely because of Census E; whereas in the summer and spring/fall there is a decrease in water use. In general, the individual Grouped Census tracts do not fluctuate seasonally. Water use is constant throughout the year with summer being the highest consumption. The total average seasonal use does not reflect the individual tract water use. Census A, C, D, G, H and I consume water constantly both seasonally and yearly (Appendix F: Graph F4-F11).

On the other hand, Census B, E, F, J and K fluctuate annually. In Census B had a significant decrease in 1997 but increases in 1998 (Appendix F: Graph F2). Census E remains constant until 1997 when it exponentially increases from 400 CCF during the summer of 1997 to 1000 CCF during the summer of 1999. Employment in 1999 was drastically decreased from 273 in 1998 to 141 in 1999.

Figure 17: Total Seasonal Use Per Employee



Census F and J increase in 1997 and remain constant afterwards (Appendix F: Graph F6 & F10). They are both similar in amount of water use through the seasons. In

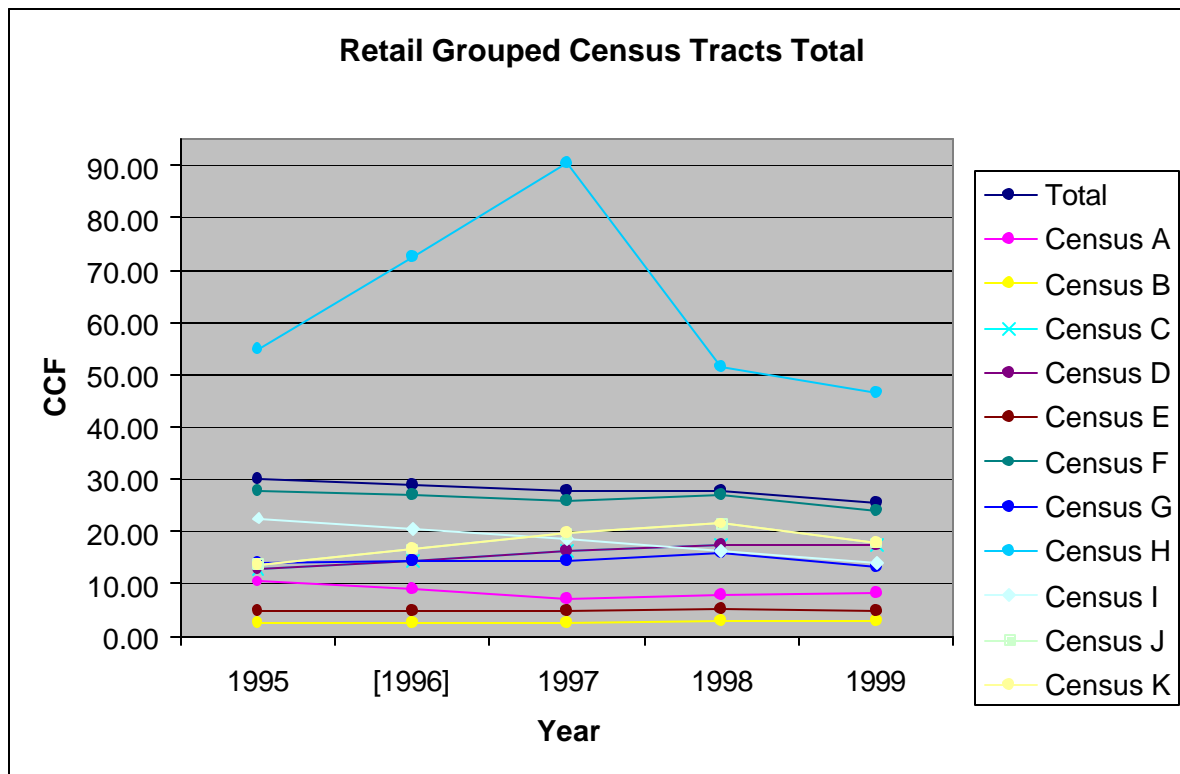
Census K, there is a constant water use seasonally and annually until 1999 when water use nearly doubles (Appendix F: Graph F11). This extremely increase is due to the number of employees decreasing by almost 50% yet water use stay constant from 1998 to 1999.

Most of the fluctuations are explained by decreases in the number of employees in each Grouped Census tract. Water use stays relatively the same throughout each year and within each tract, but employment is much less stable in latter years, such as 1999. Seasonally, there are minimal changes throughout each tract. There is a relationship to large number of employees and lower water use per capita, whereas the lower number of employees means higher water use. This relationship could be the result of high intense water manufacturing firms locating with few other manufacturing businesses. Also, the nature of the business may require more water and fewer employees.

Retail Analysis

In the retail sector, there is low water use virtually across all Grouped Census Tracts. Retail does not usually involved high water use. Selling products usually requires minimal water use for indoor plumbing and watering small areas of landscaping. Typically, retail often even shares those spaces, such as shopping malls where restrooms are communal and landscaping is sparse. As for seasonal use, retail remains constant year-round. In Seattle all, but two Grouped tracts, have similar number of employees. Overall, retail seems the most predictable and constant sector.

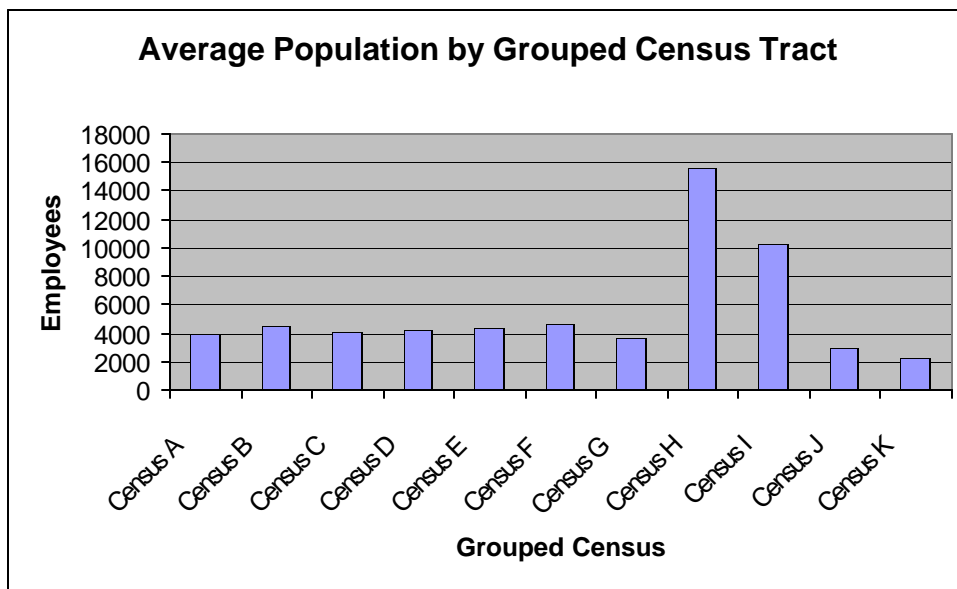
Figure 18:Retail Totals by Grouped Census Tract



According to the total average, most Grouped Census tracts are below 30 CCF/year. Figure 18 shows the total amount of water used by Grouped Census tracts. Most of the curves cluster under 30 CCF/year. In Figure 18, the one exception is Census H, located predominately in downtown Seattle. Census H's water use increases annually until 1997 when it peaks and sharply decreases. Overall, Census H is exceptionally higher than the other tracts even with the decrease in water use after 1997. The other Grouped tracts are clustered together with minimal fluctuations throughout the five years. Using the total average as the mean for water use among retail, all curves fall below the mean curve except Census H. This implies Census H is skewing the results higher.

The average number of employees in Census H is 15,624 and ranks as the highest population amount retail. Figure 19 graphs the average population within each Grouped Census tract. Location wise, downtown Seattle contains numerous retail shops, which accounts for the high number of employees. Also, Census I, south of downtown Seattle, has 10,292 employees. Census I also contains a high number of retail stores. Water use amount Census H is much higher than water use in Census I. Census I reflects similar per employee use as the other Grouped tracts, except for Census H. Census H has high water use along with a high number of employees. This may be an anomaly because the remaining tracts all have similar water use.

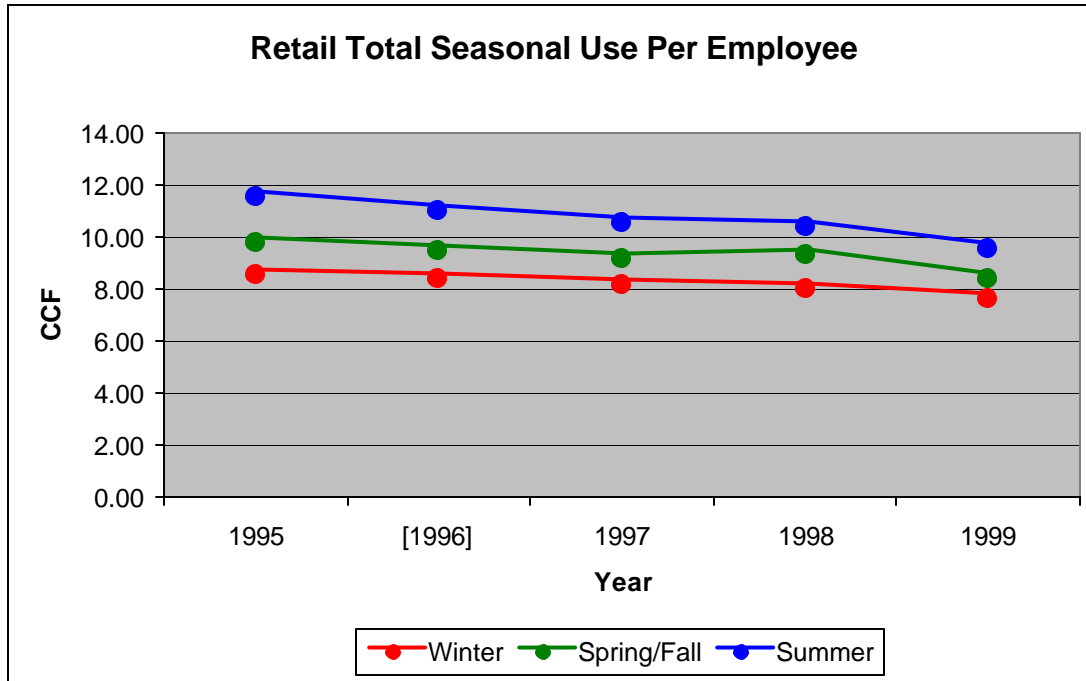
Figure 19: Retail Average Number of Employees



Seasonally, retail remains constant throughout the year with summer being the highest water use and winter being the lowest. In Figure 20, the graph shows seasonal use steadily reducing. The seasonal curves do not cross or fluctuate greatly. According to the total seasonal graph, there is a gradual trend downward in water use. Within the specific Grouped tracts, Census B, C, D, E, G and I contains seasonal curves that overlap, indicating no change in consumption during the year (Appendix G: Graph G2-G9).

Census A has overlapping curves from 1997 until 1999, but actually has a lower summer use in the first two years (Appendix G: Graph G1). All these tracts are located north or east in Seattle. This indicates retail stores in these areas have extremely consistent water use.

Figure 20: Total Seasonal Use Per Employee



Census F, J, K do not have overlapping seasonal curves, because of similar use, but rather have curves spread but still have a normal trend in water use (Appendix G: Graph G6, G10 & G11). Census J and K are located in south Seattle and F is west Seattle. Census H is the seasonal data with the most amounts of fluctuations. Until 1997, Census H was gradually increase water use per employee, and then it drops dramatically in 1998. From 1998 to 1999, there is another gradual increase. Among the seasonal use in Census H, the curves follow the same fluctuations. This indicates Census H uses various amounts annually.

Retail is constant and almost predictable in water use. Per employee water consumption is similar seasonally, annually and the population is fairly constant. This makes it easier to assume fewer fluctuations in the future. Overall, retail does not consume much water per employee, which suggests this industry has different needs than the other commercial sectors.

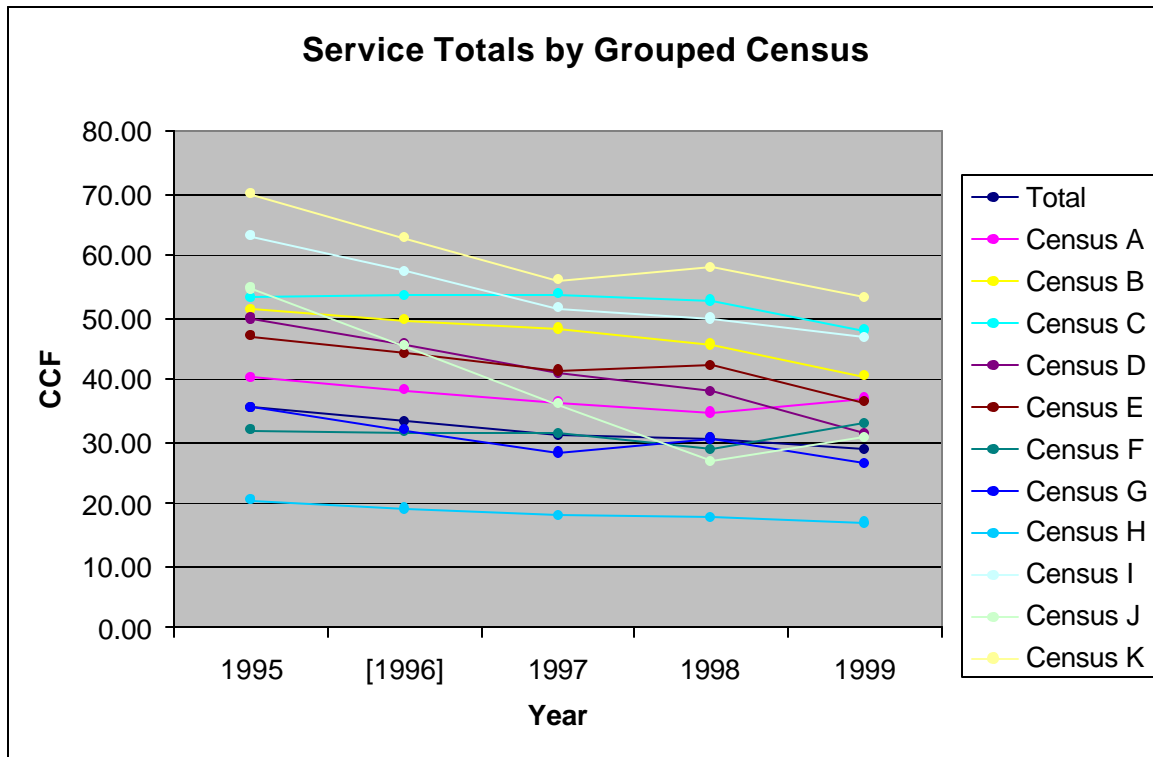
Service Analysis

The Service sector is the most contained with minimal fluctuations across Grouped Census tracts. The annual water use ranges from 20 CCF/year to 70 CCF/year. Since service is an extremely broad industry, including the finance, insurance and real

estate, yet the service component comprises the most of this sector. The service industry is broad, yet it still has relatively normal curves with minimal seasonal fluctuations. This industry typically does not use high amounts of water, except for services that are solely involved in water use. Census H contains the highest number of employees and the remaining tracts have similar numbers. Again, Census H is located in downtown Seattle where there are numerous service businesses.

As depicted in Figure 21, the total service curves are contained and follow similar patterns through the five years graphed. The greatest variation is by Census J. Located in southwest Seattle, Census J continues on a downward trend from 1995 to 1998 then starts to rise again in 1999. Coincidentally, it is one of the three tracts that rises in 1999, along with Census F and A. Overall, the Grouped tracts are declining or remain constant annually. Using the total average as the mean, most of the curves lie above it. This indicates the mean may contain some error from the gathering of total water use. But using the total average curve that is produce, most of the Grouped Census tracts are using higher amounts of water. Located in central Seattle, Census F, G and H are below the mean. Census J remains above the mean then dips below the mean after 1998.

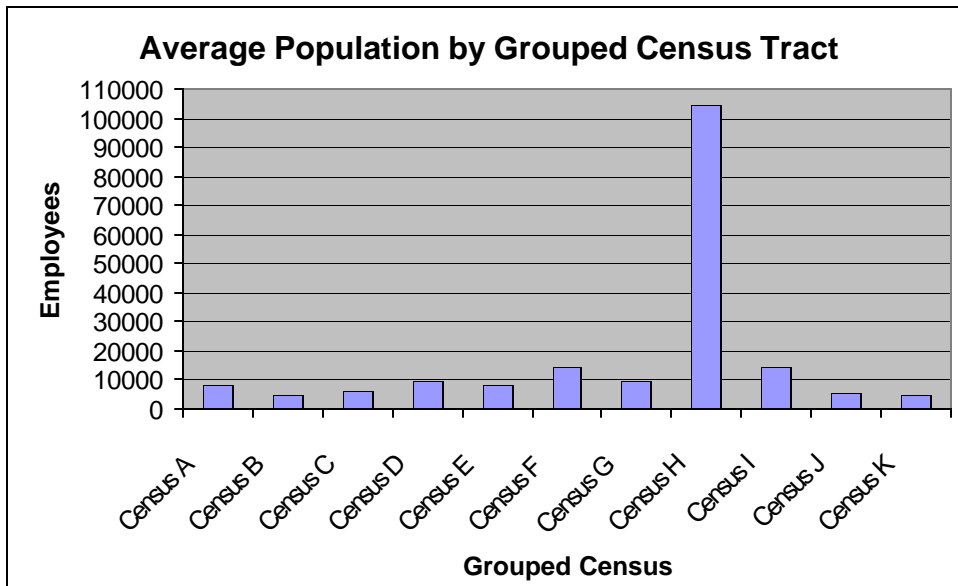
Figure 21: Service Total by Grouped Census Tract



As seen in Figure 22 showing total water use by Grouped Census tract, all tracts lie within the same area. Drawing attention to Census H, it contains the highest number of employees of the Grouped tracts but has the lowest water use. On average, Census H has 104,406 employees. The other tracts are grouped between 30-70 CCF/year and also

have between 4,998-14,605 employees. The higher use among tracts outside of downtown Seattle suggests the infrastructure and characteristics of water use in such areas is a significant impact. The infrastructure for downtown Seattle is set up to serve many service industries. The addition of businesses does not create extended additional services, whereas in the areas outside of downtown have a greater need for infrastructure. Also, the characteristics of downtown service business may not need as much water as the outlining areas. Typically, services in downtown are less related to water use (such as financial and legal services) because of the expensive leasing rates for smaller property spaces. On the other hand, services offered outside of downtown range in water use because of the various property sizes and leasing rates.

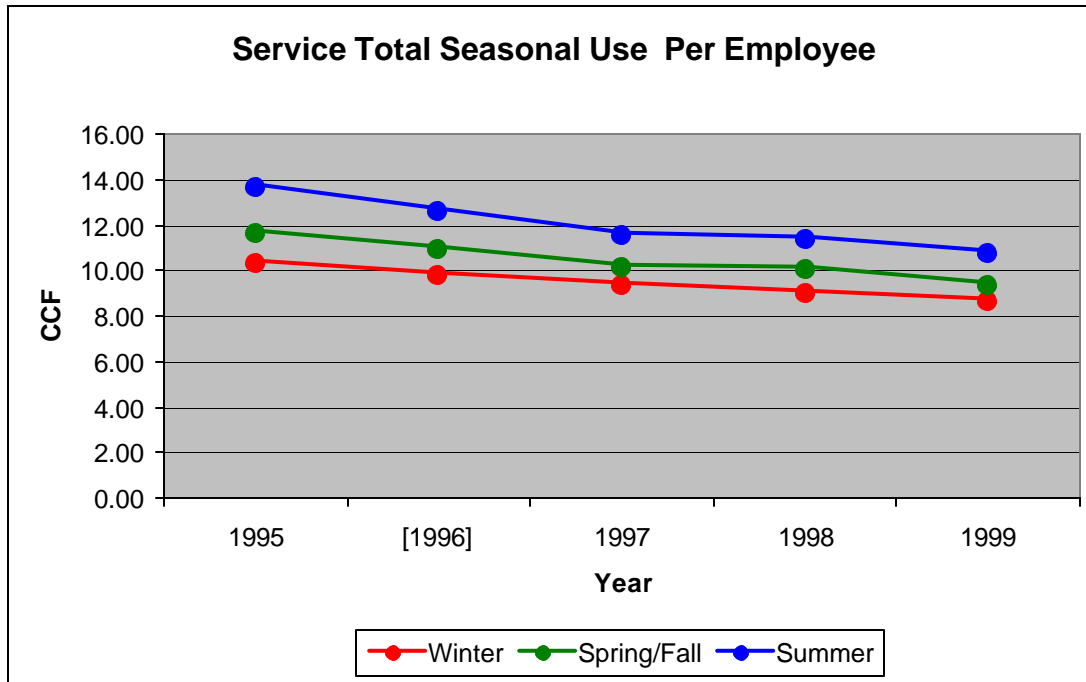
Figure 22: Service Average Number of Employees



Service follows similar curves of other commercial sectors for seasonal use. Figure 23 graphs the progressive trend downward in water use per employee. As seen in Figure 23, the total seasonal use per employee is extremely close, indicating virtually no change throughout the year. Of course summer remains higher than spring/fall and winter, but the lines do not cross and have been gradually decreasing. The average water use per employee ranges from 9 CCF/season to 14 CCF/season, which is quite low.

Seasonal use in Census B, C, D, I and J show curves with almost no change (Appendix H: Graph H2-H4, H9, H10). The curves of these tracts gradually have decreasing water use per employee. They also contain curves with strict trend lines throughout the year. These tracts are sporadically located in north, and south Seattle and therefore it is difficult to suggest characteristics about these areas. But it is apparent that these areas have extremely similar number of employees, water use and seasonal trends.

Figure 23: Total Seasonal Use Per Employee



Slightly less close curves in seasonal use are Census A, E, F, G, H and K (Appendix H: Graph H1, H5-H8, H11). Again these curves do not cross and follow the same path, but are farther apart. Summer is slightly higher in each case. Except for Census A and H, all seasonal curves are gradually decreasing in water use. Census H has the most abrupt curve downward in 1998. Census A has a small decrease from 1998 to 1999. This marginal difference in the seasonal user from almost no change to minimal change depicts the service category to be extremely constant.

On the whole, the service category does not consume high levels of water and the water consumed is at a constant rate. This helps in predicting future water use per employee. There is a gradual trend throughout the sector of decreasing water use therefore further measured to continue the trend should be instilled.

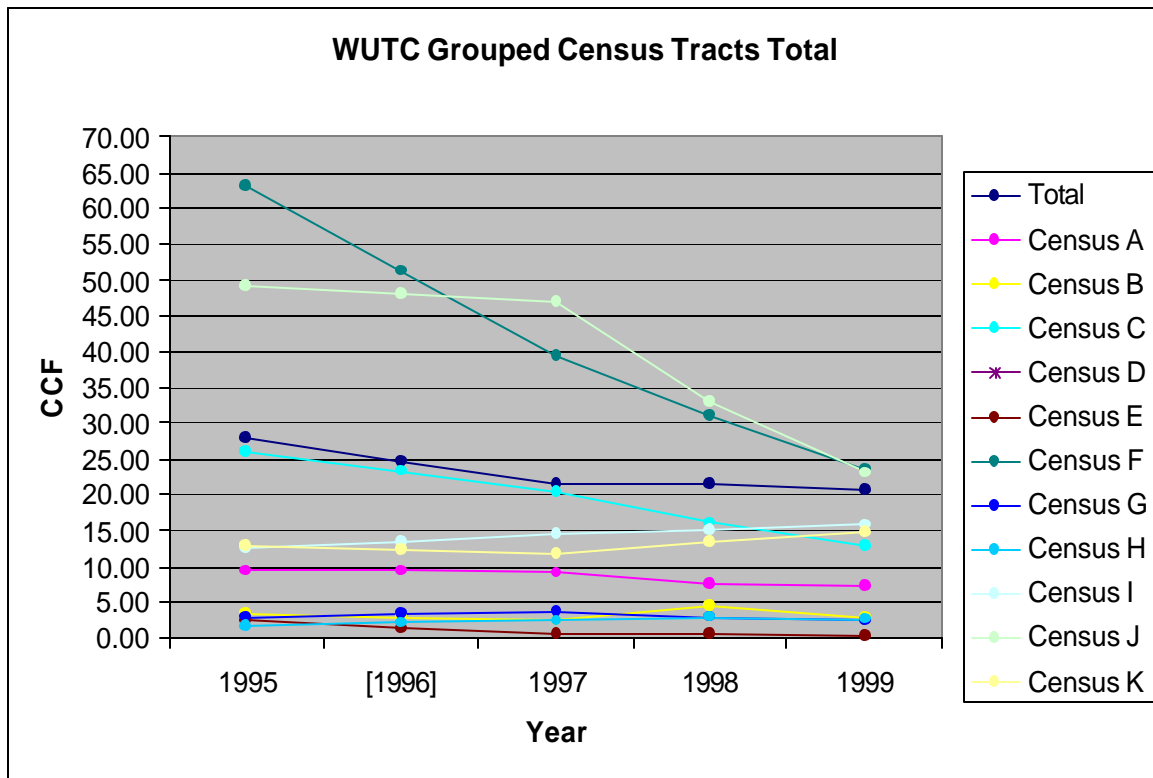
WUTC Analysis

Warehouse, Utilities, Transportation and Communication (WUTC) is the most sporadic with minimal correlation with number of employees in each tract, seasonal use and annual use. Similar to the service category, WUTC is comprised of many industries that have various SIC codes. Essentially, this category is comprised of large businesses that do not fit into the previous four categories. It is difficult to characterize this sector because of various industries, but in general there is not excessive water use per employee. Assumptions associated with WUTC are mainly indoor water use, such as plumbing. The range of business space is from warehouses to office firms, therefore

making difficult to associate certain water characteristics. The western Grouped Census tracts are irregularly high consumers.

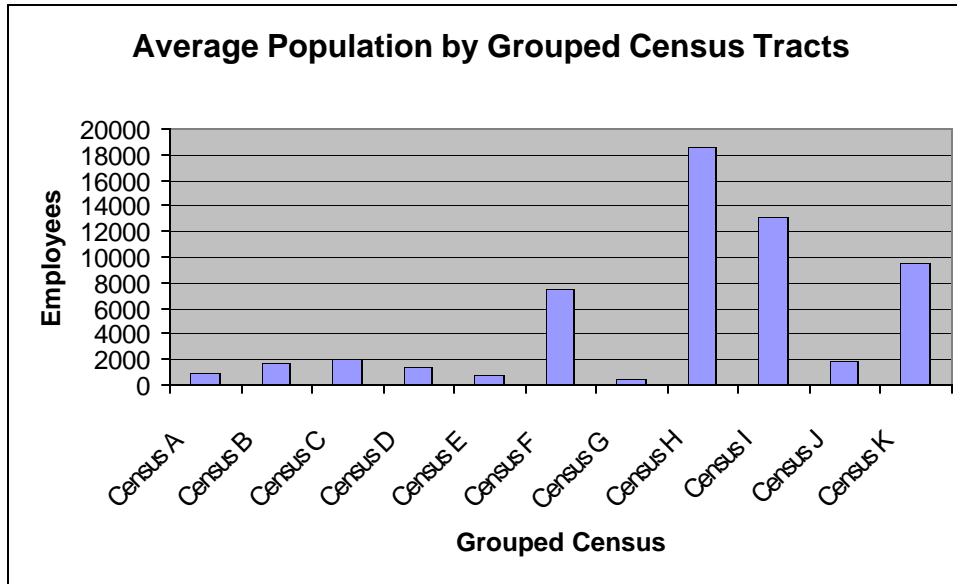
Figure 24 shows the amount of water used by Grouped Census tract. Notice Census F and J are extremely high water users starting in 1995 but gradually decrease closer to the mean by 1999. Census C is closest to mirroring the curve of the total average. These three tracts are all located on Puget Sound, which may indicate a high number of businesses located near a port, especially for warehouse. The remaining curves are well below the mean. Among those curves, there is constant water use per employee each year. The assumption with the constant water use tracts is there are fewer warehouses. Warehouses seem to add additional water use and characteristically, utilities, transportation and communication do not use as much water.

Figure 24: WUTC Total by Grouped Census Tracts



In terms of population and water use, Census H, I and K have the highest number of employees, yet they have average or below average water use per employee. Figure 25 depicts the average population within each Grouped Census tract. Using the population data and correlating it with Grouped Census tract, the higher users do not correlate with number of employees and water use. Census F contains a high number of employees and also experienced the most significant decrease annually. Census C and J have low number of employees yet consume higher quantities of water.

Figure 25: WUTC Average Number of Employees



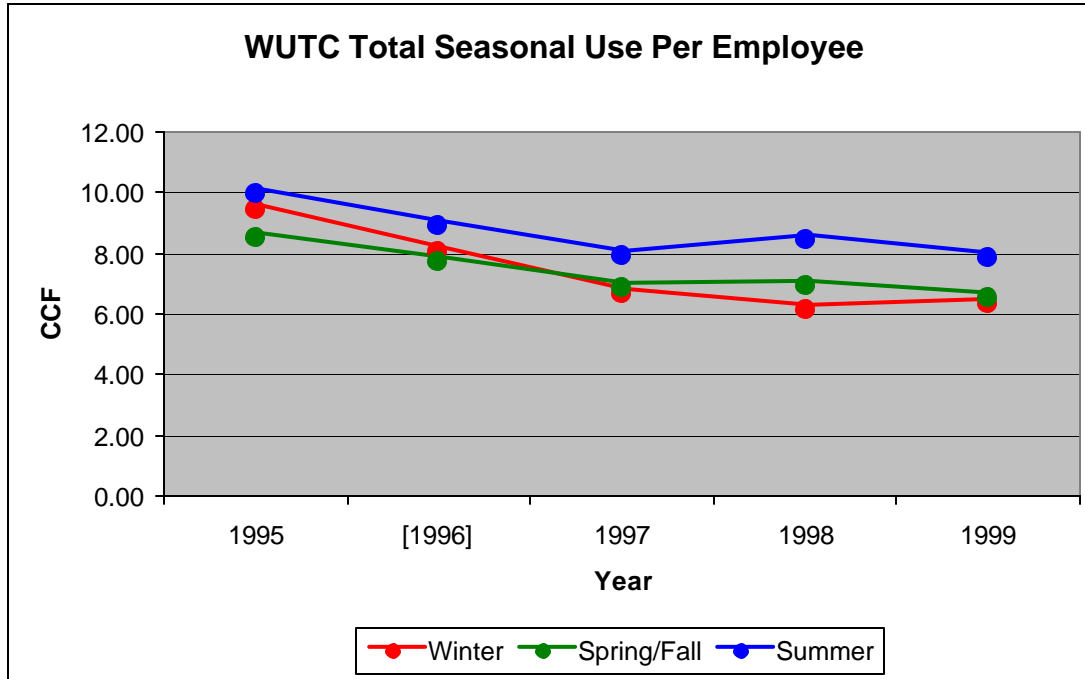
As seen in Figure 26, the total seasonal curves do not reflect large discrepancies in seasonal water use. Summer is the highest use and in 1997 spring/fall water use surpassed winter water use. Within some Grouped tracts, water use is as little as 2-4 CCF/season. These are some of the lowest rates in the entire study. Among the lowest consumers, Census A, B, E, G, H, I and K perform under 5 CCF/season per employee (Appendix I: Graph I1, I2, I5, I6-I8, I11). Similar to the total average curves are Census C, I and K (Appendix I: Graph I3, I9, I10). Each of these tracts has close seasonal curves. Census C has downward sloping curves whereas Census I and K have upward sloping curves.

Census A, E, H and J have similar trend lines that follow each other, but have noticeable seasonal variation (Appendix I: Graph I1, I5, I8, I10). In Census A and E there is a significant difference in summer use over spring/fall and winter from 1995 to 1997. From 1997 until 1999 the curves begin to stabilize and parallel each other, suggesting the smaller seasonal differences. Census H and J peak in 1997 and 1998, respectively and have a gradual decline in water use.

The most sporadic performing WUTC seasonal trends are Census B, D, F and G. These lines do not follow a trend or the seasonal assumptions of summer usually are higher water use. After 1997, Census B has no trends and summer's curve falls below spring/fall and winter curves. Spring/fall experiences a high increase during 1998 and then drops in 1999 (Appendix I: Graph I2). In 1998, Census D's summer curve breaks the previously close trend lines and rises 4 CCF above 1997 (Appendix I: Graph I4). Census G is the complete opposite of Census D's summer use (Appendix I: Graph I6). Census G is much higher than the other seasons until 1997 when it drastically reduces to join the spring/fall and winter trends. Census F is the most inconsistent with seasonal

assumptions and trends (Appendix I: Graph I6). Until 1997, the winter curve was performing above summer and spring/fall curves. After 1997, it joins the spring/fall and summer trend lines.

Figure 26: Total Seasonal Use Per Employee



In general, WUTC is inconsistent and even has some outliers from seasonal assumptions. Among some of the Grouped Census tracts, there is the lowest consuming per employees. Number of employees does not relate to water use. Because of the nature of the WUTC category, it is difficult to forecast into the future. The data does suggest that the Puget Sound ports do have an impact on water use.

Residential Comparison

In comparing single family with multi family water use, the single-family sector uses higher levels of water. The largest contribution to the difference is the indoor and outdoor water use. Multi family dwellings use less water because they rarely have outdoor uses, such as landscaping, which is one of the defining factors of single-family dwellings. Within indoor use, multi families usually use less water depending on home appliances; whereas single-family dwellings often have contain multiple home appliances. The graphs depicting total single and multi family use (Figure 6 & 9) has much different trends and crossover. Single family follows trends and do not fluctuate quite as much as multi family. In multi family, the overall tracts crossover and change significantly each year.

Multi family use is only slightly lower than single family. Presumably, this is due to the extra outdoor use by single family, whereas multi family often has minimal or no

outdoor use. In looking at Multi family annual totals (Figure 9), the range of water use is from 25 CCF/year to 40 CCF/year. The mean is about 32 CCF/year. For single family annual totals (Figure 6), the range of water use is from 22 CCF/year to 43 CCF/year. The mean for single family is about 34 CCF/year. Essentially, single family uses on average 2 CCFs/year less than multi family per person.

Commercial Comparison

Within the commercial sectors, water use per employee is more stratified. Depending on the basic characteristics of each sector, water use can be predicted to be higher or lower against other sectors. By far, manufacturing uses the most amount of water. Overall, all of the sectors Grouped Census tracts, except manufacturing, consume less than 100 CCF/year. Retail Grouped Census tracts used less than residential sectors. Retail is the least water intensive sector. In terms of population, there are few examples where a high number of commercial businesses in a certain Grouped Census tract also correlate to higher water use per capita. Population of employees is noticeably higher for certain sectors for each Grouped Census tract, but it does not relate to higher or lower water use.

Government/education and Retail are consistent in water use when compared by Grouped Census (Figure 12 & 18) Aside from one outlier Census in both categories, Government/education and retail each use less than 100 CCF/year and 30 CCF/year, respectively. Characteristically, government/education and retail fluctuate the least over time and within Grouped tracts because of the stability in number of employees. Each of these sectors mainly have indoor water needs. Government/education does have outdoor landscaping water needs, but that additional water is accounted in the varied amount per employee. There is between 100 CCF/year down to 30 CCF/year for government/education and retail, respectively. The less fluctuating over time and within Grouped tracts makes it easier to track. It also creates easy in assessing specific conservation measures.

Manufacturing, Service and WUTC are sporadic. Manufacturing is the most sporadic (Figure 15). Concentrated in a few high water use Grouped Census tracts, manufacturing has a few outliers. Within the low users, there is significantly less use, about 125 CCF/year compared to 1000 CCF/year among the outliers. The population has little effect on the water consumption, indicating manufacturing is related to the type of manufacturing. Some manufacturing is highly water intensive, whereas others are not so high.

Service and WUTC are not quite as sporadic as manufacturing. The curves of these sectors are spread evenly throughout the graph (Figure 21 & 24). Service ranges from 20 CCF/year to 70 CCF/year. WUTC ranges from 2 CCF/year to 64 CCF/year. Typically, service and WUTC have similar water use over time, but these sectors encompass broad definitions for businesses; therefore causing different levels of water use. In WUTC, there is a trend downward whereas service is consistent, but just curves spread depending on Grouped Census tract.

Comparisons between commercial sectors are difficult because the characteristics of each category determine water use. The overall observations are that seasonal use does not have as much of an impact as in residential. Although commercial sectors are subject to seasonal rates, most sectors do not reduce use, to save money. Often regardless of the season, water use stays the same throughout.

The major limiting factors for this research are the databases, especially from PSRC. Of course it can be assumed no data is perfect, but the more comprehensive a database is the easier it is to aggregate information. The simple nature of this project lends itself to easy calculations and mathematics, but the complexity of databases to yield the necessary raw data was the most challenging. Of the various databases used, WaterBIRD was the most complete and accurate. The US Census data from PSRC was fairly accurate in population estimates for single and multi family homes. Obviously the years in between Census collection dates are estimated from demolition and new housing in the city. The employment data was the most insufficient. PSRC has difficulty in obtaining industry information and with the new business GeoCoding in 1995, even greater errors occurred. Missing data is the largest problem with PSRC data.

Using the average totals of each category sector and Grouped Census tract as the sole means to assess high, middle and low-level water use is not necessarily the most accurate measurement method. For purposes of this study, the average of the total tracts and sectors were used to gauge excessive water use. The mean does not necessarily represent the ideal middle range water use by customers and therefore forcing those above the mean to conserve. In actuality, the mean can be above or below the ideal amount.

In all tables and raw data from WaterBIRD, 1992 was not a completely valid year to use in observing trends. Because WaterBIRD was first installed in 1991, a few glitches in data gathering and recording were present in 1992. It is obvious in the data trend lines for seasonal use, in any given graph, that summer, spring/fall and winter do not all have such similar use. This was most apparent in residential water use. Single family and multi family have the most sensitive seasonal use, yet their seasonal trends did not reflect different consumption amounts.

Employment is a narrow indicator for water use. Employment among the five category sectors is a broad parameter to measure each specific industry and the various consumption levels. For example, a highly water intensive manufacturing company may employ only a few workers, whereas a entirely different manufacturing company may have many employees but use very little water. Water use comparisons within sectors and against other sectors would be dependant on similar number of employees. Also, there are some anomalies where a technology change increases water use and decreases employees.

The inconsistency with PSRC employment data creates validity issues. GeoCoding was first used installed in 1995 and each preceding year the database has become more accurate in measuring and recording industries. The challenge in using such data is the inaccuracy with early years is not corrected and the assumption those future years will be recorded with accuracy. Little attention is being spent on improving

early data. PSRC did not even take measurements and records for 1996 because there were not enough human resources to manage the task.

As a result of the inconsistencies, missing data for certain years was a problem. To account for the gaps in data, this study used the average and the trends lines drawn straight through. 1996 is completely missing from all employment data. For Government/Education, it is also missing 1997. Using the average amount of water between two years is merely a placeholder and to maintain a continuous curve, but it is not an accurate measurement. It should be treated only as an average and not an actual amount of water per employee for those missing year(s).

In general the data and the behavior of sectors or tracts cannot be explained without further research; it is merely based on basic characteristics within each Grouped Census tract. From those assumptions and projections, there are suggested reasons to explain anomalies and abnormalities in the findings. These suggestions only propose theoretical answers to the questions raised by the study, but further research would be necessary to conclude the suggestions.

The implications of this research are crucial to improved management of water use with a growing population, particularly because the research innovative and new. Measuring per capita/per employee accounts for an increasing population. The parameters of seasonal, annual and Grouped Census tracts enable this project to be a quick reference of facts. In the future, the additional years of data will keep this project updated. Without target water use per capita, the research serves only as per capita data, but by setting benchmarks specific efforts can be employed to encourage specific sectors to use less water.

The category sectors are broad enough to evaluate differences in water use based on industry characteristics, but the data found is limited by the few categories. The data is useful for its intended purpose of finding per employee water use, but more categories based on SIC codes would improve assessing high water use in specific industrial sectors. Breaking the 1990 US Census tracts into 11 Grouped Census tracts made it easier to evaluate water use by location. From this information, specific recommendations can be made based on areas and industry sector with high water use. The use of category sectors and the 11 Grouped Census tracts does allow for simplicity without larger categories and more tracts; therefore making it easier to tract the project. This makes dissemination of information and analysis easier.

Overall trends observed are seasonal use is highest among residential and merely noticeable in the commercial sector. Within the commercial sectors, manufacturing has extremely high use. Among the other four sectors (retail, government/education, service and WUTC), there are more manageable water use trends. Looking at how population related to water user per capita, it is most significant in residential households. In commercial sectors, the significance is greatly dependant on the industrial characteristics and water needs.

In terms of changing water consumption patterns, there are specific areas based on sector, season and tracts that have never been implemented or monitored prior to this research. With this information, efforts can target certain areas to conserve water. The database will make unique enhancements in tract improvements and effects of water conservation programs.

The project allows SPU, the public and legislators to evaluate performance by a number of factors instead of an overall amount of water used per person. The per capita data can be used to encourage, bill or force tracts or categories to conserve water, especially during seasonally sensitive times. This give a degree of personal responsibility to certain communities and sectors on the importance of conserving water, especially when compared to other sectors. For SPU, the City Council and the community, this can be used as a future model for other natural resources and waste monitoring.

Setting benchmarks for each sector to conserve water will streamline the process of assessing high water use. This study used the mean averages as the medium level water users, but the mean may be a target set too high or low. To obtain targets for future research, the mean can be used as the initial benchmark. New benchmarks should be assessed to see how effective the mean was at predicting water use annually. Additional research is needed to assess reliable benchmarks. Specifically, the benchmarks will be most effective in residential water use categories. Single family and multi family are stable and contain specific housing codes whereas the commercial sectors are comprised of many SIC codes. Industries vary depending on the business characteristics and employment numbers. Lumping similar industries is difficult to assess specific water use measures, nonetheless, benchmarks for each category sector set forth in this research will enable SPU, industries and the public to assess water use.

Validating the assumptions and suggestions requires further research. The assumptions are based on past SPU research and water consumption behavior by each sector. The suggestions about the data results are partially based on characteristics of Seattle, employment numbers and seasonal use. The suggestions are mere suggestions and do not imply concrete evidence. Further research should be conducted to validate the suggestions.

Using 1992 WaterBIRD data skewed some results. 1992 was the full year after the induction of WaterBIRD as the record-keeping program. There are many flaws related to the data recorded in 1992 because it was a drought year and full restrictions on landscape watering were prohibited throughout the summer. This applies to single and multi family homes because employment data is not available in valid TAZ form prior to 1995. Most of the data shows similar seasonal water use yet it was a drought year, therefore it should have produced higher summer per capita points. Dropping 1992 from future data would avoid skewing the results and curves are the best solution. Besides, with future years added to the project, it will evaluation of past data more accurate. Also, future data will create more years of analysis and dropping 1992 could make the project equally as valid.

For the commercial sector, employment data is the easiest data to correlate with per capita, but it also has quite inconsistencies. There are only five sectors to evaluate all commercial sectors. Many sectors contain various number of employees. For the purpose of this research the study simplified the sectors, but to have more accurate measures, more specific commercial sectors should be used. Less SIC codes per category would improve per employee results.

The Grouped Census tracts have been created for purpose of this research, but presenting it to neighborhood groups and community development organizations for insight will improve the delineation of tracts. By receiving recommendations and

criticism from Seattle communities, it will allow this project to gain important insight but also promote awareness of water consumption. Participation in the planning stages of the Grouped Census tracts by the community will encourage them to be involved in the conservation efforts specific to their area.

With this information, disseminating and raising public awareness is necessary. To encourage water conservation, it is necessary to educate the public on how much water an average person uses. Using this research, the numbers indicate the amount of water seasonally, annually and within smaller tracts. If this information were to be regularly monitored and disseminated, then the community will be educated and eventually help accountable for conservation.

To publicize per capita/per employee water use, the SPU website should give seasonal and annual updates. With the Grouped Census tract map, a click of the interested tract will produce per capita/per employee amounts. Also, public service announcements in newspapers and public radio can specifically mention the areas with high use. SPU can insert a quick reference Seattle map to give an overview of performance in local papers, in-house newsletters and state legislation material.

Appendix A: Puget Sound Regional Council Category Code

ID	PSRC	CATEGORYCODE
1	Gov't/Educ	ARMSV
2	Service	CHARI
3	Service	CHRCH
4	Retail	COMBO
5	Retail	COMMI
6	Gov't/Educ	CONTY
7	Gov't/Educ	FEDRL
8	Service	GCOML
9	Manufacturing	HVMFG
10	Service	LDRMT
11	Service	LNDRY
12	Retail	LOCAL
13	Manufacturing	LTMFG
14	Retail	LUMBR
15	Retail	MCOML
16	Retail	METBU
17	Gov't/Educ	MUNI
18	Service	NEIGH
19	Gov't/Educ	PARKS
20	WUTC	PORT
21	Gov't/Educ	SCHLS
22	Gov't/Educ	STATE
23	Manufacturing	STONE
24	Service	TLODG
25	WUTC	TRANS
26	WUTC	TRNEQ
27	Gov't/Educ	UNIV
28	Service	UNKWN
29	WUTC	UTIL
30	Residential	APART
31	Residential	BDHSE
32	Residential	DPLEX
33	Residential	HSEBT
34	Residential	SFMLY

APPENDIX B: Grouped Tracts Converted from 1990 Census Tracts

GROUPTRACT	CT1990	GROUPTRACT	CT1990
A	3	G	62
A	4	G	63
A	5	G	64
A	6	G	65
A	13	G	74
A	14	G	75
A	15	G	76
A	16	G	77
A	17	G	78
A	18	G	79
A	19	G	88
B	1	H	72
B	2	H	73
B	7	H	80
B	8	H	81
B	9	H	82
B	10	H	83
B	11	H	84
B	12	H	85
B	20	H	86
B	21	H	87
B	22	I	89
C	28	I	90
C	29	I	91
C	30	I	92
C	31	I	93
C	32	I	94
C	33	I	95
C	34	I	100
C	35	I	101
C	47	I	102
C	48	I	103
C	49	J	96
D	26	J	97
D	27	J	98
D	36	J	99
D	45	J	105
D	46	J	106
D	50	J	107
D	51	J	115
D	52	J	116
D	54	J	120
D	61	J	121
D	66	K	104
E	23.98	K	108
E	24	K	109
E	25	K	110
E	37	K	111
E	38	K	112
E	39	K	113
E	41	K	114
E	42	K	117
E	43	K	118
E	44	K	119
E	53.01		
E	53.02		
F	55		
F	56		
F	57		
F	58.01		
F	58.02		
F	59		
F	60		
F	67.98		
F	68.98		
F	69		
F	70		
F	71		

Appendix C: Single Family Totals and Grouped Census

Table C1: Single Family Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	1,409,927.18	2,130,750.11	4,414,171.76	7,954,849.04					
1992	3,212,731.66	3,362,879.09	3,511,822.19	10,087,432.93	324,925.00	9.89	10.35	10.81	31.05
1993	3,048,289.92	3,508,799.28	4,235,719.87	10,792,809.06	324,007.00	9.41	10.83	13.07	33.31
1994	3,090,421.36	3,663,716.21	5,151,321.88	11,905,459.45	331,459.00	9.32	11.05	15.54	35.92
1995	3,063,857.46	3,536,419.49	5,041,232.05	11,641,508.99	331,908.00	9.23	10.65	15.19	35.07
1996	3,121,148.84	3,420,185.60	4,772,544.39	11,313,878.84	331,204.00	9.42	10.33	14.41	34.16
1997	3,205,903.90	3,467,655.74	4,417,822.00	11,091,381.64	331,394.00	9.67	10.46	13.33	33.47
1998	3,150,272.37	3,604,030.92	4,777,003.32	11,531,306.61	332,472.00	9.48	10.84	14.37	34.68
1999	3,132,300.98	3,494,137.25	4,358,173.65	10,984,611.88	331,474.00	9.45	10.54	13.15	33.14
2000	2,422,404.78	3,384,879.16	4,763,161.95	10,570,445.88					

Table C2: Single Family Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	155,348.62	221,039.45	434,467.72	810,855.80					
1992	332,242.13	354,967.42	376,023.88	1,063,233.44	34,520.00	9.62	10.28	10.89	30.80
1993	326,157.41	372,938.35	447,881.87	1,146,977.62	34,362.00	9.49	10.85	13.03	33.38
1994	328,097.72	385,045.26	582,103.38	1,295,246.36	35,095.00	9.35	10.97	16.59	36.91
1995	330,944.26	376,399.07	553,004.16	1,260,347.49	35,153.00	9.41	10.71	15.73	35.85
1996	327,388.18	359,673.00	527,466.47	1,214,527.65	35,222.00	9.29	10.21	14.98	34.48
1997	349,092.11	357,956.80	488,330.59	1,195,379.50	35,236.00	9.91	10.16	13.86	33.92
1998	335,385.33	384,135.86	516,028.85	1,235,550.04	35,351.00	9.49	10.87	14.60	34.95
1999	329,121.87	371,267.01	458,407.39	1,158,796.26	35,217.00	9.35	10.54	13.02	32.90
2000	232,650.36	342,304.79	513,347.81	1,088,302.96					

Graph C1: Single Family Census A

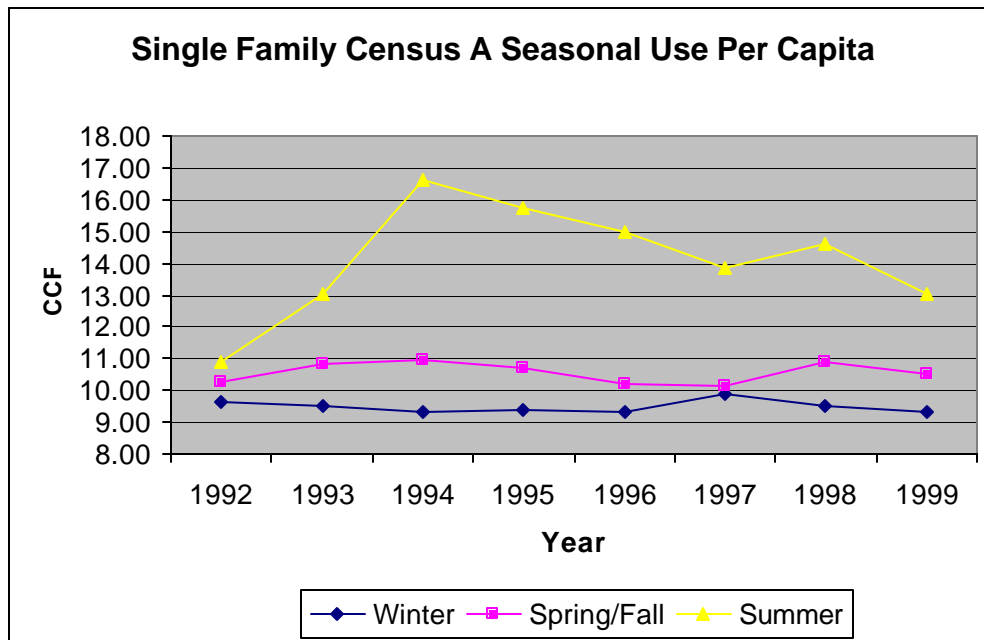


Table C3: Single Family Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Per Capita/Per Season	Winter	Spring/Fall	Summer	Total Per Capita
1991	129,491.09	198,818.32	399,166.41	727,475.81						
1992	288,194.19	299,397.34	314,936.35	902,527.89	28,896.00	9.97	10.36	10.90	31.23	
1993	276,979.60	314,777.30	369,732.17	961,489.06	28,817.00	9.61	10.92	12.83	33.37	
1994	277,947.48	319,482.84	474,394.56	1,071,824.88	29,417.00	9.45	10.86	16.13	36.44	
1995	276,787.62	312,063.90	449,543.95	1,038,395.48	29,440.00	9.40	10.60	15.27	35.27	
1996	283,005.82	307,255.92	429,733.60	1,019,995.34	29,528.00	9.58	10.41	14.55	34.54	
1997	288,955.44	304,530.02	403,116.60	996,602.05	29,545.00	9.78	10.31	13.64	33.73	
1998	288,995.16	320,953.06	432,344.79	1,042,293.00	29,604.00	9.76	10.84	14.60	35.21	
1999	284,956.91	311,419.33	383,938.22	980,314.46	29,512.00	9.66	10.55	13.01	33.22	
2000	183,170.03	302,365.16	431,628.54	917,163.72						

Graph C2: Single Family Census B

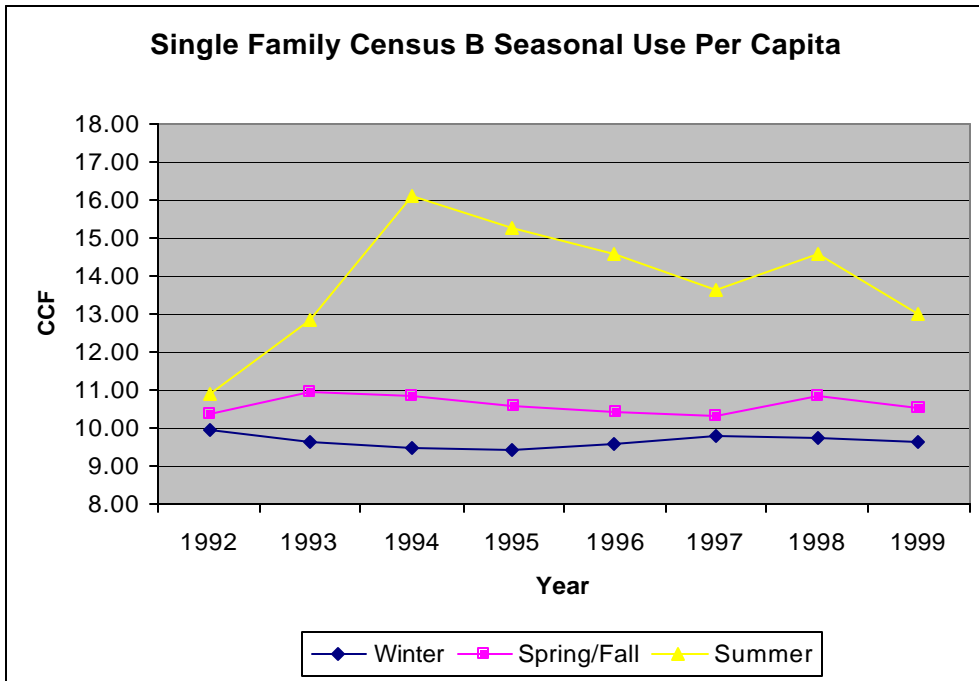


Table C4: Single Family Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	142,495.08	212,190.82	457,553.89	812,239.79					
1992	338,024.71	344,923.88	349,699.73	1,032,648.31	35,238.00	9.59	9.79	9.92	29.30
1993	312,063.87	359,665.23	410,826.60	1,082,555.70	35,016.00	8.91	10.27	11.73	30.92
1994	317,310.33	377,601.39	495,377.69	1,190,289.42	35,869.00	8.85	10.53	13.81	33.18
1995	316,626.99	362,751.06	488,209.05	1,167,587.10	35,850.00	8.83	10.12	13.62	32.57
1996	328,329.67	353,527.58	461,699.70	1,143,556.95	35,777.00	9.18	9.88	12.90	31.96
1997	329,239.96	366,352.96	419,440.38	1,115,033.29	35,768.00	9.20	10.24	11.73	31.17
1998	322,475.85	366,092.12	454,706.18	1,143,274.16	35,862.00	8.99	10.21	12.68	31.88
1999	323,924.62	359,067.88	415,966.82	1,098,959.32	35,659.00	9.08	10.07	11.67	30.82
2000	266,212.59	348,659.61	457,883.36	1,072,755.56					

Graph C3: Single Family Census C

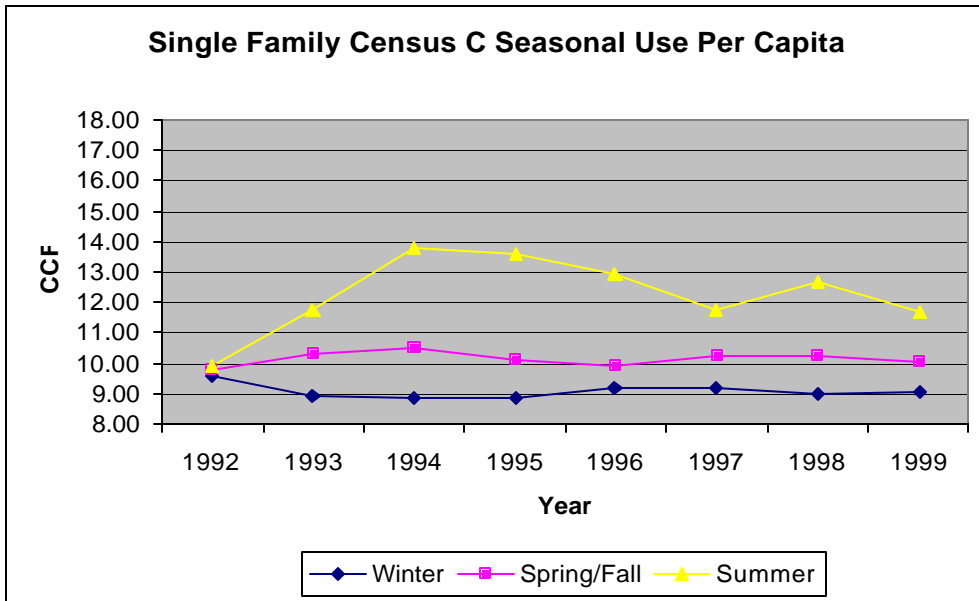


Table C4: Single Family Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	104,065.94	156,036.70	306,207.73	566,310.37					
1992	248,198.82	249,857.91	258,403.14	756,459.86	25,313.00	9.81	9.87	10.21	29.88
1993	232,098.10	259,627.46	299,060.01	790,785.57	25,189.00	9.21	10.31	11.87	31.39
1994	239,295.26	274,462.99	358,223.09	871,981.34	25,770.00	9.29	10.65	13.90	33.84
1995	237,888.52	265,552.81	348,868.50	852,309.83	25,950.00	9.17	10.23	13.44	32.84
1996	241,734.56	262,361.80	334,981.65	839,078.01	25,669.00	9.42	10.22	13.05	32.69
1997	243,236.40	264,354.25	311,737.17	819,327.82	25,660.00	9.48	10.30	12.15	31.93
1998	240,518.20	269,619.66	330,561.14	840,699.00	25,722.00	9.35	10.48	12.85	32.68
1999	235,504.89	260,738.41	303,591.33	799,834.63	25,577.00	9.21	10.19	11.87	31.27
2000	202,593.55	253,495.31	328,244.64	784,333.50					

Graph C3: Single Family Census D

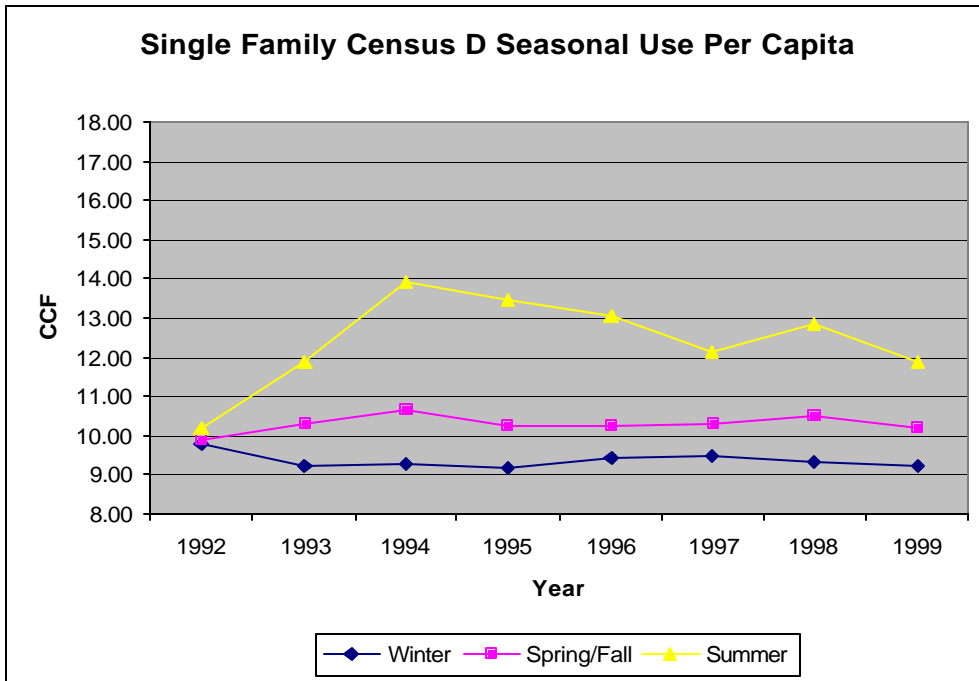


Table C5: Single Family Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	113,872.74	190,869.76	387,131.89	691,874.39					
1992	264,734.54	278,637.10	308,148.78	851,520.42	25,785.00	10.27	10.81	11.95	33.02
1993	253,534.36	304,076.16	379,404.08	937,014.60	25,619.00	9.90	11.87	14.81	36.57
1994	260,812.85	323,904.12	470,187.03	1,054,904.00	26,235.00	9.94	12.35	17.92	40.21
1995	255,524.91	314,274.95	458,936.00	1,028,735.86	26,167.00	9.77	12.01	17.54	39.31
1996	252,610.84	303,955.73	442,796.70	999,363.27	26,148.00	9.66	11.62	16.93	38.22
1997	267,391.16	293,162.11	403,266.44	963,819.71	26,142.00	10.23	11.21	15.43	36.87
1998	259,040.04	317,259.63	438,888.21	1,015,187.88	26,193.00	9.89	12.11	16.76	38.76
1999	252,380.65	310,557.90	393,810.78	956,749.34	26,043.00	9.69	11.92	15.12	36.74
2000	233,506.62	296,923.81	441,473.02	971,903.46					

Graph C4: Single Family Census E

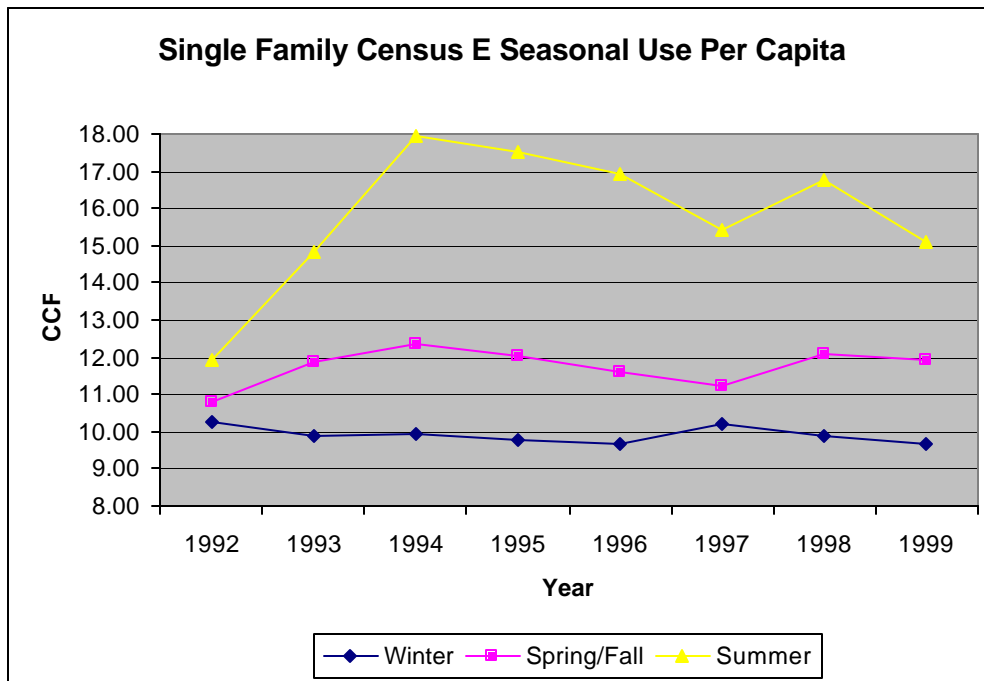


Table C6: Single Family Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	123,432.42	199,484.06	515,486.70	838,403.18					
1992	278,617.62	306,524.56	313,588.81	898,730.99	26,525.00	10.50	11.56	11.82	33.88
1993	258,220.24	322,757.99	439,439.75	1,020,417.98	26,433.00	9.77	12.21	16.62	38.60
1994	261,280.56	353,779.21	539,581.40	1,154,641.16	27,075.00	9.65	13.07	19.93	42.65
1995	253,380.13	323,805.96	553,935.56	1,131,121.65	27,175.00	9.32	11.92	20.38	41.62
1996	269,779.51	312,378.49	490,968.80	1,073,126.80	26,963.00	10.01	11.59	18.21	39.80
1997	274,710.11	326,822.33	441,824.98	1,043,357.43	26,964.00	10.19	12.12	16.39	38.69
1998	267,332.26	335,014.53	505,455.62	1,107,802.41	27,039.00	9.89	12.39	18.69	40.97
1999	270,644.80	314,762.92	462,647.05	1,048,054.78	26,925.00	10.05	11.69	17.18	38.92
2000	188,208.04	309,609.37	494,700.70	992,518.12					

Graph C5: Single Family Census F

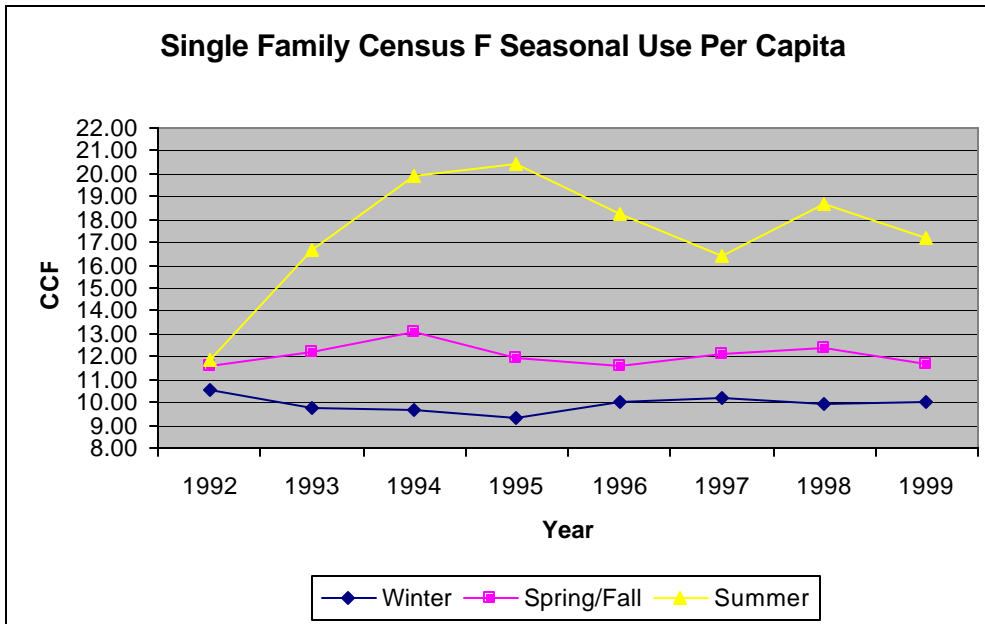


Table C7: Single Family Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	116,741.90	204,322.24	425,018.03	746,082.17					
1992	263,149.04	283,616.24	310,541.54	857,306.81	24,428.00	10.77	11.61	12.71	35.10
1993	243,297.78	288,318.99	374,724.83	906,341.59	24,489.00	9.93	11.77	15.30	37.01
1994	247,949.64	305,129.32	451,578.04	1,004,657.00	25,084.00	9.88	12.16	18.00	40.05
1995	244,772.94	284,583.01	453,046.77	982,402.72	25,204.00	9.71	11.29	17.98	38.98
1996	252,363.30	266,566.23	433,045.57	951,975.10	24,845.00	10.16	10.73	17.43	38.32
1997	250,537.05	271,599.03	405,254.38	927,390.47	24,855.00	10.08	10.93	16.30	37.31
1998	250,317.73	294,942.10	433,904.19	979,164.02	24,931.00	10.04	11.83	17.40	39.27
1999	253,585.41	287,819.59	399,380.19	940,785.19	24,837.00	10.21	11.59	16.08	37.88
2000	146,098.40	278,312.78	437,909.90	862,321.08					

Graph C6: Single Family Census G

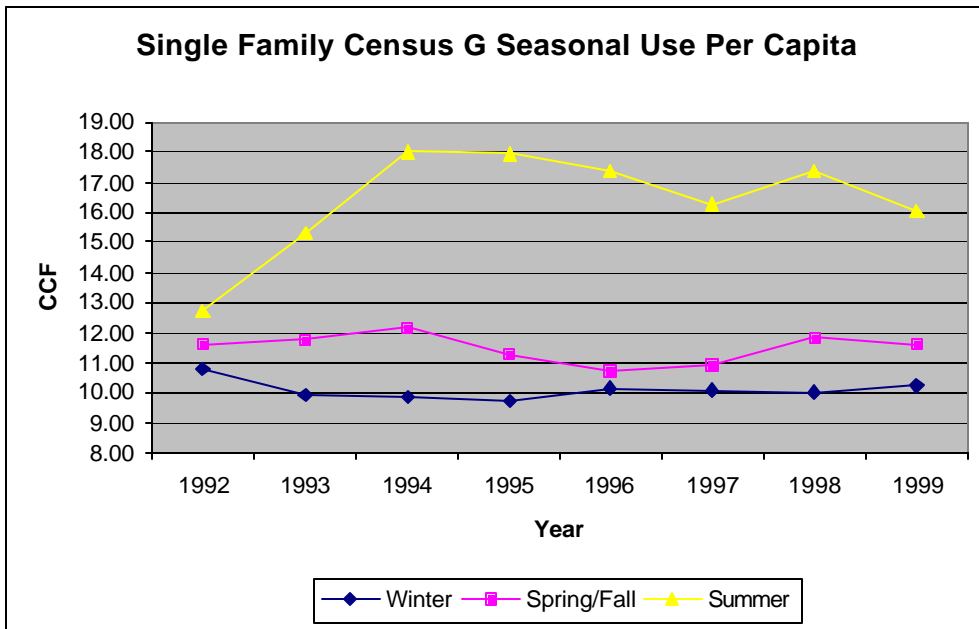


Table C8: Single Family Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Per Capita/Per Season	Winter	Spring/Fall	Summer	Total Per Capita
1991	9,820.50	9,341.94	16,449.02	35,611.46						
1992	19,659.72	20,006.26	20,375.41	60,041.39	2,601.00	7.56	7.69	7.83	23.08	
1993	18,380.51	20,067.74	21,837.16	60,285.42	2,642.00	6.96	7.60	8.27	22.82	
1994	19,941.90	20,201.95	25,263.77	65,407.61	2,672.00	7.46	7.56	9.46	24.48	
1995	18,799.34	19,028.85	23,791.49	61,619.68	2,807.00	6.70	6.78	8.48	21.95	
1996	18,872.46	20,007.34	24,873.90	63,753.69	2,649.00	7.12	7.55	9.39	24.07	
1997	20,607.63	20,108.09	24,513.75	65,229.47	2,659.00	7.75	7.56	9.22	24.53	
1998	21,040.14	20,949.62	24,601.88	66,591.64	2,686.00	7.83	7.80	9.16	24.79	
1999	19,814.85	20,037.62	23,606.84	63,459.31	2,724.00	7.27	7.36	8.67	23.30	
2000	11,480.57	19,244.51	24,558.30	55,283.37						

Graph C8: Single Family Census H

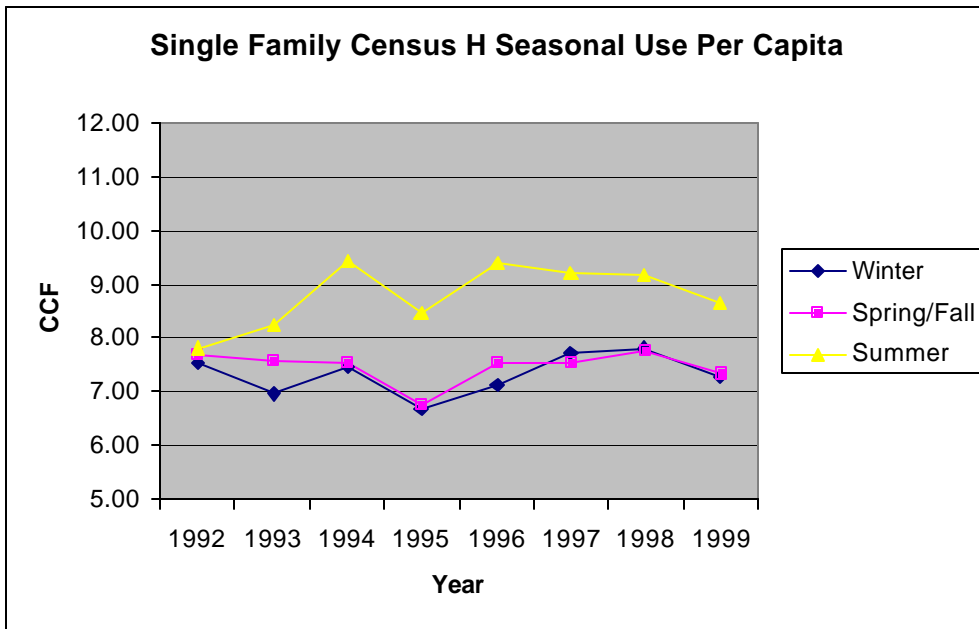


Table C9: Single Family Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
					Per Capita/Per Season				
1991	121,354.94	177,766.83	317,082.79	616,204.57					
1992	285,009.11	290,773.41	303,529.79	879,312.32	28,641.00	9.95	10.15	10.60	30.70
1993	275,728.97	297,637.83	343,374.74	916,741.54	28,587.00	9.65	10.41	12.01	32.07
1994	276,309.32	305,139.02	393,238.92	974,687.26	29,324.00	9.42	10.41	13.41	33.24
1995	270,785.32	294,688.26	379,818.30	945,291.88	29,318.00	9.24	10.05	12.96	32.24
1996	269,489.02	293,751.37	361,944.70	925,185.10	29,279.00	9.20	10.03	12.36	31.60
1997	284,625.97	297,171.51	354,144.00	935,941.47	29,346.00	9.70	10.13	12.07	31.89
1998	276,458.81	301,386.48	367,531.26	945,376.55	29,498.00	9.37	10.22	12.46	32.05
1999	272,543.29	299,366.45	343,235.62	915,145.35	29,506.00	9.24	10.15	11.63	31.02
2000	250,204.97	292,676.31	372,918.62	915,799.90					

Graph C8: Single Family Census I

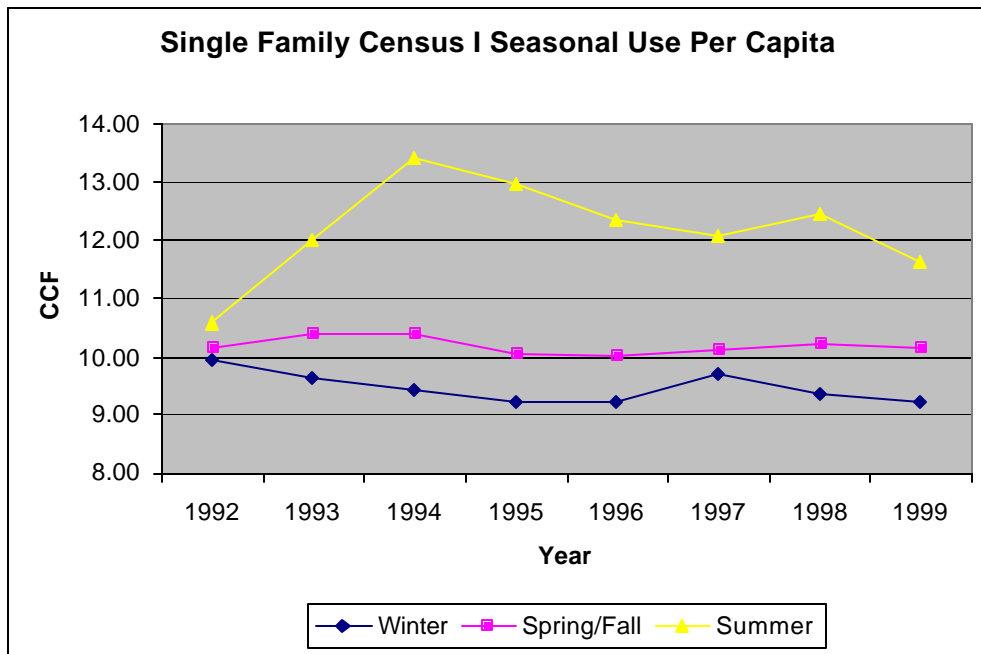


Table C10: Single Family Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	190,448.50	286,631.60	655,715.24	1,132,795.34					
1992	441,480.85	461,424.65	476,353.57	1,379,259.06	44,702.00	9.88	10.32	10.66	30.85
1993	411,364.76	489,338.46	604,092.38	1,504,795.60	44,532.00	9.24	10.99	13.57	33.79
1994	409,489.13	510,668.07	738,058.20	1,658,215.40	45,524.00	9.00	11.22	16.21	36.43
1995	408,348.89	491,857.14	725,964.65	1,626,170.68	45,541.00	8.97	10.80	15.94	35.71
1996	422,638.88	464,432.21	675,925.63	1,562,996.72	45,583.00	9.27	10.19	14.83	34.29
1997	427,194.20	484,607.26	600,069.74	1,511,871.20	45,594.00	9.37	10.63	13.16	33.16
1998	424,571.45	496,226.59	677,516.53	1,598,314.57	45,738.00	9.28	10.85	14.81	34.95
1999	426,302.74	470,393.10	619,427.22	1,516,123.06	45,590.00	9.35	10.32	13.59	33.26
2000	326,716.32	465,170.33	665,798.67	1,457,685.32					

Graph C9: Single Family Census J

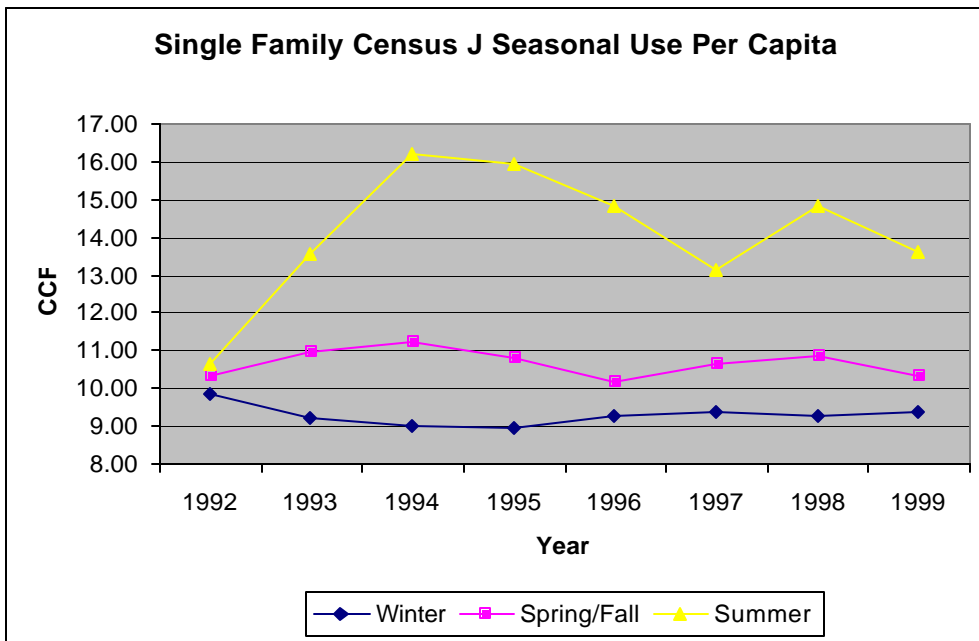
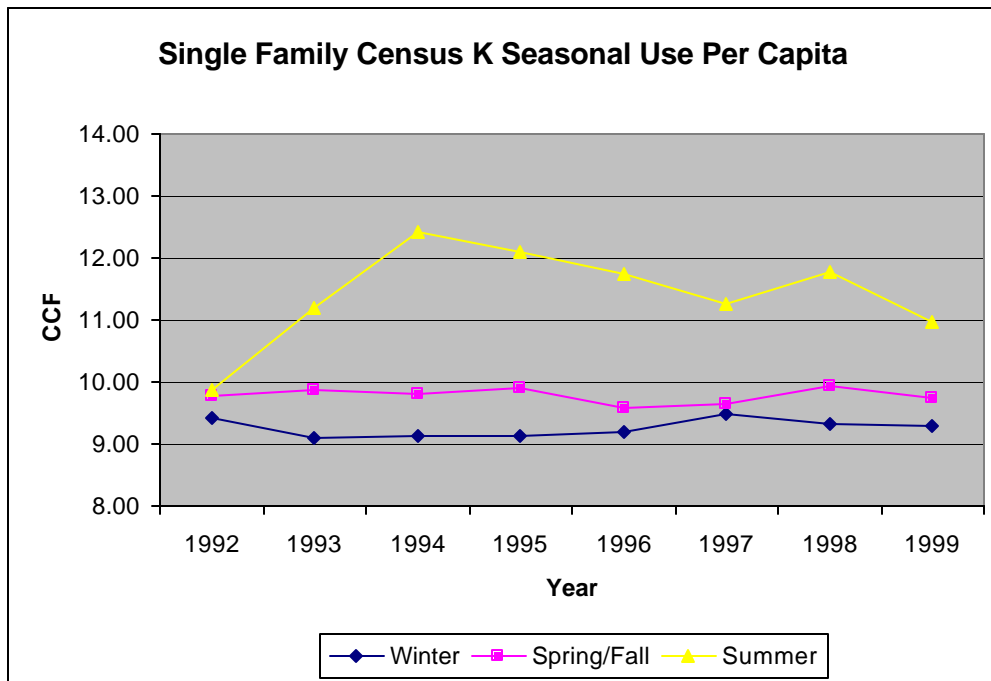


Table C11: Single Family Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	197,157.90	264,141.89	478,911.65	940,211.44					
1992	441,556.56	458,604.36	463,715.46	1,363,876.38	46,929.00	9.41	9.77	9.88	29.06
1993	428,135.94	463,603.23	525,249.95	1,416,989.12	46,983.00	9.11	9.87	11.18	30.16
1994	439,033.55	471,040.79	596,563.89	1,506,638.23	48,028.00	9.14	9.81	12.42	31.37
1995	437,367.51	475,131.77	580,276.01	1,492,775.29	47,936.00	9.12	9.91	12.11	31.14
1996	442,374.34	461,455.71	565,048.10	1,468,878.16	48,169.00	9.18	9.58	11.73	30.49
1997	457,405.64	465,179.05	543,343.54	1,465,928.24	48,255.00	9.48	9.64	11.26	30.38
1998	451,260.35	480,985.28	570,942.34	1,503,187.96	48,477.00	9.31	9.92	11.78	31.01
1999	451,202.38	472,768.40	532,876.47	1,456,847.25	48,518.00	9.30	9.74	10.98	30.03
2000	369,350.87	460,262.73	570,711.80	1,400,325.40					

Graph C10: Single Family Census K



Appendix D: Multi Family Totals and Grouped Census

Table D1: Multi Family Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	803,810.81	932,399.46	1,553,299.23	3,289,509.50					
1992	1,841,436.16	1,909,471.16	1,835,264.41	5,586,171.72	175,090.00	10.52	10.91	10.48	31.90
1993	1,813,851.42	1,916,692.50	2,009,113.45	5,739,657.37	181,829.00	9.98	10.54	11.05	31.57
1994	1,840,429.31	1,923,736.04	2,052,069.17	5,816,234.52	178,252.00	10.32	10.79	11.51	32.63
1995	1,833,651.35	1,935,409.66	2,102,327.88	5,871,388.90	179,722.00	10.20	10.77	11.70	32.67
1996	1,892,395.06	1,949,214.88	2,084,279.60	5,925,889.54	182,410.00	10.37	10.69	11.43	32.49
1997	1,932,830.46	1,958,366.48	2,057,393.24	5,948,590.18	183,722.00	10.52	10.66	11.20	32.38
1998	1,910,625.31	1,984,505.53	2,105,635.06	6,000,765.90	185,684.00	10.29	10.69	11.34	32.32
1999	1,905,691.22	1,936,464.11	2,052,537.51	5,894,692.84	187,303.00	10.17	10.34	10.96	31.47
2000	1,524,416.76	1,935,647.25	2,155,872.90	5,615,936.92					

Table D2: Multi Family Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	155,348.62	221,039.45	434,467.72	810,855.80					
1992	332,242.13	354,967.42	376,023.88	1,063,233.44	34,520.00	9.62	10.28	10.89	30.80
1993	326,157.41	372,938.35	447,881.87	1,146,977.62	34,362.00	9.49	10.85	13.03	33.38
1994	328,097.72	385,045.26	582,103.38	1,295,246.36	35,095.00	9.35	10.97	16.59	36.91
1995	330,944.26	376,399.07	553,004.16	1,260,347.49	35,153.00	9.41	10.71	15.73	35.85
1996	327,388.18	359,673.00	527,466.47	1,214,527.65	35,222.00	9.29	10.21	14.98	34.48
1997	349,092.11	357,956.80	488,330.59	1,195,379.50	35,236.00	9.91	10.16	13.86	33.92
1998	335,385.33	384,135.86	516,028.85	1,235,550.04	35,351.00	9.49	10.87	14.60	34.95
1999	329,121.87	371,267.01	458,407.39	1,158,796.26	35,217.00	9.35	10.54	13.02	32.90
2000	232,650.36	342,304.79	513,347.81	1,088,302.96					

Graph D1: Multi Family Census A

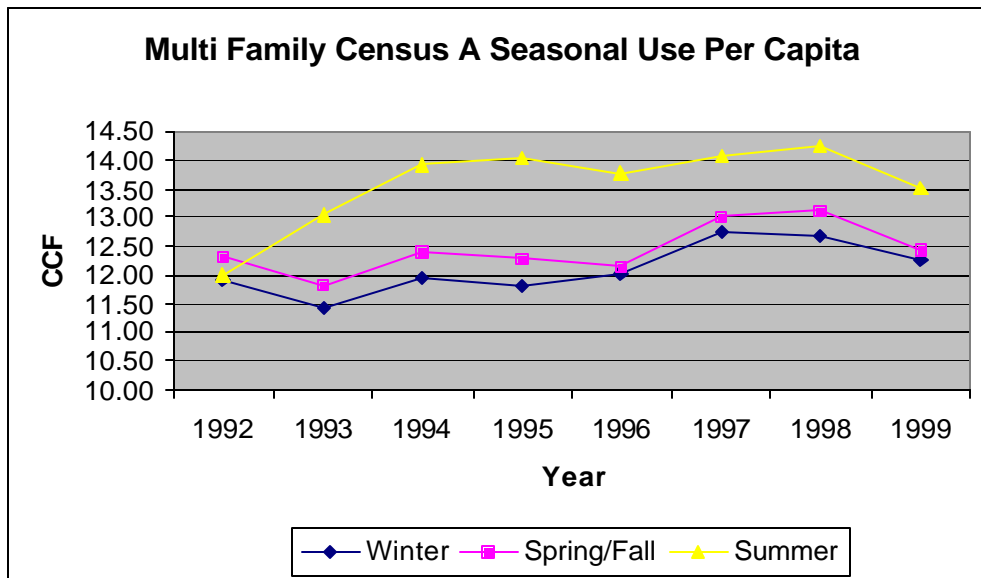


Table D3: Multi Family Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	60,985.79	74,185.20	119,043.80	254,214.78					
1992	137,628.53	146,620.89	140,391.20	424,640.61	11,618.00	11.85	12.62	12.08	36.55
1993	139,298.82	145,761.99	153,036.94	438,097.76	12,117.00	11.50	12.03	12.63	36.16
1994	132,443.48	138,080.39	146,572.61	417,096.48	11,936.00	11.10	11.57	12.28	34.94
1995	137,113.82	138,586.78	152,304.62	428,005.21	12,088.00	11.34	11.46	12.60	35.41
1996	141,563.17	141,805.75	153,170.15	436,539.07	12,516.00	11.31	11.33	12.24	34.88
1997	142,987.04	145,434.59	154,945.39	443,367.02	12,730.00	11.23	11.42	12.17	34.83
1998	146,979.38	151,290.57	159,764.52	458,034.48	13,023.00	11.29	11.62	12.27	35.17
1999	147,136.89	148,031.65	154,112.51	449,281.05	13,060.00	11.27	11.33	11.80	34.40
2000	112,539.84	144,252.66	161,149.10	417,941.60					

Graph D2: Multi Family Census B

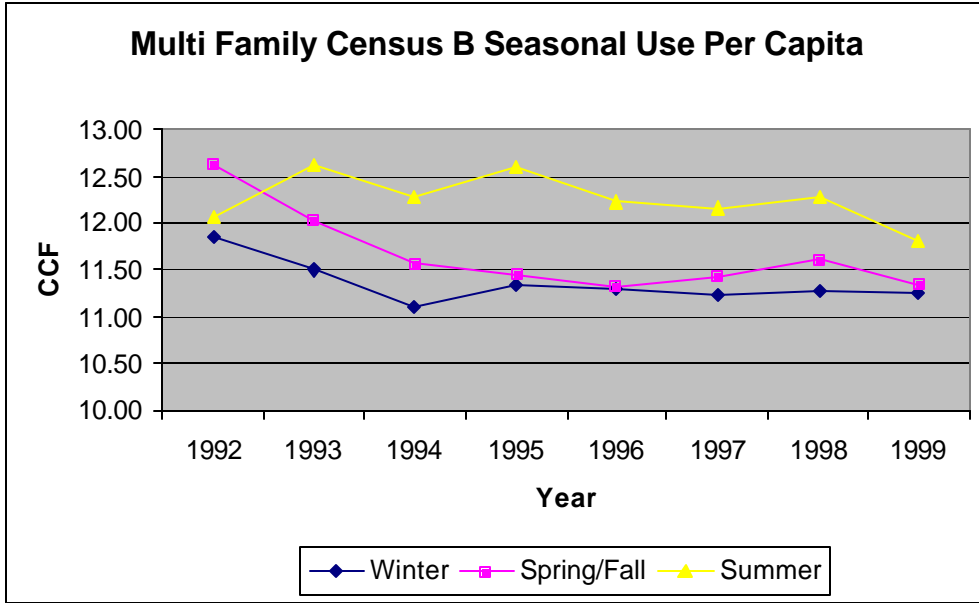


Table D4: Multi Family Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	67,323.53	78,497.00	136,246.25	282,066.78					
1992	151,901.84	156,350.54	150,482.76	458,735.14	16,505.00	9.20	9.47	9.12	27.79
1993	152,011.68	157,758.45	167,582.47	477,352.60	17,019.00	8.93	9.27	9.85	28.05
1994	149,120.28	157,820.39	172,082.60	479,023.26	16,801.00	8.88	9.39	10.24	28.51
1995	152,567.78	160,563.04	174,516.79	487,647.61	16,866.00	9.05	9.52	10.35	28.91
1996	157,217.65	158,150.62	169,668.51	485,036.78	16,945.00	9.28	9.33	10.01	28.62
1997	153,419.11	159,273.00	164,745.99	477,438.10	17,000.00	9.02	9.37	9.69	28.08
1998	153,543.86	159,374.06	166,420.88	479,338.80	17,033.00	9.01	9.36	9.77	28.14
1999	155,803.12	155,457.88	163,379.76	474,640.76	17,029.00	9.15	9.13	9.59	27.87
2000	122,457.46	154,256.37	167,469.34	444,183.17					

Graph D3: Multi Family Census C

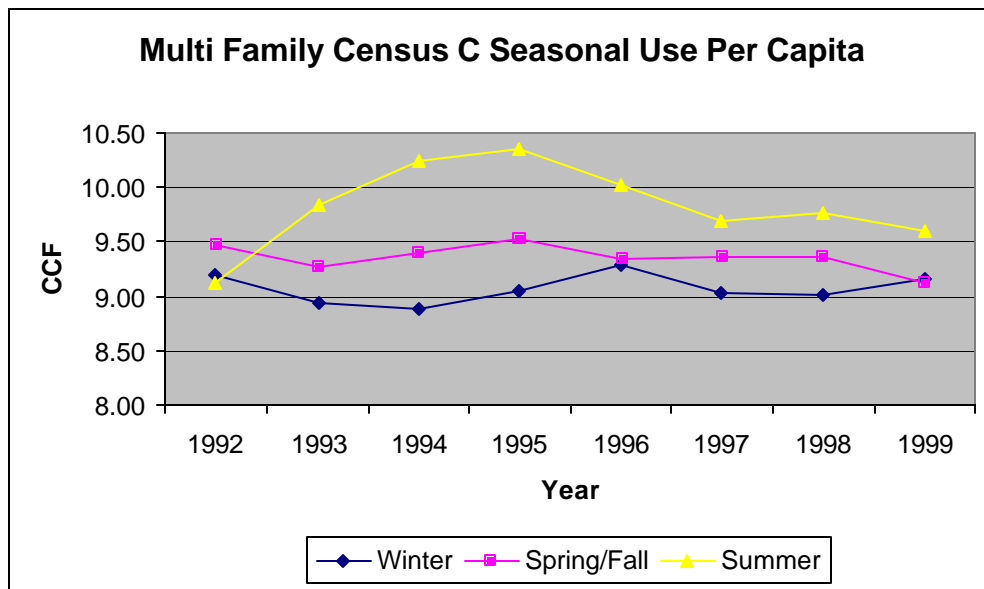


Table D5: Multi Family Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	59,078.01	74,077.60	127,695.70	260,851.31					
1992	139,924.78	142,407.40	136,417.24	418,749.42	15,087.00	9.27	9.44	9.04	27.76
1993	135,665.99	140,482.08	147,215.66	423,363.74	15,698.00	8.64	8.95	9.38	26.97
1994	137,365.72	145,063.05	153,862.83	436,291.60	15,340.00	8.95	9.46	10.03	28.44
1995	140,883.87	145,008.41	157,301.35	443,193.63	15,396.00	9.15	9.42	10.22	28.79
1996	143,184.73	147,390.52	154,231.13	444,806.38	15,703.00	9.12	9.39	9.82	28.33
1997	144,845.28	145,568.94	150,760.97	441,175.18	15,786.00	9.18	9.22	9.55	27.95
1998	143,663.37	145,687.41	155,127.74	444,478.52	15,867.00	9.05	9.18	9.78	28.01
1999	140,702.47	144,557.30	148,050.18	433,309.96	16,038.00	8.77	9.01	9.23	27.02
2000	114,212.98	139,527.35	154,860.94	408,601.27					

Graph D4: Multi Family Census D

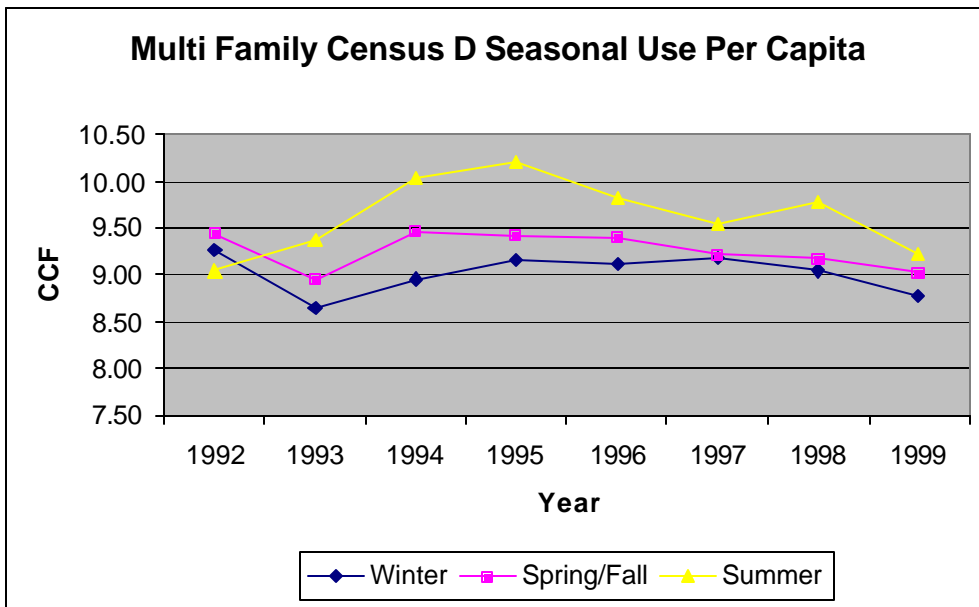


Table D6: Multi Family Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	52,261.44	65,541.61	107,264.37	225,067.43					
1992	126,329.54	127,481.90	115,967.91	369,779.36	12,570.00	10.05	10.14	9.23	29.42
1993	115,704.02	130,277.21	128,487.16	374,468.39	12,924.00	8.95	10.08	9.94	28.97
1994	122,286.28	128,034.71	132,479.70	382,800.69	12,776.00	9.57	10.02	10.37	29.96
1995	122,271.77	125,840.18	135,344.42	383,456.37	12,782.00	9.57	9.85	10.59	30.00
1996	120,167.17	126,780.77	129,444.08	376,392.02	12,696.00	9.46	9.99	10.20	29.65
1997	123,603.44	126,138.33	128,119.87	377,861.64	12,467.00	9.91	10.12	10.28	30.31
1998	117,936.94	125,975.90	131,339.81	375,252.66	12,566.00	9.39	10.03	10.45	29.86
1999	115,572.52	121,876.50	123,296.26	360,745.28	12,689.00	9.11	9.60	9.72	28.43
2000	104,877.26	123,517.26	134,328.92	362,723.44					

Graph D5: Multi Family Census E

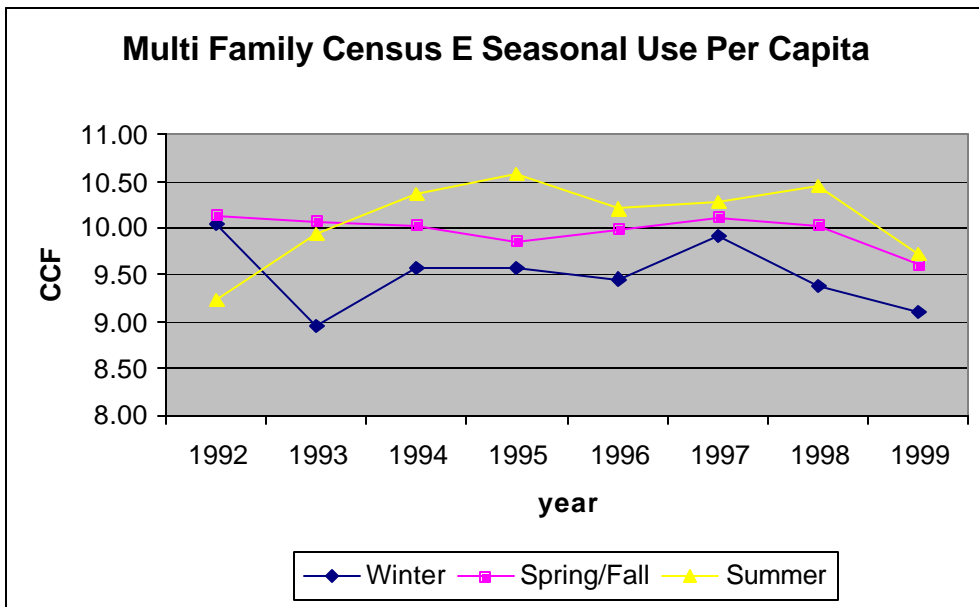


Table D7: Multi Family Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	103,916.88	134,214.10	230,644.74	468,775.72					
1992	247,740.04	257,717.42	245,355.86	750,813.32	21,649.00	11.44	11.90	11.33	34.68
1993	243,061.92	262,004.88	271,045.79	776,112.59	22,480.00	10.81	11.66	12.06	34.52
1994	244,654.32	265,699.75	276,841.79	787,195.87	22,038.00	11.10	12.06	12.56	35.72
1995	245,080.92	268,501.68	291,635.47	805,218.07	22,244.00	11.02	12.07	13.11	36.20
1996	258,957.00	263,343.33	285,423.52	807,723.85	22,704.00	11.41	11.60	12.57	35.58
1997	263,713.10	271,028.17	280,743.12	815,484.40	22,952.00	11.49	11.81	12.23	35.53
1998	257,192.14	267,827.14	282,682.72	807,702.00	23,096.00	11.14	11.60	12.24	34.97
1999	252,241.83	259,825.62	276,518.53	788,585.98	23,103.00	10.92	11.25	11.97	34.13
2000	214,764.08	256,946.86	293,090.90	764,801.84					

Graph D6: Multi Family Census F

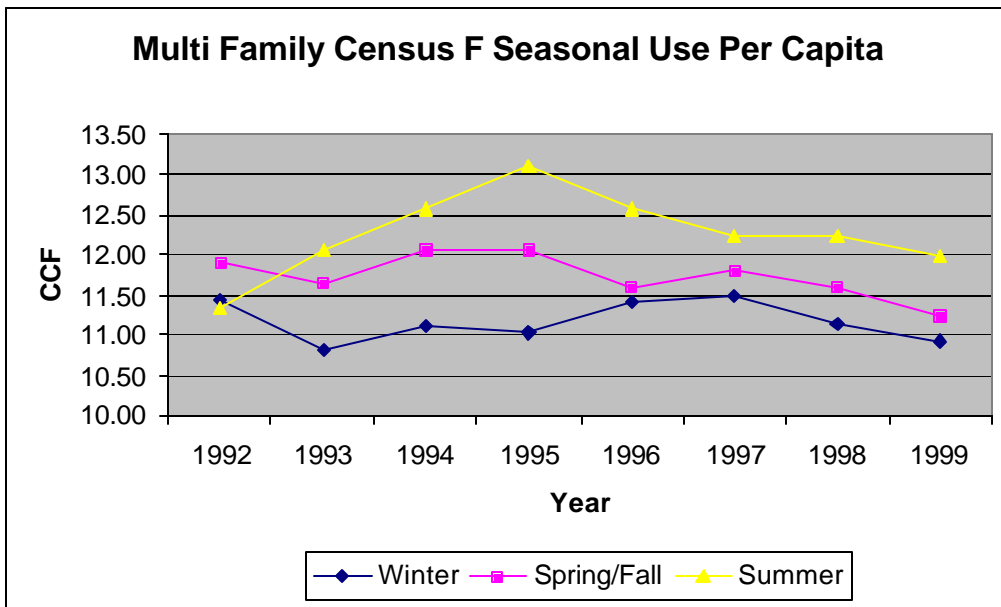


Table D8: Multi Family Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	112,324.02	134,640.68	224,037.30	471,002.00					
1992	273,698.84	278,443.16	262,235.70	814,377.70	23,885.00	11.46	11.66	10.98	34.10
1993	259,960.06	275,071.16	284,949.87	819,981.09	24,689.00	10.53	11.14	11.54	33.21
1994	265,324.84	276,230.38	286,309.84	827,865.06	24,321.00	10.91	11.36	11.77	34.04
1995	257,222.64	272,815.33	292,237.65	822,275.61	24,386.00	10.55	11.19	11.98	33.72
1996	264,320.52	271,580.72	282,654.00	818,555.24	24,086.00	10.97	11.28	11.74	33.98
1997	269,719.08	267,326.58	282,490.19	819,535.85	24,236.00	11.13	11.03	11.66	33.81
1998	259,770.72	269,736.55	286,180.80	815,688.07	24,334.00	10.68	11.08	11.76	33.52
1999	262,376.66	264,747.43	279,793.50	806,917.59	24,366.00	10.77	10.87	11.48	33.12
2000	207,824.23	271,059.39	303,107.66	781,991.28					

Graph D7: Multi Family Census G

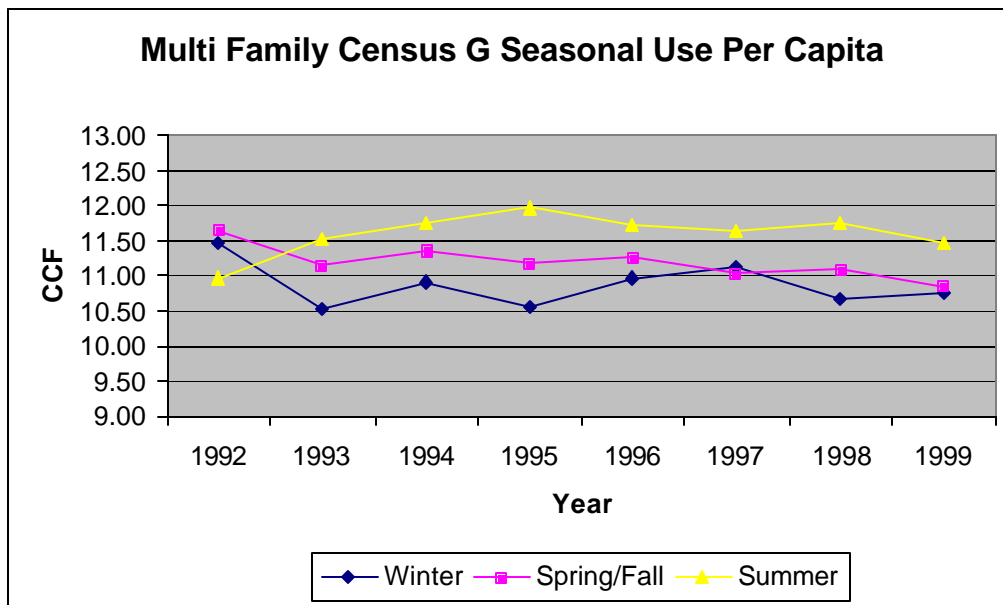


Table D9: Multi Family Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
						Per Capita/Per Season			
1991	118,596.47	104,419.22	170,674.59	393,690.29					
1992	240,459.23	257,632.68	250,075.63	748,167.54	19,621.00	12.26	13.13	12.75	38.13
1993	242,089.82	258,310.91	262,967.23	763,367.96	20,667.00	11.71	12.50	12.72	36.94
1994	246,394.59	252,078.47	264,688.40	763,161.45	19,853.00	12.41	12.70	13.33	38.44
1995	242,539.99	257,501.00	268,290.79	768,331.78	20,409.00	11.88	12.62	13.15	37.65
1996	242,065.09	260,111.54	273,798.52	775,975.15	21,225.00	11.40	12.25	12.90	36.56
1997	254,012.14	258,609.47	270,104.16	782,725.78	21,574.00	11.77	11.99	12.52	36.28
1998	254,210.21	267,271.63	273,449.83	794,931.68	22,323.00	11.39	11.97	12.25	35.61
1999	252,446.02	253,375.61	273,304.89	779,126.52	23,007.00	10.97	11.01	11.88	33.86
2000	192,818.11	264,879.05	279,141.71	736,838.87					

Graph D8: Multi Family Census H

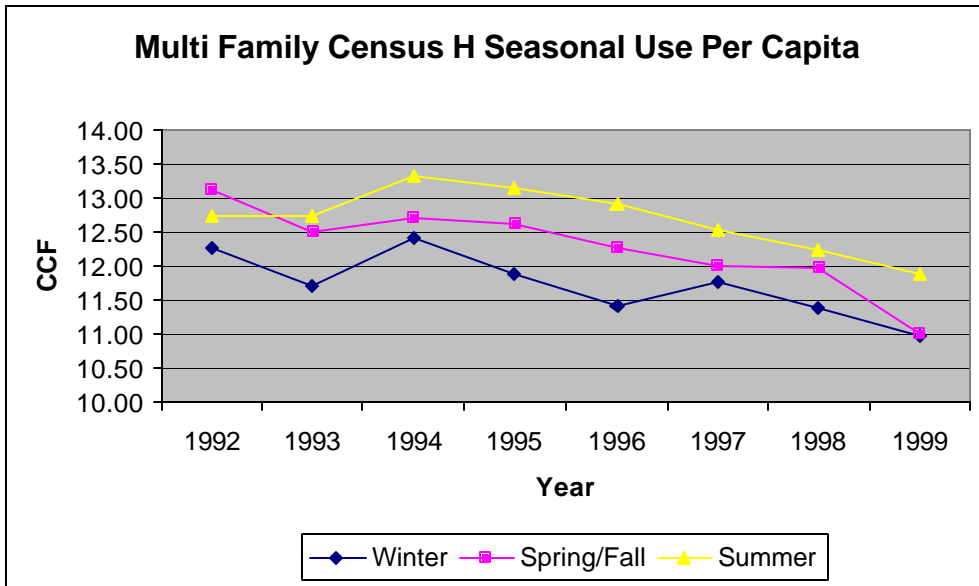


Table D10: Multi Family Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	57,259.76	69,797.68	112,778.96	239,836.40					
1992	138,307.08	142,786.19	139,495.33	420,588.60	14,423.00	9.59	9.90	9.67	29.16
1993	140,208.50	140,662.08	149,327.61	430,198.19	14,967.00	9.37	9.40	9.98	28.74
1994	142,251.62	145,873.65	154,969.62	443,094.89	14,637.00	9.72	9.97	10.59	30.27
1995	140,408.71	145,784.41	156,388.21	442,581.33	14,652.00	9.58	9.95	10.67	30.21
1996	145,440.08	153,480.35	160,060.76	458,981.19	14,714.00	9.88	10.43	10.88	31.19
1997	149,344.36	148,649.04	157,596.98	455,590.38	15,068.00	9.91	9.87	10.46	30.24
1998	144,474.21	148,038.00	156,863.17	449,375.37	15,157.00	9.53	9.77	10.35	29.65
1999	142,560.23	144,185.71	151,369.10	438,115.03	15,297.00	9.32	9.43	9.90	28.64
2000	122,194.85	148,117.38	161,963.38	432,275.62					

Graph D9: Multi Family Census I

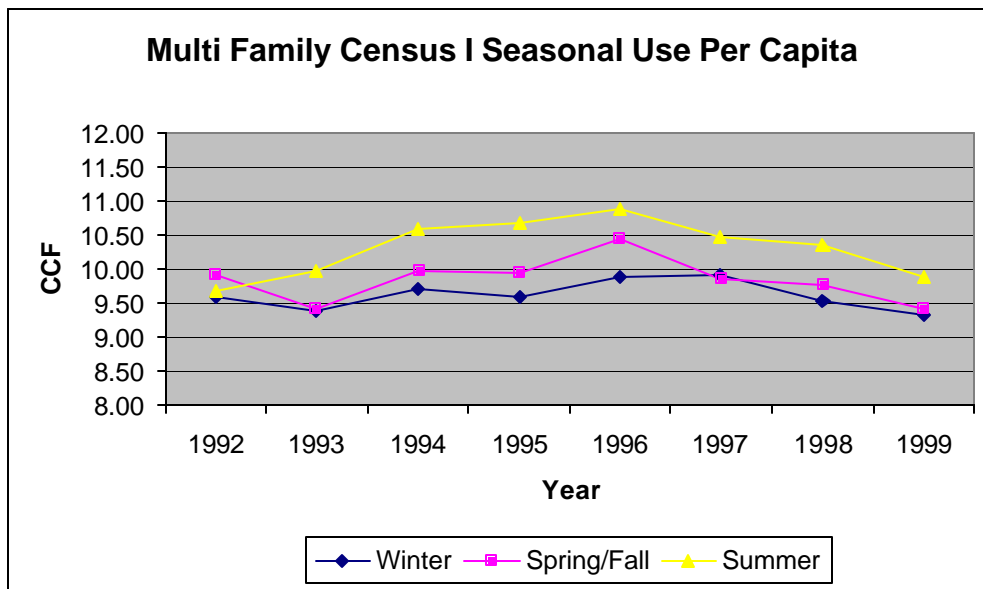


Table D11: Multi Family Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	46,365.88	57,751.14	95,844.54	199,961.56					
1992	109,865.72	114,944.96	111,158.29	335,968.96	13,483.00	8.15	8.53	8.24	24.92
1993	109,499.29	118,214.05	127,233.75	354,947.09	14,022.00	7.81	8.43	9.07	25.31
1994	113,438.87	120,982.69	133,683.04	368,104.60	13,681.00	8.29	8.84	9.77	26.91
1995	113,913.35	123,471.96	137,005.25	374,390.56	13,752.00	8.28	8.98	9.96	27.22
1996	120,818.10	124,039.01	137,934.19	382,791.30	14,160.00	8.53	8.76	9.74	27.03
1997	125,573.38	129,751.23	138,276.32	393,600.93	14,282.00	8.79	9.08	9.68	27.56
1998	128,785.51	134,074.88	147,147.30	410,007.70	14,389.00	8.95	9.32	10.23	28.49
1999	132,382.32	132,009.24	142,047.25	406,438.81	14,474.00	9.15	9.12	9.81	28.08
2000	99,572.91	131,707.23	148,732.65	380,012.79					

Graph D10: Multi Family Census J

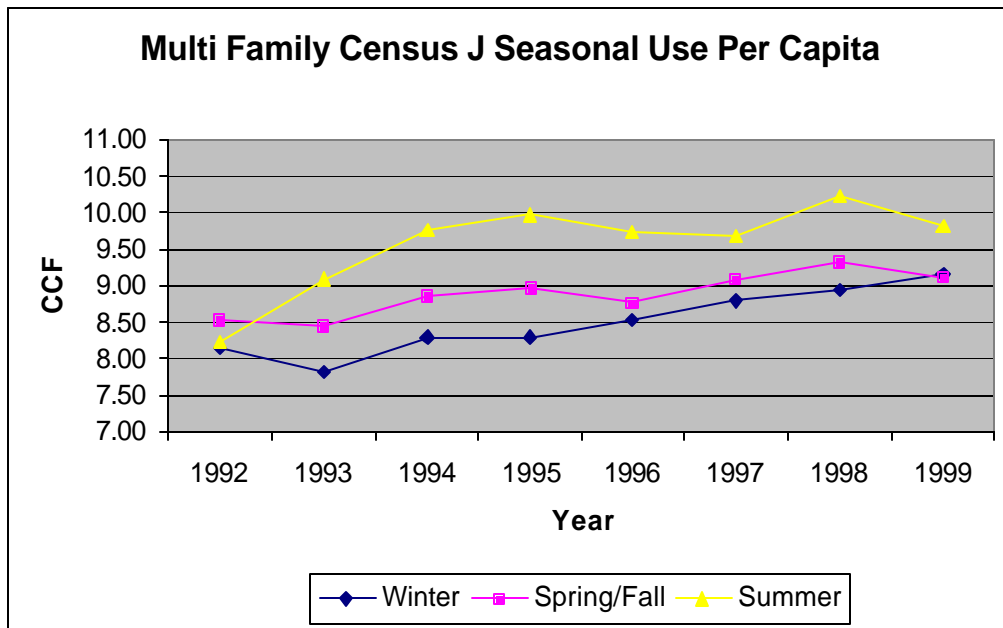
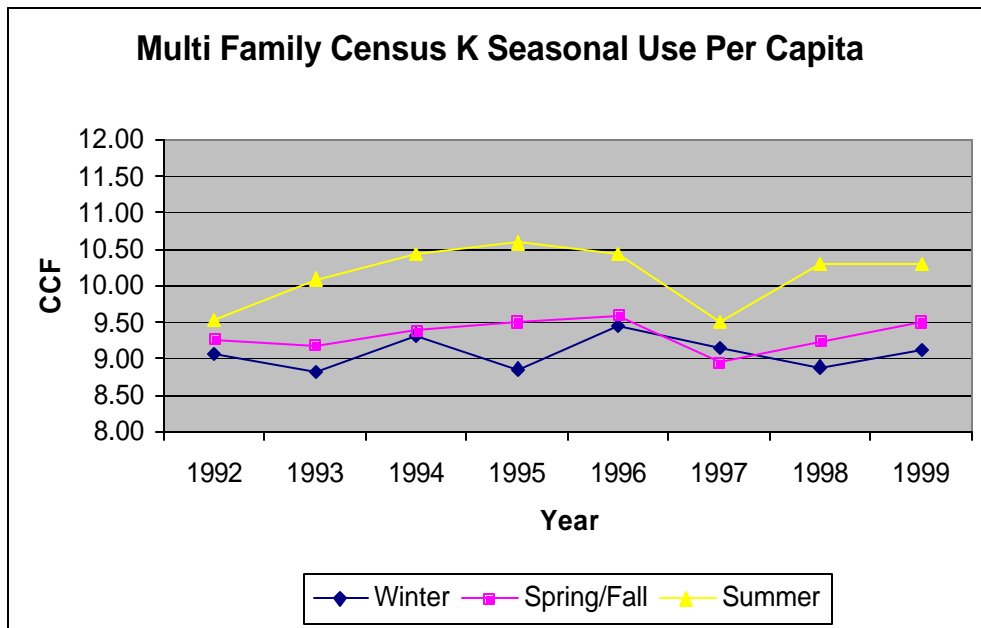


Table D12: Multi Family Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Population	Winter	Spring/Fall	Summer	Total Per Capita
1991	53,036.18	55,239.60	94,550.52	202,826.30					
1992	113,736.92	116,525.45	119,712.95	349,975.32	12,567.00	9.05	9.27	9.53	27.85
1993	114,499.73	119,212.51	130,974.96	364,687.19	12,979.00	8.82	9.19	10.09	28.10
1994	119,602.92	120,132.88	133,964.73	373,700.53	12,823.00	9.33	9.37	10.45	29.14
1995	114,987.30	123,257.57	137,398.30	375,643.17	12,975.00	8.86	9.50	10.59	28.95
1996	123,564.49	125,403.35	136,438.96	385,406.80	13,074.00	9.45	9.59	10.44	29.48
1997	120,385.84	117,562.30	124,859.33	362,807.47	13,162.00	9.15	8.93	9.49	27.56
1998	118,077.95	122,537.83	136,842.36	377,458.15	13,286.00	8.89	9.22	10.30	28.41
1999	122,689.55	127,797.36	138,553.43	389,040.34	13,471.00	9.11	9.49	10.29	28.88
2000	102,620.75	122,077.37	147,063.25	371,761.37					

Graph D11: Multi Family Census K



Appendix E: Government/Education Totals and Grouped Census

NOTE: 1996 & 1997 are averages added as assumptions of the missing employment data. All table data and graph data that was assumed are noted with [1996] and [1997].

Table E1: Government/Education Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
					Per Employee/Per Season				
1991	329,513.42	490,223.52	820,024.84	1,639,761.78					
1992	833,652.53	952,204.87	1,025,700.08	2,811,557.47					
1993	876,283.24	1,037,723.39	1,198,661.01	3,112,667.64					
1994	848,744.87	996,139.38	1,418,377.75	3,263,262.00					
1995	785,354.86	999,427.88	1,324,600.80	3,109,383.53	91923	8.544	10.87	14.41	33.83
[1996]	810,327.41	936,227.99	1,310,099.40	3,056,654.81		8.635	10.84	14.68	34.16
[1997]	899,247.36	933,940.38	1,201,406.53	3,034,594.26		8.726	10.82	14.95	34.49
1998	732,424.81	896,302.13	1,264,443.35	2,893,170.29	83069	8.817	10.79	15.22	34.83
1999	690,433.10	817,121.05	1,184,426.43	2,691,980.58	91188	7.572	8.961	12.99	29.52
2000	530,756.95	857,860.62	1,282,337.76	2,670,955.33					

Table E2: Government/Education Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	8081.69	13799.24	30479.64	52360.58					
1992	18946.72	23568.87	27285.83	69801.42					
1993	19158.03	26440.78	32988.52	78587.32					
1994	19689.18	26172.02	41692.51	87553.71					
1995	18960.76	26505.37	44877.28	90343.40	2424	7.822	10.93	18.51	37.27
[1996]	20346.68	26232.23	42659.14	89238.05		7.415	10.41	17.44	35.26
[1997]	18065.07	20533.78	31800.03	70398.88		7.009	9.879	16.37	33.25
1998	14973.06	21207.02	34683.72	70863.81	2268	6.602	9.351	15.29	31.25
1999	12669.89	19892.93	32450.36	65013.18	2599	4.875	7.654	12.49	25.01
2000	8991.65	17610.16	33308.91	59910.72					

Graph E1: Government/Education Census A

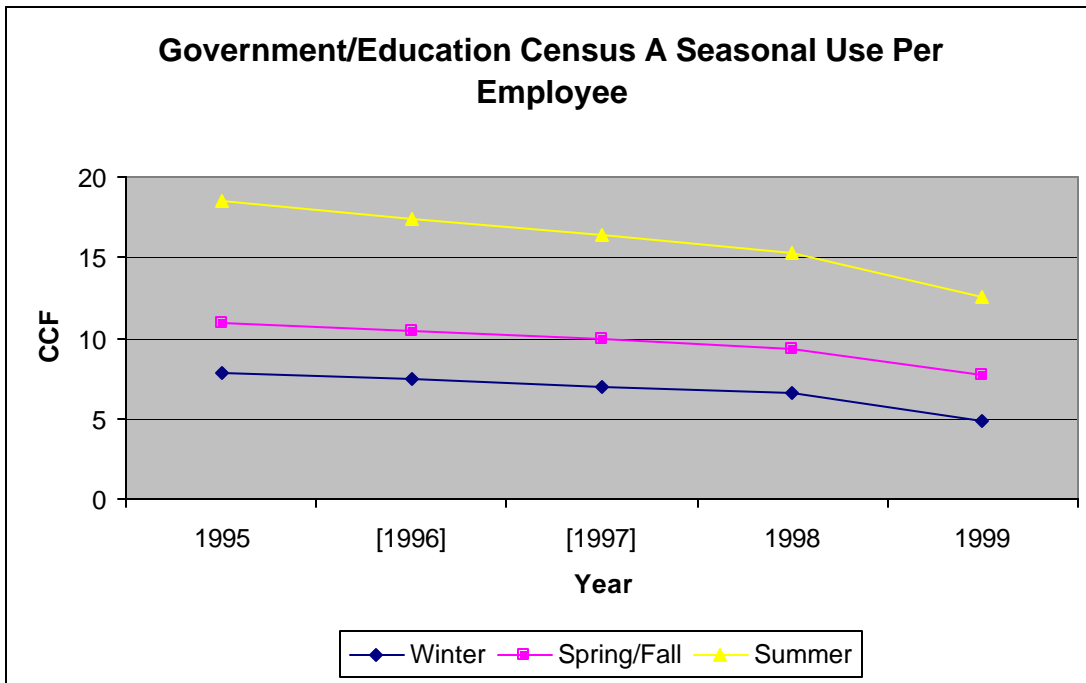


Table E3: Government/Education Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	7191.66	11360.25	24647.03	43198.94					
1992	15794.69	20841.29	23882.58	60518.56					
1993	19667.51	21456.88	18965.51	60089.90					
1994	23973.96	27582.37	37634.08	89190.41					
1995	20784.00	27507.48	31701.55	79993.03	899	23.12	30.6	35.26	88.98
[1996]	23741.69	34338.17	39833.59	97913.45		22.02	29.46	35.3	86.77
[1997]	14723.84	16908.82	25617.09	57249.76		20.91	28.31	35.33	84.56
1998	14185.57	19454.18	25318.80	58958.54	716	19.81	27.17	35.36	82.34
1999	13675.31	14508.68	19327.26	47511.25	891	15.35	16.28	21.69	53.32
2000	8602.42	12651.16	22211.59	43465.16					

Graph E2: Government/Education Census B

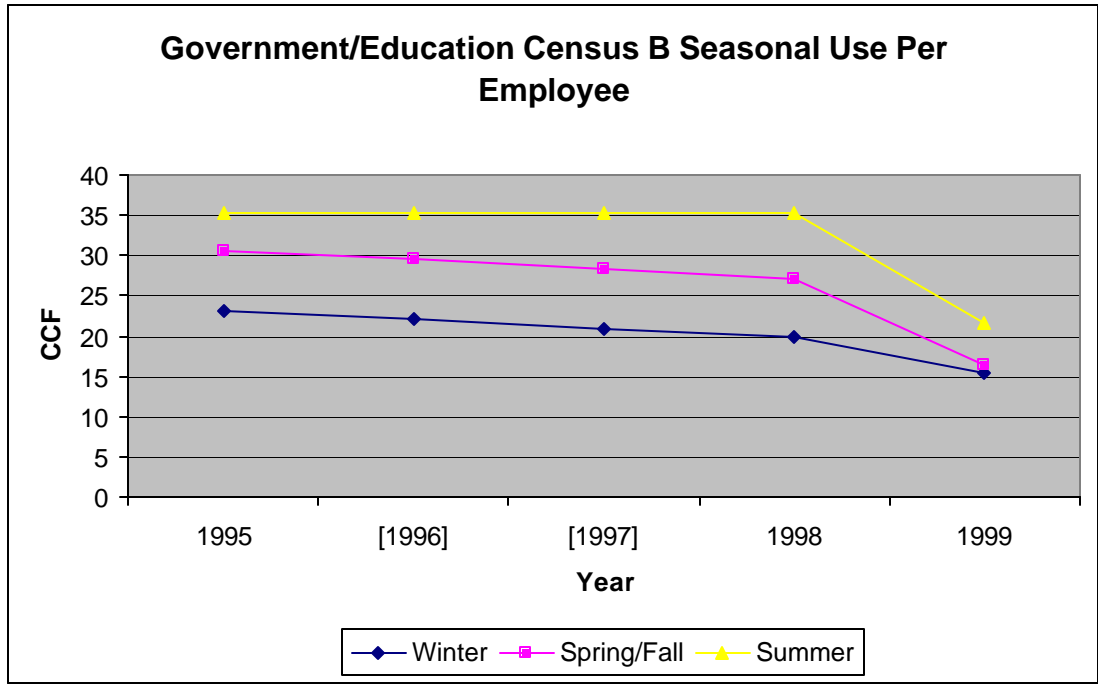


Table E4: Government/Education Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	4678.47	7914.92	15062.73	27656.12					
1992	23177.70	19531.55	24997.72	67706.96					
1993	41594.20	51038.16	72949.45	165581.81					
1994	38631.56	43450.92	73846.48	155928.96					
1995	36093.61	50068.87	67881.64	154044.12	872	41.39	57.42	77.85	176.7
1996	39543.55	40164.48	59324.49	139032.52		43.48	58.82	83.3	185.6
1997	36533.04	43079.43	67040.45	146652.91		45.56	60.22	88.76	194.5
1998	37350.96	48312.73	73864.33	159528.01	784	47.64	61.62	94.21	203.5
1999	31823.48	39487.90	65964.96	137276.35	936	34	42.19	70.48	146.7
2000	29002.44	44157.92	66334.88	139495.24					

Graph E3: Government/Education Census C

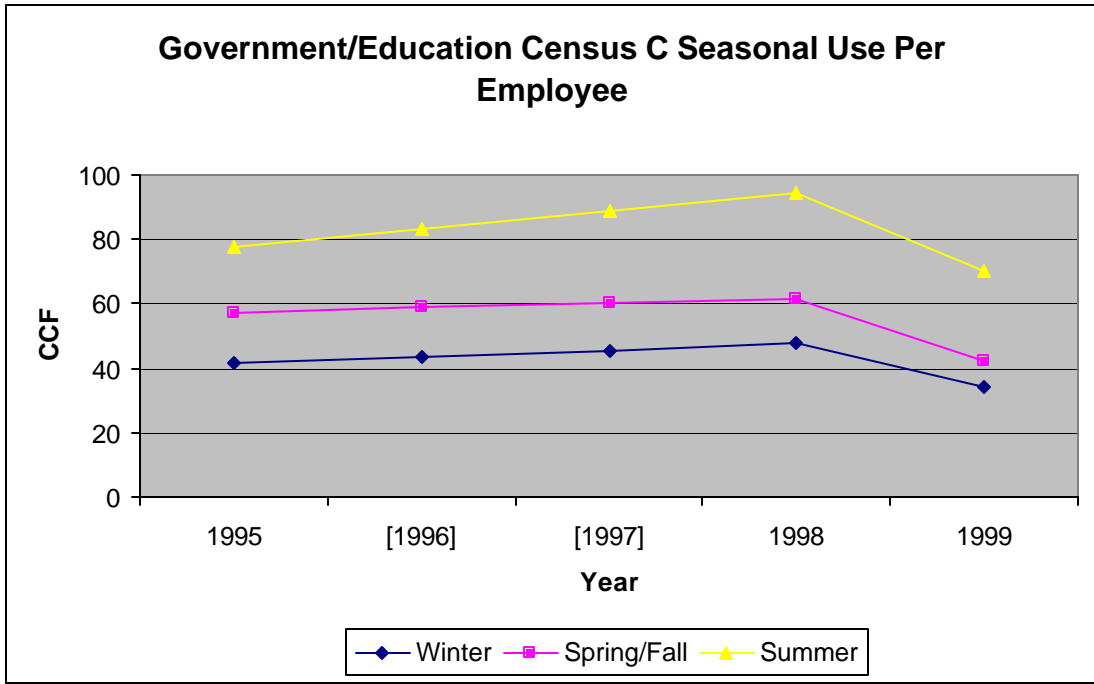


Table E5: Government/Education Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	9253.57	11828.84	36495.24	57577.65					
1992	18916.08	20558.09	20629.56	60103.72					
1993	17901.47	23718.60	27653.36	69273.43					
1994	17119.23	23608.50	43831.94	84559.67					
1995	17523.58	24151.68	44490.59	86165.85	977	17.94	24.72	45.54	88.19
[1996]	19637.04	25153.99	63977.59	108768.63		18.24	25.64	47.2	91.08
[1997]	20467.23	25156.10	36547.05	82170.38		18.55	26.56	48.86	93.96
1998	17102.97	24918.09	45816.73	87837.79	907	18.86	27.47	50.51	96.84
1999	17320.11	23088.72	37990.61	78399.44	615	28.16	37.54	61.77	127.5
2000	14040.66	21104.32	48698.46	83843.44					

Graph E4: Government/Education Census D

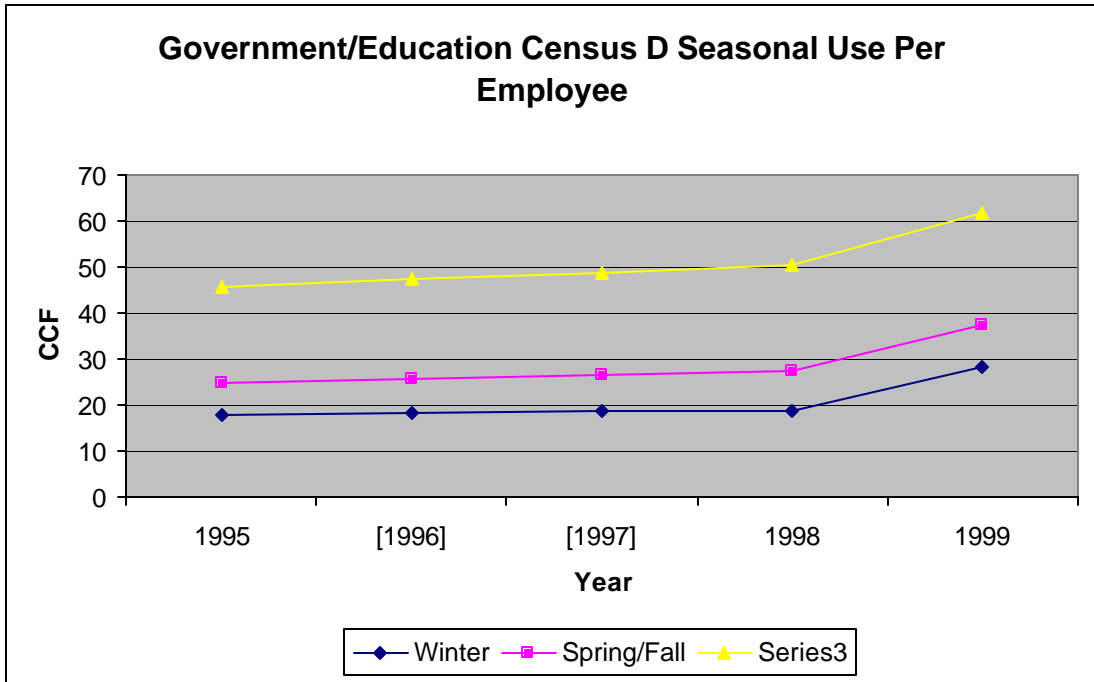


Table E6: Government/Education Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	125760.56	187905.47	146585.76	460251.79					
1992	308892.63	352218.67	368875.87	1029987.18					
1993	304992.04	367151.00	380620.20	1052763.24					
1994	317767.39	347778.46	415392.88	1080938.73					
1995	304025.04	367327.34	370801.16	1042153.54	27384	11.1	13.41	13.54	38.06
[1996]	308953.35	339599.65	392791.76	1041344.75		11.52	13.47	14.47	39.46
[1997]	430291.57	379964.58	388796.46	1199052.61		11.93	13.53	15.4	40.86
1998	300803.38	330967.27	397830.16	1029600.81	24360	12.35	13.59	16.33	42.27
1999	285101.21	308371.54	397347.35	990820.09	25879	11.02	11.92	15.35	38.29
2000	207570.64	337217.52	410107.10	954895.26					

Graph E5: Government/Education Census E

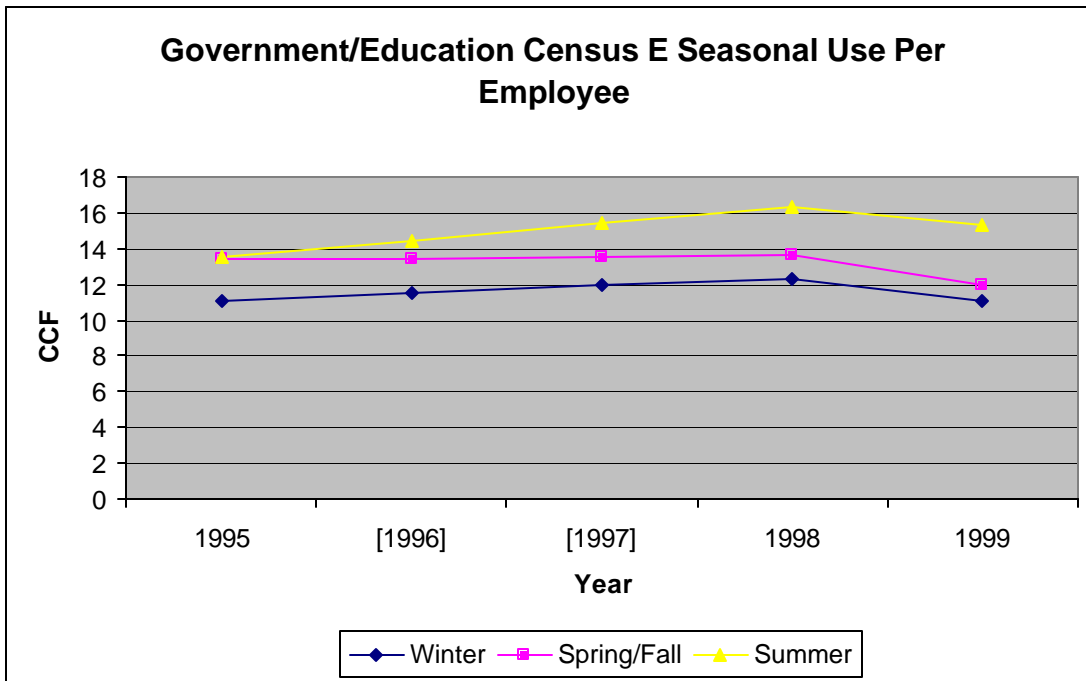


Table E7: Government/Education Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	23411.10	36119.78	75443.07	134973.96					
1992	51762.53	59986.69	55633.66	167382.88					
1993	52816.26	67006.34	73951.71	193774.31					
1994	51308.43	67389.25	101535.46	220233.14					
1995	44331.00	57888.80	92024.93	194244.73	4071	10.89	14.22	22.6	47.71
[1996]	51969.84	58875.03	96427.65	207272.52		11.4	15.04	24.62	51.05
[1997]	49257.09	59547.91	87896.41	196701.42		11.9	15.85	26.63	54.39
1998	45502.57	61126.43	105032.50	211661.50	3667	12.41	16.67	28.64	57.72
1999	46675.61	58295.91	93386.71	198358.23	6033	7.737	9.663	15.48	32.88
2000	43816.27	63287.99	112722.46	219826.72					

Graph E6: Government/Education Census F

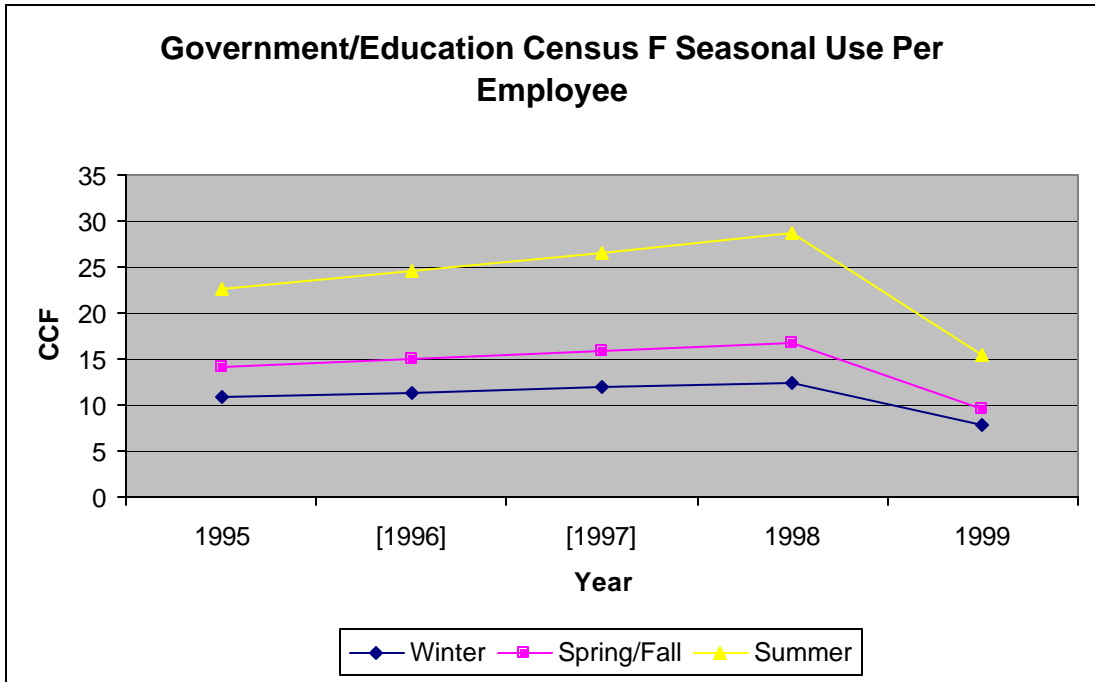


Table E8: Government/Education Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	29588.77	42732.56	105171.19	177492.52					
1992	101116.82	108548.24	110060.05	319725.12					
1993	99210.96	99678.69	91778.76	290668.41					
1994	60459.35	68618.37	87097.61	216175.33					
1995	46764.57	68242.94	95178.67	210186.18	1962	23.84	34.78	48.51	107.1
[1996]	40258.41	45554.33	61012.01	146824.75		21.47	32.01	45.32	98.8
[1997]	31155.50	38562.78	53396.31	123114.59		19.1	29.24	42.13	90.47
1998	28920.37	45763.18	67334.65	142018.19	1729	16.73	26.47	38.94	82.14
1999	27171.20	39884.94	60627.53	127683.67	1404	19.35	28.41	43.18	90.94
2000	26985.85	47505.26	83118.60	157609.70					

Graph E7: Government/Education Census G

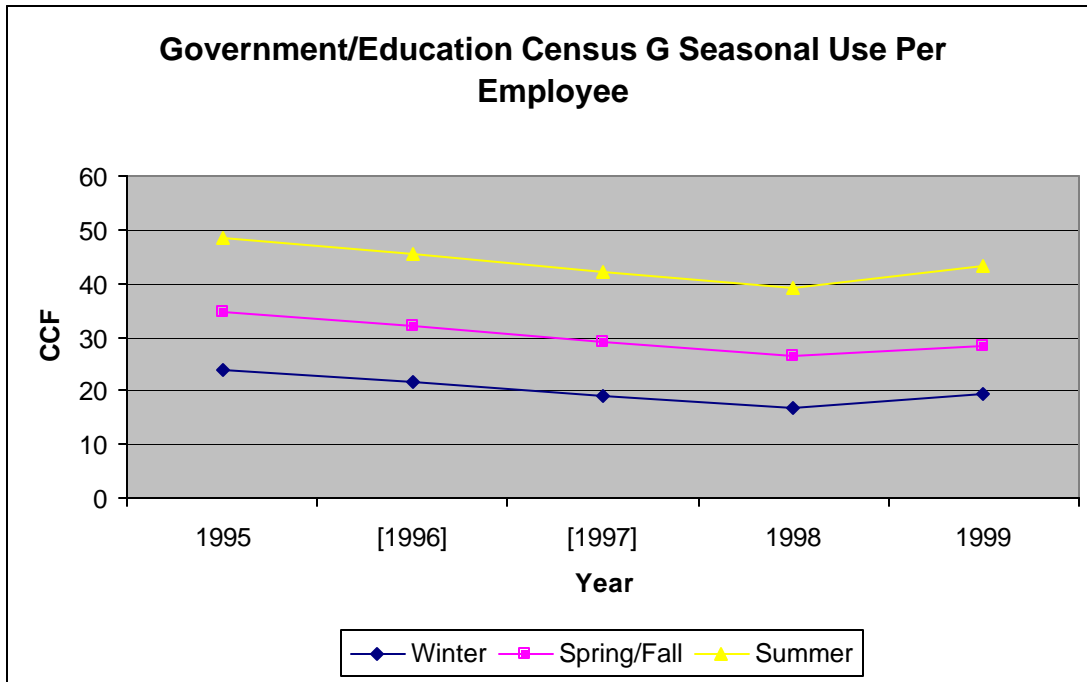


Table E9: Government/Education Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	34013.54	42312.69	74120.87	150447.10					
1992	68173.06	80232.18	93373.13	241778.38					
1993	70907.23	85170.25	101512.80	257590.29					
1994	68865.52	88004.04	116108.51	272978.06					
1995	70763.16	89882.26	115366.24	276011.66	33857	2.09	2.655	3.407	8.152
1996	70719.69	85959.69	113483.65	270163.03		2.306	2.827	3.497	8.63
1997	77795.11	88528.47	108969.70	275293.28		2.522	2.999	3.586	9.107
1998	80448.34	93172.74	108010.38	281631.46	29385	2.738	3.171	3.676	9.584
1999	78696.50	89279.52	109561.62	277537.64	39561	1.989	2.257	2.769	7.015
2000	63430.76	94736.78	115966.57	274134.11					

Graph E8: Government/Education Census H

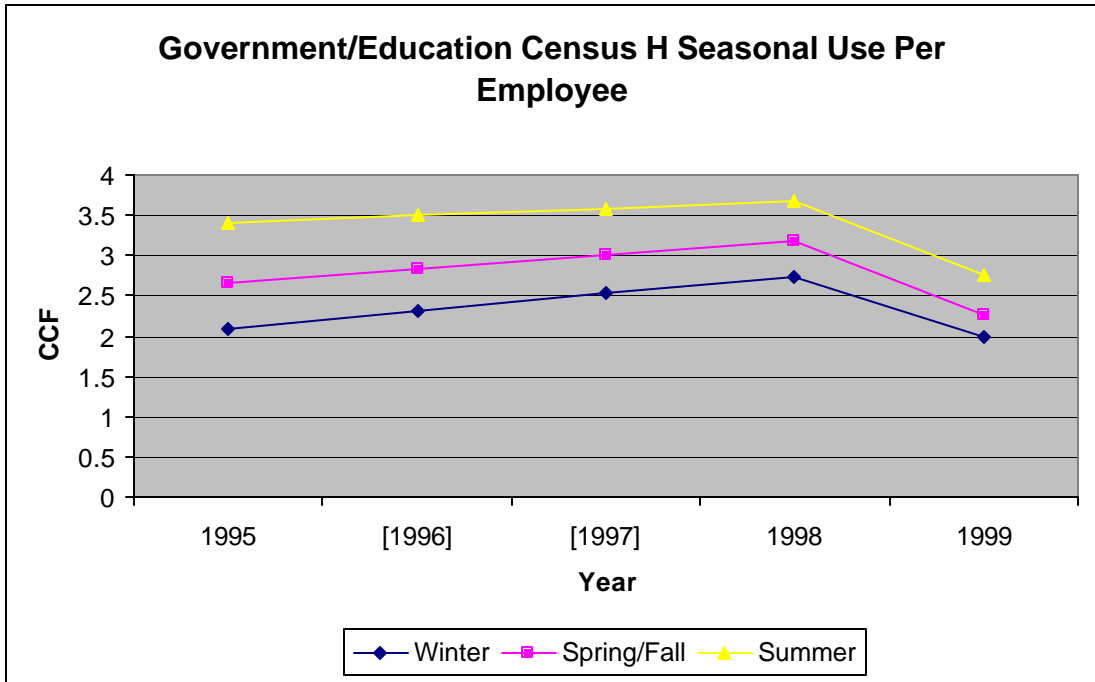


Table E10: Government/Education Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	39233.39	70380.48	157512.74	267126.61					
1992	104877.19	129044.28	144670.10	378591.57					
1993	116134.29	146026.02	202643.47	464803.79					
1994	118880.57	140987.05	226988.90	486856.51					
1995	100568.25	134028.05	209261.56	443857.86	14843	6.775	9.03	14.1	29.9
[1996]	113022.53	135600.31	202324.06	450946.90		6.528	8.792	13.71	29.03
[1997]	100995.78	121698.47	195197.62	417891.87		6.28	8.554	13.33	28.16
1998	91395.46	125989.25	196125.27	413509.98	15150	6.033	8.316	12.95	27.29
1999	89220.73	115425.03	185442.42	390088.18	9715	9.184	11.88	19.09	40.15
2000	68681.34	121745.90	201436.63	391863.87					

Graph E9: Government/Education Census I

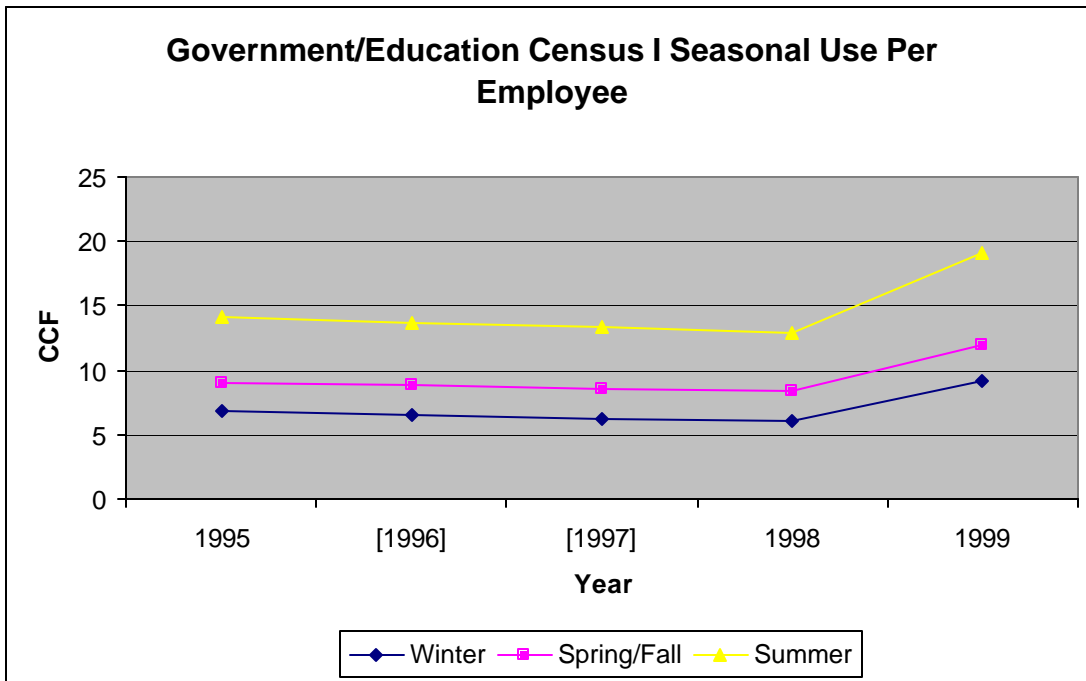


Table E11: Government/Education Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	11923.94	20774.82	41732.25	74431.02					
1992	37792.23	42915.95	59247.06	139955.24					
1993	45712.65	60107.82	88982.19	194802.67					
1994	52562.47	63572.73	138449.02	254584.22					
1995	43588.35	55539.14	111700.05	210827.54	802	54.35	69.25	139.3	262.9
1996	46597.72	52157.12	106727.05	205481.89		58.28	74.78	145.3	278.4
1997	54106.90	61925.60	108050.48	224082.98		62.22	80.31	151.3	293.8
1998	47362.11	61458.91	112651.66	221472.67	716	66.15	85.84	157.3	309.3
1999	37904.15	51859.16	89521.69	179285.00	557	68.05	93.1	160.7	321.9
2000	28861.37	55274.07	114714.33	198849.77					

Graph E10: Government/Education Census J

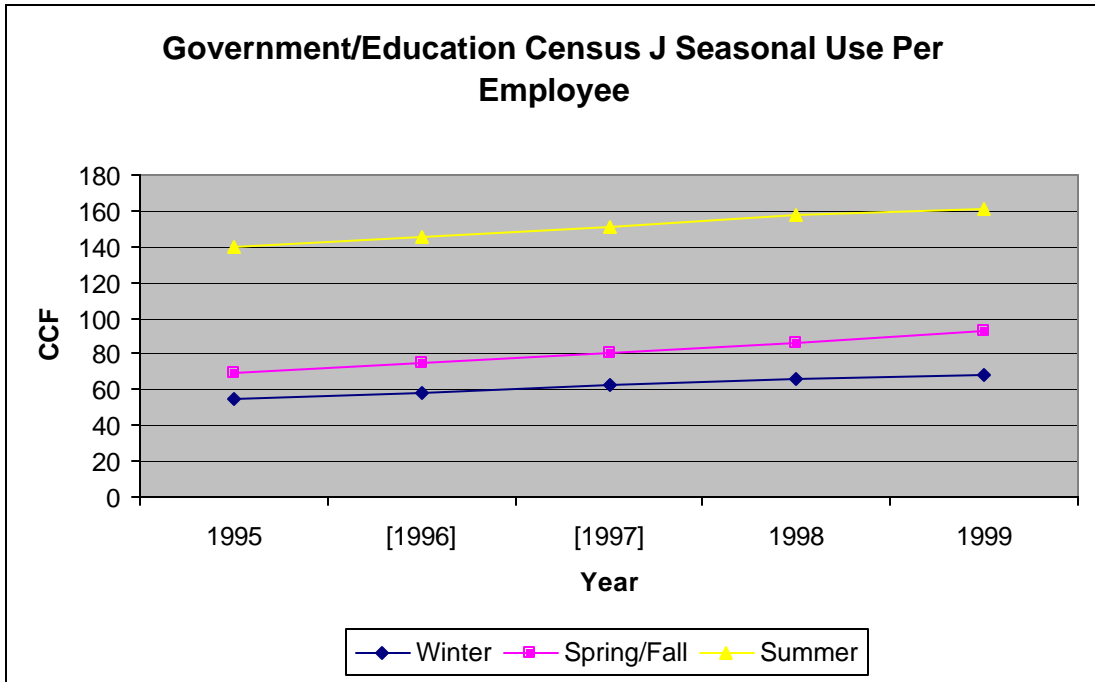
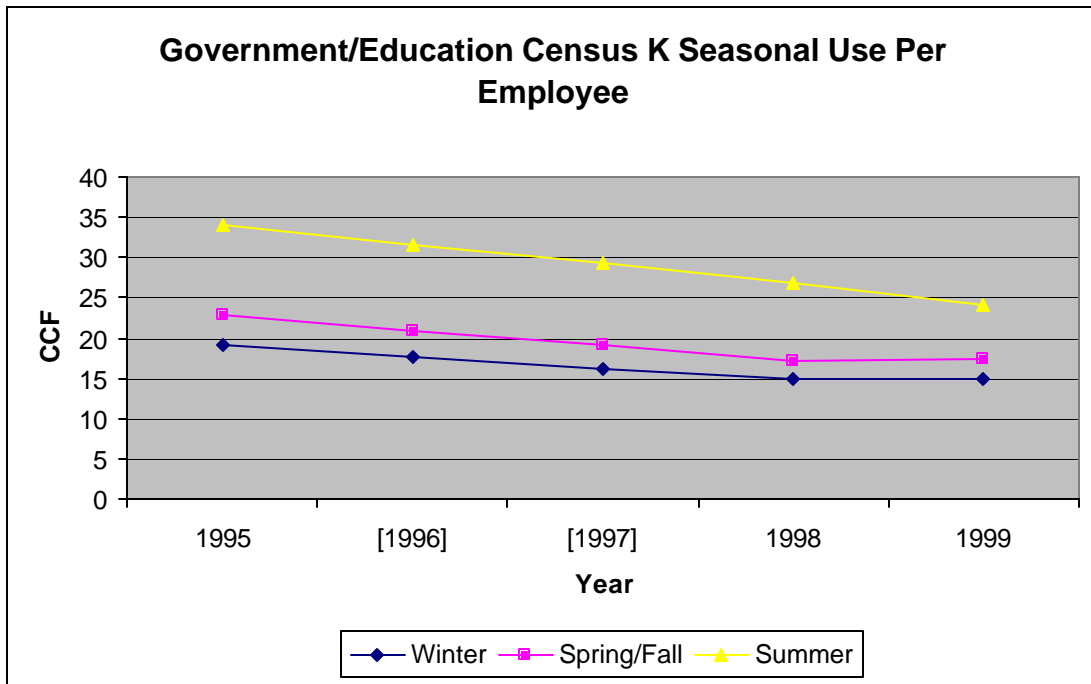


Table E12: Government/Education Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	30598.52	39001.18	93503.99	163103.69					
1992	68446.05	76393.24	77216.48	222055.77					
1993	70287.39	76646.54	91460.56	238394.49					
1994	70256.73	88331.50	122369.46	280957.69					
1995	72907.52	87479.06	130220.59	290607.17	3832	19.03	22.83	33.98	75.84
[1996]	67286.35	78284.59	112970.88	258541.82		17.62	20.97	31.61	70.2
[1997]	60812.76	73346.76	93618.62	227778.14		16.22	19.12	29.23	64.56
1998	50160.21	58482.09	90945.27	199587.57	3387	14.81	17.27	26.85	58.93
1999	44865.05	52222.03	71903.88	168990.95	2998	14.96	17.42	23.98	56.37
2000	29372.04	41397.68	72527.28	143297.00					

Graph E 11: Government/Education Census K



Appendix F: Manufacturing Totals and Grouped Census

NOTE: 1996 is an average of 1995 and 1997 created as an assumption of the missing employment data. All table data and graph data that was assumed are noted with [1996].

Table F1: Manufacturing Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
					Per Employee/Per Season				
1991	281,765.68	297,686.13	515,142.77	1,094,594.59					
1992	724,755.11	552,712.71	476,112.85	1,753,580.67					
1993	550,762.25	554,927.36	523,259.93	1,628,949.54					
1994	564,942.64	505,715.33	511,235.36	1,581,893.33					
1995	488,440.68	488,683.28	509,057.55	1,486,181.52	39,791	12.28	12.28	12.79	37.35
[1996]	482,871.81	514,014.31	520,876.24	1,517,762.35		12.14	12.68	13.25	38.48
1997	521,522.90	531,768.48	557,476.21	1,610,767.59	40,663.00	12.01	13.08	13.71	39.61
1998	547,332.49	546,974.01	572,228.69	1,666,535.18	40,284.00	12.12	13.58	14.20	41.37
1999	489,364.64	483,714.65	473,336.86	1,446,416.15	35,260.00	13.85	13.72	13.42	41.02
2000	323,587.31	401,366.34	473,123.43	1,198,077.08					

Table F2: Manufacturing Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	43.910.07	53.105.31	90.831.24	187.846.62					
1992	96.075.78	106.077.47	109.396.46	311.549.71					
1993	94.495.27	106.358.11	120.253.56	321.106.94					
1994	94.423.28	105.832.14	126.119.65	326.375.07					
1995	91.005.08	102.770.39	134.017.19	327.792.66	313.00	290.75	328.34	428.17	1047.26
[1996]	94.354.01	99.303.16	122.753.88	316.411.05		289.21	320.12	399.75	1009.08
1997	90.616.10	98.249.82	116.965.90	305.831.81	315.00	287.67	311.90	371.32	970.89
1998	90.176.35	100.823.29	120.241.35	311.240.99	364.00	247.74	276.99	330.33	855.06
1999	89.406.49	99.496.43	113.881.44	302.784.36	391.00	228.66	254.47	291.26	774.38
2000	63.614.88	91.243.87	114.646.38	269.505.12					

Graph F1: Manufacturing Census A

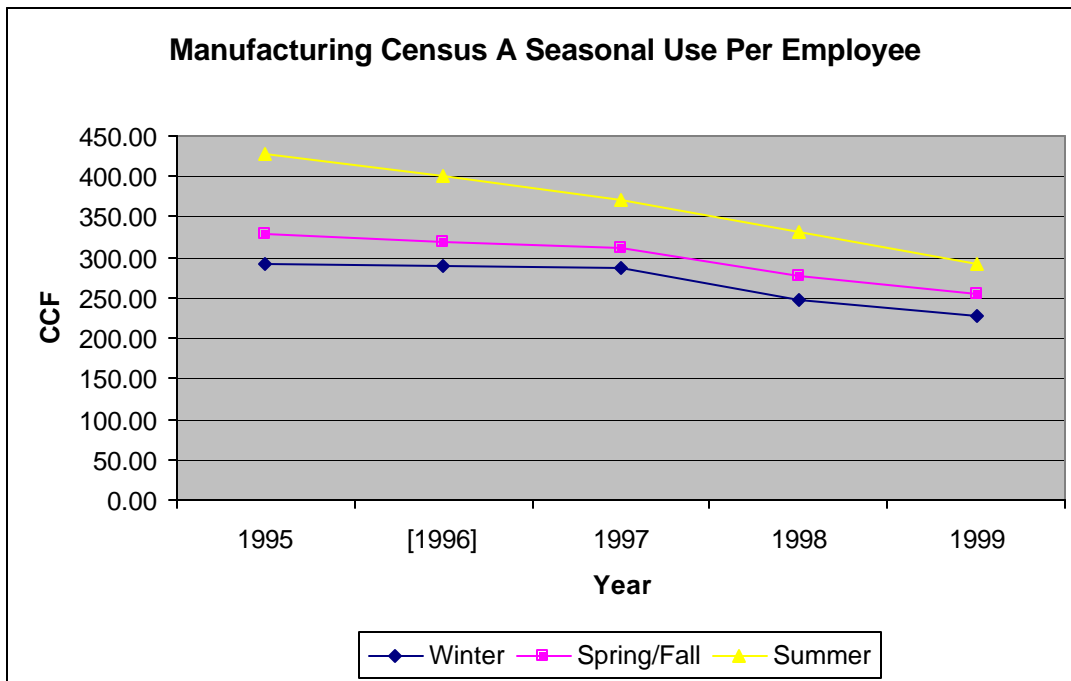


Table F3: Manufacturing Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	34,996.89	41,666.15	72,720.26	149,383.30					
1992	74,083.60	85,515.56	91,236.43	250,835.59					
1993	75,563.67	81,472.60	86,952.09	243,988.36					
1994	72,232.00	78,907.50	96,625.90	247,765.40					
1995	71,070.47	77,362.22	92,830.29	241,262.98	219.00	324.52	353.25	423.88	1101.66
[1996]	71,062.51	75,353.68	88,538.82	234,955.01		261.87	281.91	334.73	878.51
1997	72,913.06	77,067.78	89,880.99	239,861.84	366.00	199.22	210.57	245.58	655.36
1998	72,519.15	76,876.26	84,634.31	234,029.72	226.00	320.88	340.16	374.49	1035.53
1999	66,770.03	71,439.70	79,091.93	217,301.65	228.00	292.85	313.33	346.89	953.08
2000	47,575.61	69,165.26	83,753.51	200,494.38					

Graph F2: Manufacturing Census B

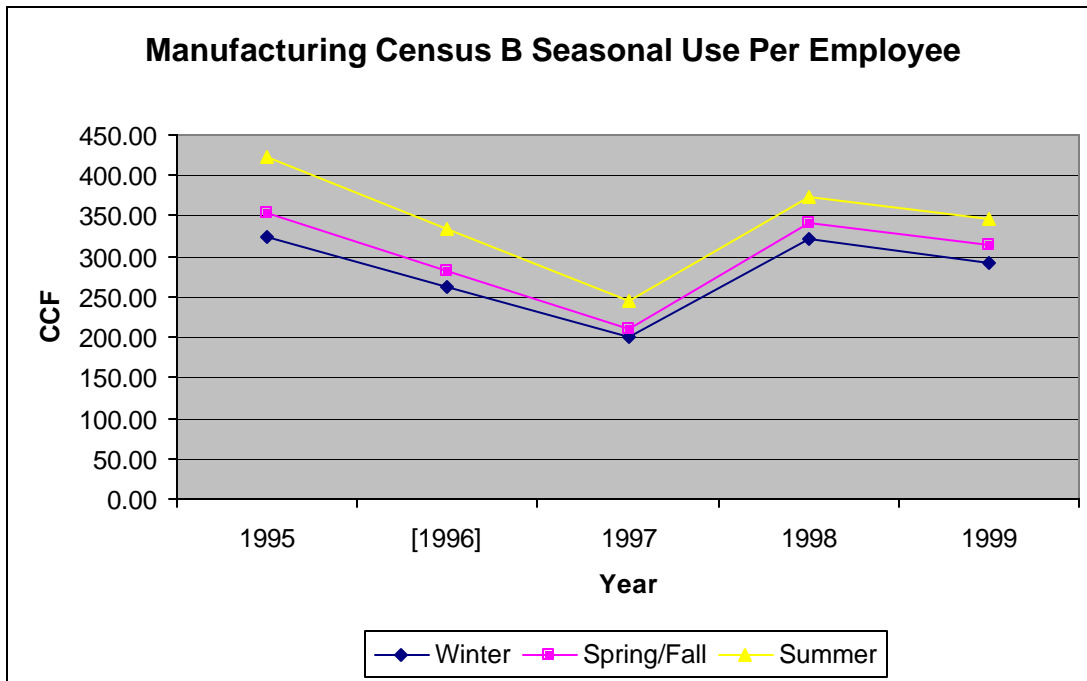


Table F4: Manufacturing Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	34.996.89	41.666.15	72.720.26	149.383.30					
1992	74.083.60	85.515.56	91.236.43	250.835.59					
1993	75.563.67	81.472.60	86.952.09	243.988.36					
1994	72.232.00	78.907.50	96.625.90	247.765.40					
1995	71.070.47	77.362.22	92.830.29	241.262.98	219.00	324.52	353.25	423.88	1101.66
[1996]	71.062.51	75.353.68	88.538.82	234.955.01		261.87	281.91	334.73	878.51
1997	72.913.06	77.067.78	89.880.99	239.861.84	366.00	199.22	210.57	245.58	655.36
1998	72.519.15	76.876.26	84.634.31	234.029.72	226.00	320.88	340.16	374.49	1035.53
1999	66.770.03	71.439.70	79.091.93	217.301.65	228.00	292.85	313.33	346.89	953.08
2000	47.575.61	69.165.26	83.753.51	200.494.38					

Graph F3: Manufacturing Census C

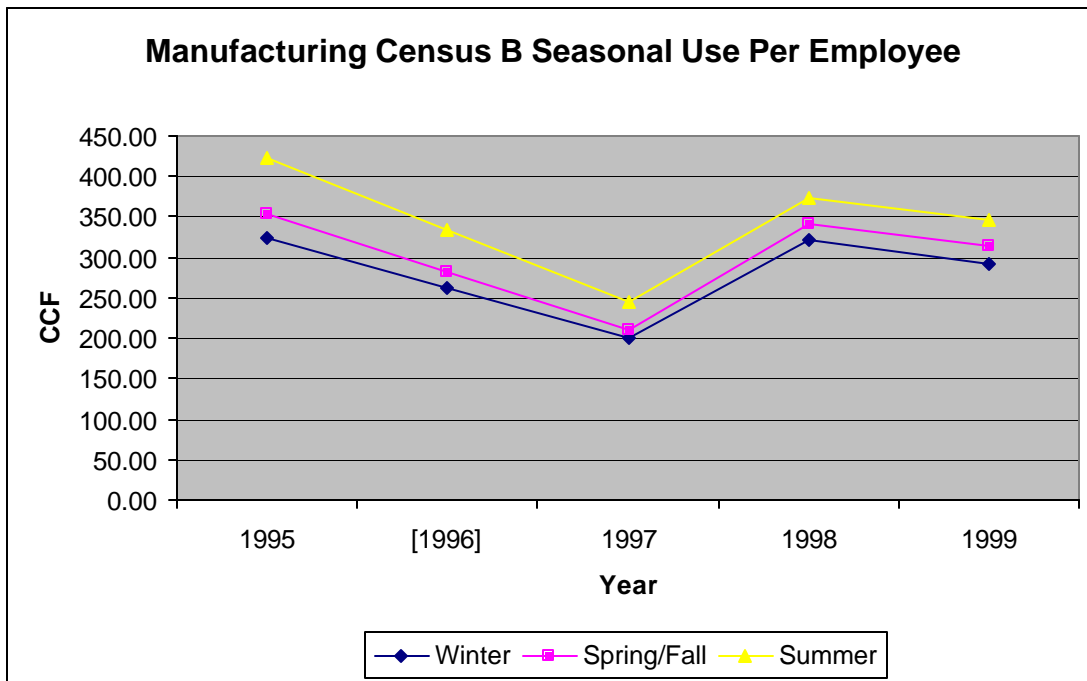


Table F5: Manufacturing Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	42,424.03	57,575.92	96,627.26	196,627.21					
1992	108,118.84	120,067.80	125,402.07	353,588.71					
1993	107,037.44	124,470.77	142,101.88	373,610.10					
1994	117,073.47	124,530.63	149,634.78	391,238.88					
1995	111,367.94	125,596.58	147,713.33	384,677.85	1,996.00	55.80	62.92	74.00	192.72
[1996]	113,638.23	125,714.89	143,370.28	382,723.40		57.79	64.23	72.89	194.90
1997	120,693.14	132,308.74	144,902.65	397,904.53	2,019.00	59.78	65.53	71.77	197.08
1998	119,442.34	131,589.76	140,118.74	391,150.84	2,142.00	55.76	61.43	65.41	182.61
1999	106,221.95	114,381.40	132,139.76	352,743.11	2,233.00	47.57	51.22	59.18	157.97
2000	83,750.29	117,522.16	141,217.19	342,489.64					

Graph F4: Manufacturing Census D

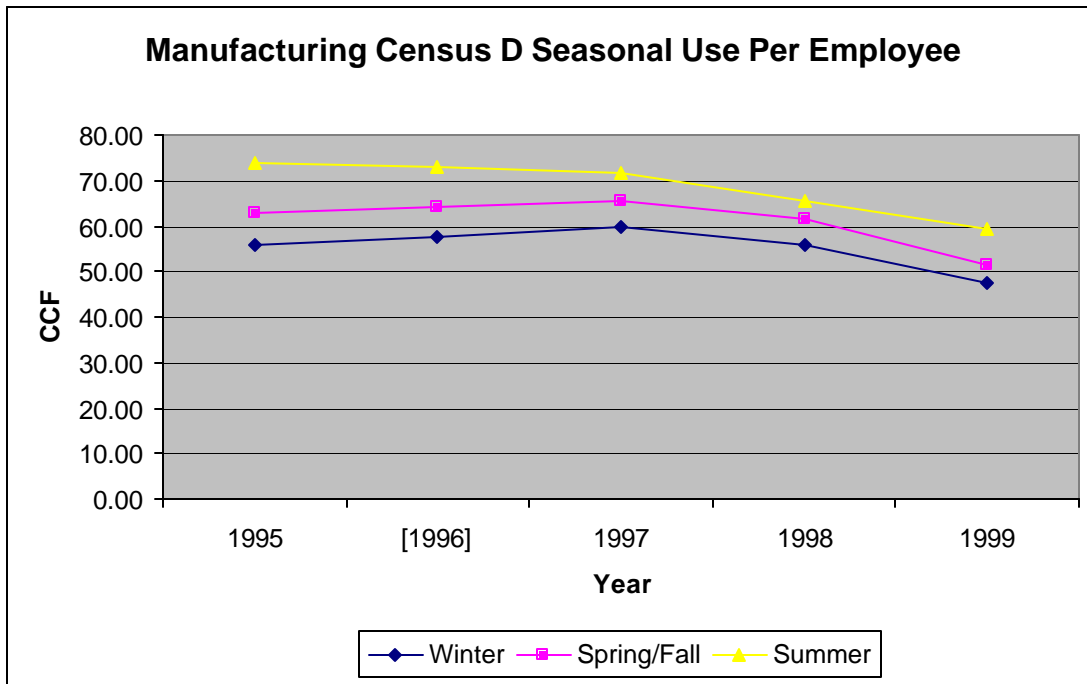


Table F6: Manufacturing Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	40,761.93	58,091.78	113,518.82	212,372.53					
1992	97,408.77	110,665.38	122,661.60	330,735.76					
1993	97,171.66	123,540.01	139,517.47	360,229.13					
1994	100,242.16	111,736.41	143,793.56	355,772.13					
1995	105,133.58	118,372.97	152,815.12	376,321.67	358.00	293.67	330.65	426.86	1051.18
[1996]	95,775.76	110,545.54	141,875.29	348,196.59		298.41	337.47	416.71	1052.58
1997	97,308.24	110,516.75	130,505.24	338,330.23	321.00	303.14	344.29	406.56	1053.99
1998	98,673.15	112,634.26	145,105.83	356,413.23	273.00	361.44	412.58	531.52	1305.54
1999	93,938.75	106,163.42	142,464.02	342,566.20	141.00	666.23	752.93	1010.38	2429.55
2000	86,071.39	108,475.96	150,507.75	345,055.10					

Graph F5: Manufacturing Census E

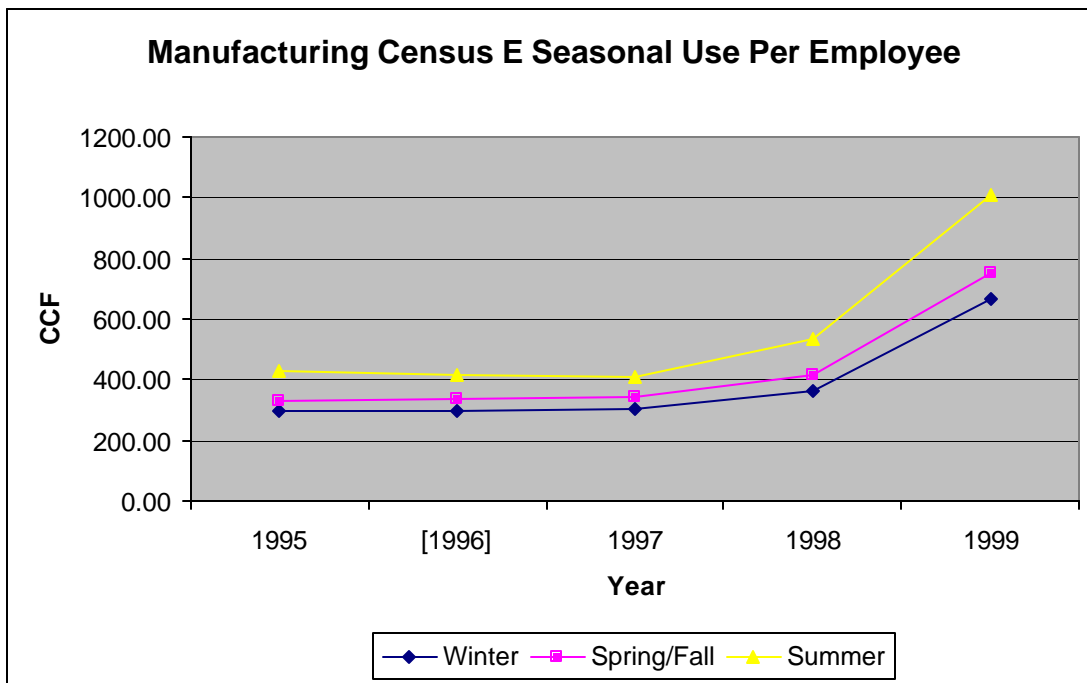


Table F7: Manufacturing Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	57,573.75	77,986.90	151,436.44	286,997.10					
1992	135,348.49	148,799.44	159,950.57	444,098.51					
1993	130,650.98	152,507.01	165,741.46	448,899.44					
1994	132,763.45	151,738.88	171,497.25	455,999.57					
1995	127,290.21	149,964.24	179,324.28	456,578.73	7,072.00	18.00	21.21	25.36	64.56
[1996]	135,901.68	146,809.72	183,170.54	465,881.94		18.28	20.68	24.82	63.79
1997	127,278.95	138,222.30	166,445.03	431,946.29	6,855.00	18.57	20.16	24.28	63.01
1998	126,627.69	145,937.08	176,413.77	448,978.55	5,478.00	23.12	26.64	32.20	81.96
1999	137,529.74	153,115.58	184,497.35	475,142.67	6,108.00	22.52	25.07	30.21	77.79
2000	122,400.37	153,881.63	195,974.68	472,256.67					

Graph F6: Manufacturing Census F

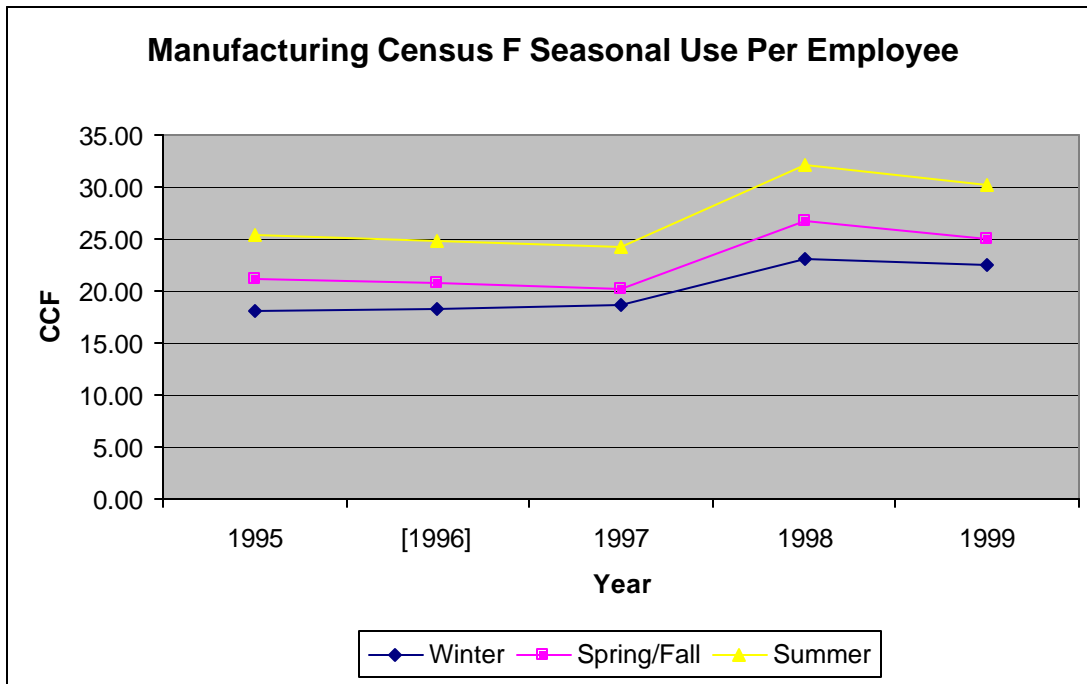


Table F8: Manufacturing Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	36,116.52	52,521.16	87,885.22	176,522.90					
1992	83,156.11	91,270.83	93,842.17	268,269.11					
1993	80,400.52	93,244.11	101,868.28	275,512.91					
1994	88,038.48	99,579.70	118,094.32	305,712.50					
1995	84,835.86	94,663.19	120,695.20	300,194.24	371.00	228.67	255.16	325.32	809.15
[1996]	83,572.94	94,107.74	106,515.32	284,195.99		219.66	234.87	289.80	744.33
1997	83,210.83	84,756.41	100,442.72	268,409.96	395.00	210.66	214.57	254.29	679.52
1998	79,884.31	88,115.43	107,367.66	275,367.40	360.00	221.90	244.77	298.24	764.91
1999	78,449.50	87,740.46	101,147.52	267,337.48	366.00	214.34	239.73	276.36	730.43
2000	62,339.31	86,925.74	107,376.09	256,641.13					

Graph F7: Manufacturing Census G

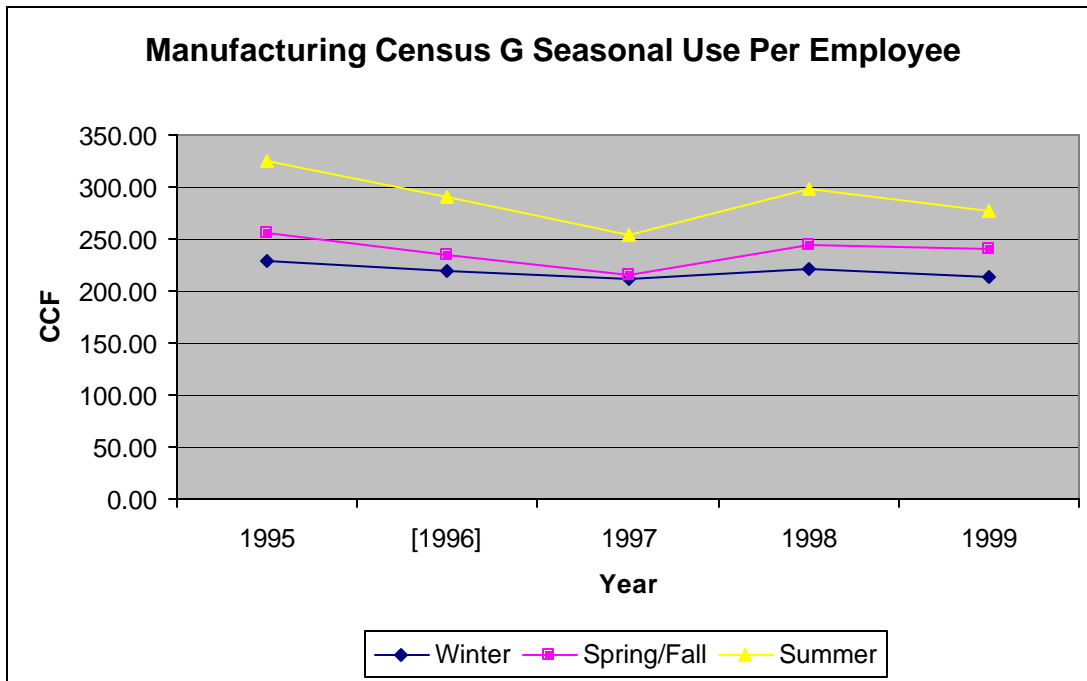


Table F9: Manufacturing Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	290,069.45	314,493.98	529,829.32	1,134,392.74					
1992	577,927.52	670,671.52	723,833.97	1,972,433.00					
1993	561,127.31	654,711.74	746,313.60	1,962,152.65					
1994	571,507.69	672,935.87	772,446.07	2,016,889.64					
1995	564,352.51	652,502.12	753,750.90	1,970,605.52	6,566.00	85.95	99.38	114.80	300.12
[1996]	576,563.41	645,745.59	733,255.92	1,955,564.93		85.95	97.77	111.48	295.20
1997	555,261.19	621,218.24	698,694.79	1,875,174.23	6,460.00	85.95	96.16	108.16	290.27
1998	539,537.25	647,218.73	690,307.51	1,877,063.50	6,763.00	79.78	95.70	102.07	277.55
1999	569,496.67	616,667.27	703,987.53	1,890,151.48	6,278.00	90.71	98.23	112.14	301.08
2000	426,281.56	636,659.86	727,711.91	1,790,653.33					

Graph F8: Manufacturing Census H

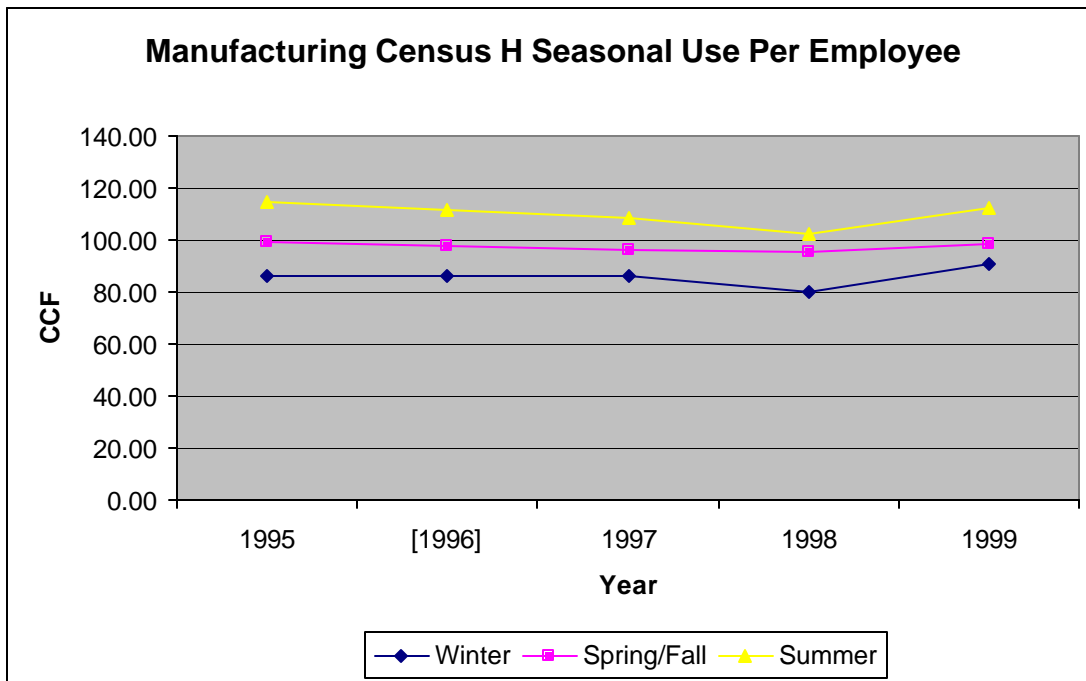


Table F10: Manufacturing Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
1991	118,092.08	161,371.90	294,346.20	573,810.19					
1992	271,050.43	275,688.16	286,091.61	832,830.20					
1993	255,971.15	280,622.45	312,841.97	849,435.57					
1994	256,381.53	280,834.33	302,942.11	840,157.98					
1995	254,156.89	275,546.28	307,393.11	837,096.28	9,631.00	26.39	28.61	31.92	86.92
[1996]	242,745.92	266,264.75	280,066.16	789,076.83		25.75	27.43	30.43	83.61
1997	231,243.32	241,582.60	266,523.39	739,349.31	9,206.00	25.12	26.24	28.95	80.31
1998	231,618.26	239,152.01	263,285.45	734,055.73	8,779.00	26.38	27.24	29.99	83.61
1999	232,642.96	250,936.89	272,291.41	755,871.26	8,068.00	28.84	31.10	33.75	93.69
2000	192,054.49	248,011.69	274,318.75	714,384.93					

Graph F9: Manufacturing Census I

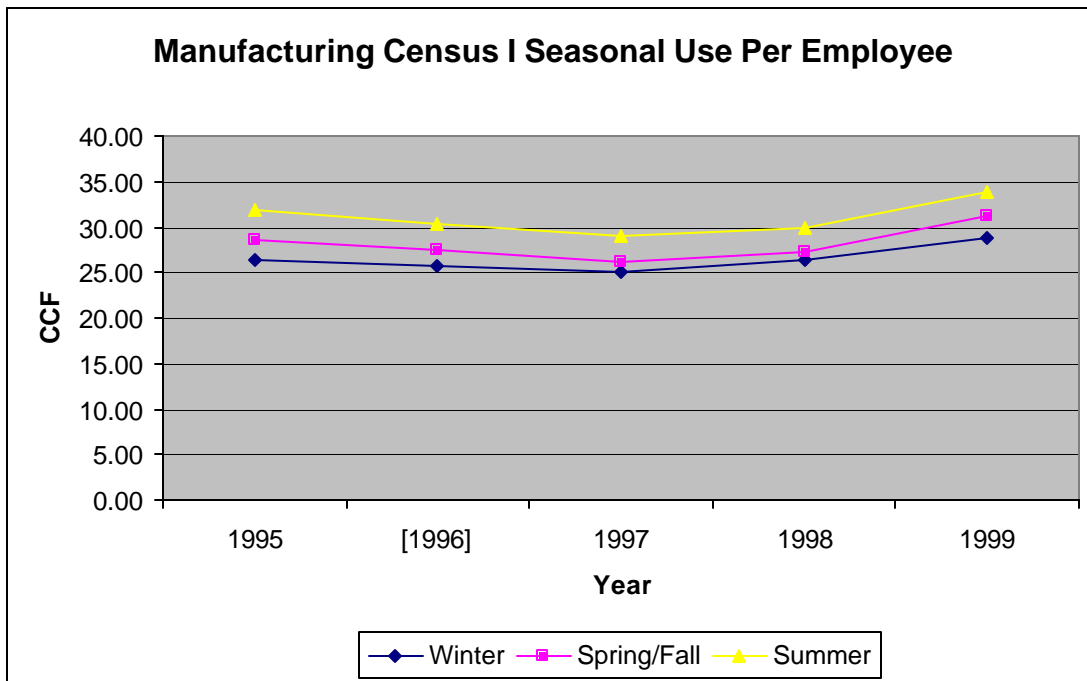


Table F11: Manufacturing Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	28,217.80	34,461.53	60,916.33	123,595.65					
1992	64,605.75	66,105.16	68,579.67	199,290.58					
1993	59,273.52	63,813.06	72,112.71	195,199.29					
1994	55,288.15	61,097.54	75,466.56	191,852.25					
1995	60,010.87	65,763.97	69,758.87	195,533.71	2,154.00	27.86	30.53	32.39	90.78
[1996]	56,324.59	57,163.90	66,613.68	180,102.17		26.40	28.57	30.87	85.83
1997	55,847.08	59,565.75	65,705.73	181,118.56	2,239.00	24.94	26.60	29.35	80.89
1998	54,414.40	59,689.40	70,395.45	184,499.24	1,974.00	27.57	30.24	35.66	93.46
1999	53,698.71	58,725.16	70,680.41	183,104.28	2,060.00	26.07	28.51	34.31	88.89
2000	43,924.27	60,015.75	71,797.24	175,737.26					

Graph F10: Manufacturing Census J

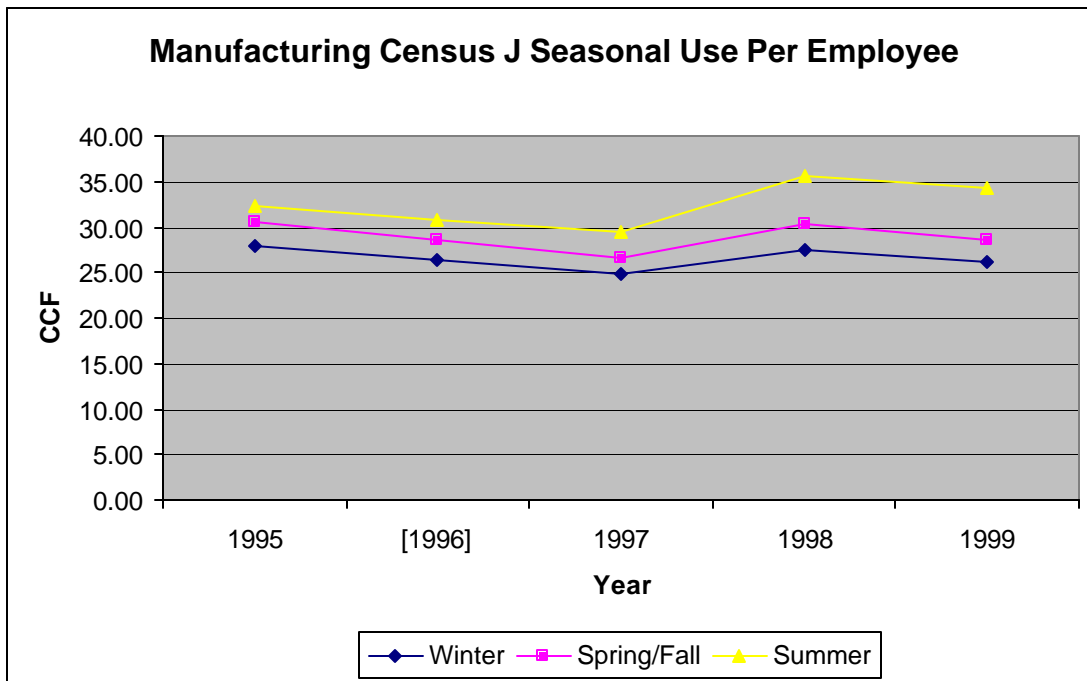
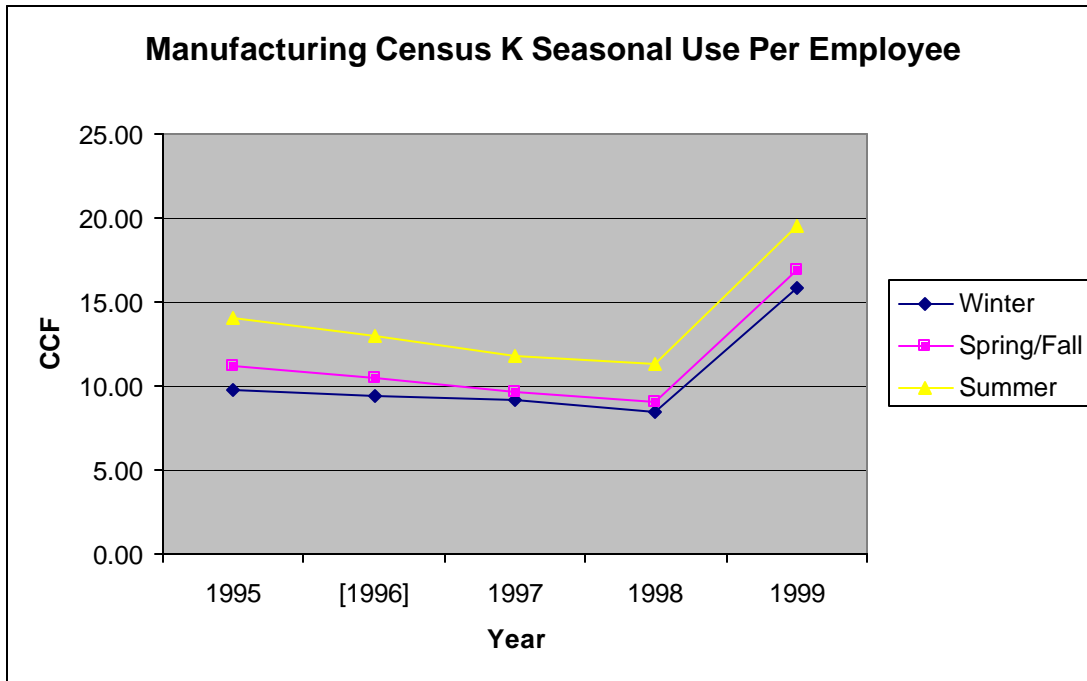


Table F12: Manufacturing Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	38,349.81	52,064.59	96,541.84	186,956.24					
1992	88,680.98	100,110.64	120,698.26	309,489.88					
1993	89,077.83	95,687.74	115,454.80	300,220.37					
1994	83,591.48	103,706.13	120,228.91	307,526.52					
1995	78,346.20	89,902.61	113,290.32	281,539.13	8,040.00	9.74	11.18	14.09	35.02
[1996]	80,491.01	87,731.41	106,165.21	274,387.63		9.43	10.43	12.92	32.78
1997	82,407.46	87,553.17	106,194.90	276,155.53	9,043.00	9.11	9.68	11.74	30.54
1998	88,463.08	95,108.60	117,566.19	301,137.87	10,445.00	8.47	9.11	11.26	28.83
1999	94,605.45	101,027.54	116,412.11	312,045.10	5,969.00	15.85	16.93	19.50	52.28
2000	76,833.20	100,654.13	120,256.52	297,743.85					

Graph F11: Manufacturing Census K



Appendix G: Retail Totals and Grouped Census

NOTE: 1996 is an average of 1995 and 1997 created as an assumption of the missing employment data. All table data and graph data that was assumed are noted with [1996].

Table G1: Retail Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
					Per Employee/Per Season				
1991	223,710.04	254,155.28	461,262.97	939,128.28					
1992	476,932.51	532,465.85	566,996.92	1,576,395.27					
1993	474,650.28	549,378.10	610,307.40	1,634,335.78					
1994	480,284.39	560,070.11	640,146.20	1,680,500.70					
1995	493,613.94	563,020.28	666,194.79	1,722,829.01	57,603.00	8.57	9.77	11.57	29.91
[1996]	493,713.34	555,690.38	645,851.55	1,695,255.26		8.36	9.47	11.03	28.86
1997	494,919.44	555,987.81	637,207.67	1,688,114.92	60,680.00	8.16	9.16	10.50	27.82
1998	501,892.22	586,279.82	654,190.76	1,742,362.80	62,887.00	7.98	9.32	10.40	27.71
1999	507,330.54	558,173.12	636,643.10	1,702,146.77	66,800.00	7.59	8.36	9.53	25.48
2000	421,491.62	596,441.22	678,650.79	1,696,583.62					

Table G2: Retail Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	1,929.21	2,353.52	4,025.32	8,308.06					
1992	4,525.48	4,752.96	4,662.77	13,941.21					
1993	4,710.41	5,388.08	5,249.84	15,348.33					
1994	7,684.99	7,143.61	7,917.95	22,746.54					
1995	12,347.26	12,628.61	9,283.68	34,259.55	3,269.00	3.78	3.86	2.84	10.48
[1996]	7,950.98	9,131.58	10,020.75	27,103.31		3.02	3.11	2.70	8.83
1997	9,656.71	10,073.00	10,906.62	30,636.33	4,265.00	2.26	2.36	2.56	7.18
1998	9,802.19	10,289.07	11,203.76	31,295.02	4,115.00	2.38	2.50	2.72	7.61
1999	10,169.78	10,645.16	11,173.15	31,988.09	3,965.00	2.56	2.68	2.82	8.07
2000	8,493.24	11,886.69	13,363.63	33,743.56					

Graph G1: Retail Census A

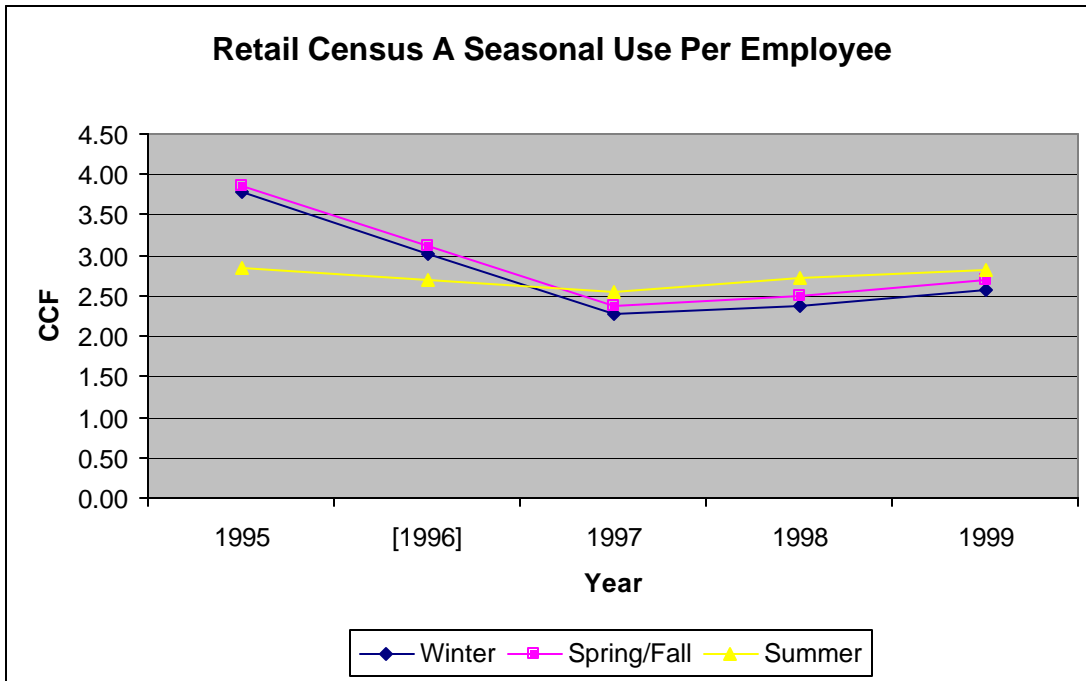


Table G3: Retail Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
1991	760.87	884.94	1,428.64	3,074.46					
1992	2,434.56	2,023.64	2,799.92	7,258.12					
1993	2,746.52	2,870.32	2,900.01	8,516.84					
1994	3,066.55	3,521.31	3,807.89	10,395.75					
1995	3,875.28	3,806.53	4,042.05	11,723.86	4,561.00	0.85	0.83	0.89	2.57
[1996]	4,176.79	3,987.44	4,204.20	12,368.43		0.86	0.85	0.89	2.61
1997	3,940.83	3,956.60	4,051.25	11,948.68	4,526.00	0.87	0.87	0.90	2.64
1998	4,416.37	4,613.49	4,303.11	13,332.97	4,570.00	0.97	1.01	0.94	2.92
1999	4,176.02	4,081.83	4,047.05	12,304.90	4,354.00	0.96	0.94	0.93	2.83
2000	3,440.50	5,552.87	5,682.61	14,675.98					

Graph G2: Retail Census B

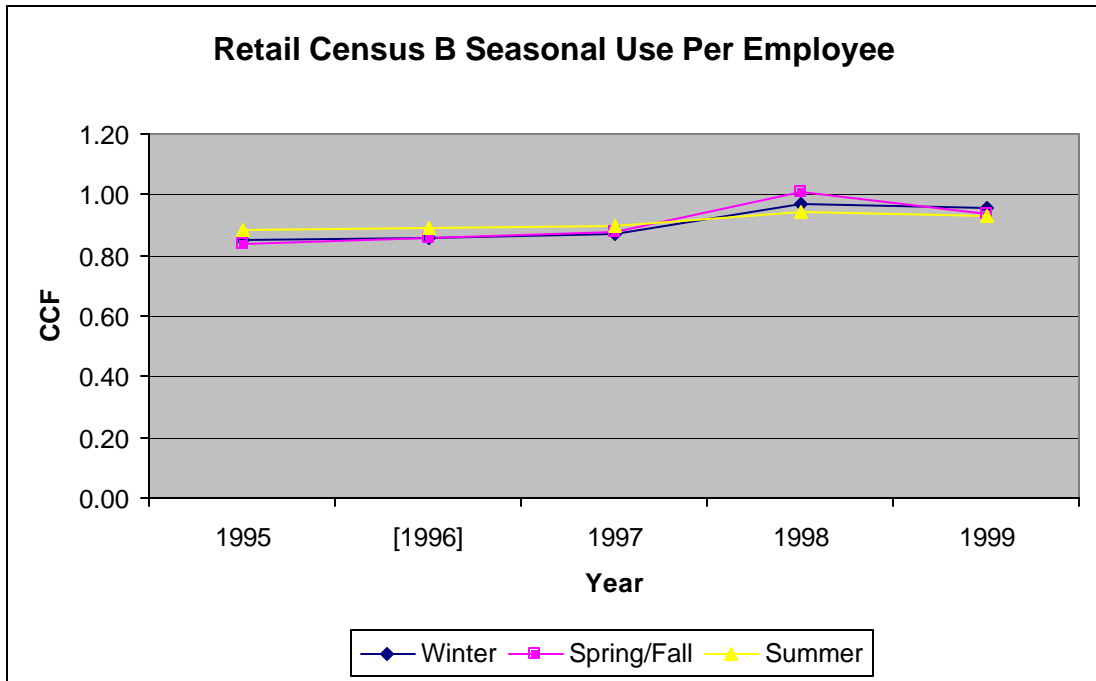


Table G4: Retail Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	5,575.59	7,022.50	13,430.61	26,028.70					
1992	14,006.87	13,410.54	13,065.93	40,483.34					
1993	14,100.04	14,746.49	15,379.92	44,226.45					
1994	14,861.84	15,980.43	18,021.34	48,863.62					
1995	14,741.71	15,629.66	18,038.80	48,410.18	3,969.00	3.71	3.94	4.54	12.20
[1996]	15,588.05	15,336.16	15,870.87	46,795.08		3.85	4.10	4.45	12.40
1997	16,348.78	17,421.43	17,836.21	51,606.42	4,094.00	3.99	4.26	4.36	12.61
1998	16,320.37	17,211.19	18,863.39	52,394.96	4,067.00	4.01	4.23	4.64	12.88
1999	16,378.98	16,632.85	18,431.36	51,443.20	3,906.00	4.19	4.26	4.72	13.17
2000	13,418.71	17,442.01	19,901.33	50,762.06					

Graph G3: Retail Census C

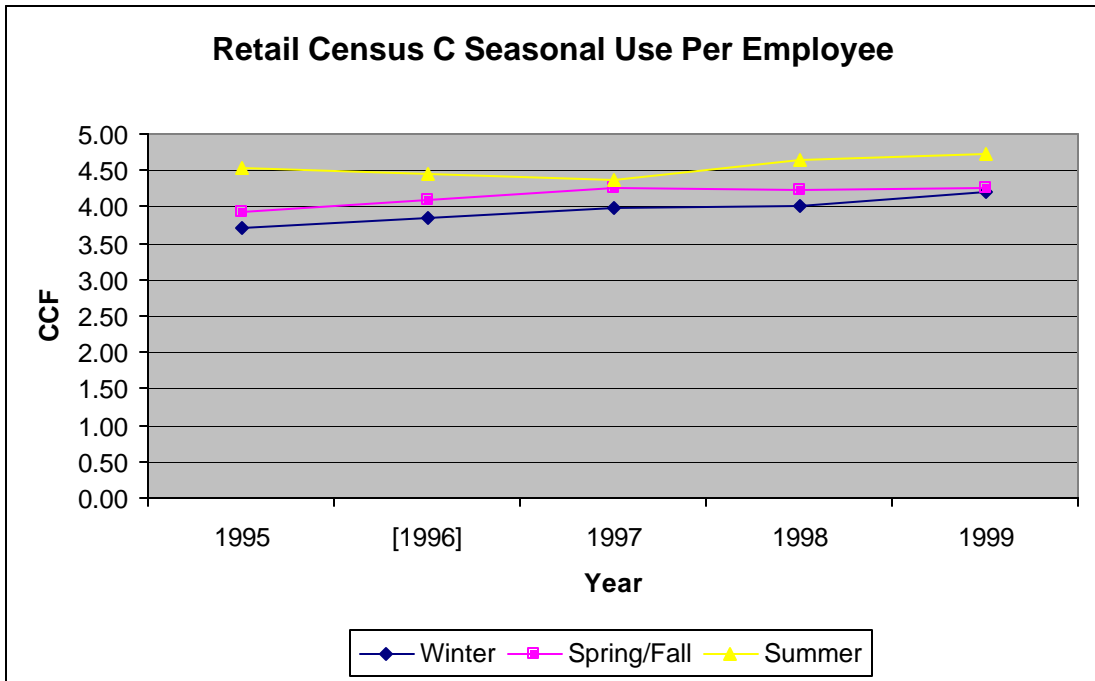


Table G5: Retail Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	6,605.49	8,568.24	14,750.18	29,923.91					
1992	14,750.56	15,385.21	15,553.54	45,689.31					
1993	14,966.76	15,284.22	16,142.21	46,393.19					
1994	15,644.99	16,525.60	18,520.74	50,691.33					
1995	17,203.88	17,232.75	18,436.35	52,872.98	4,121.00	4.17	4.18	4.47	12.83
[1996]	18,166.89	19,515.52	21,254.14	58,936.55		4.78	4.75	5.06	14.59
1997	21,077.95	20,820.41	22,152.27	64,050.63	3,917.00	5.38	5.32	5.66	16.35
1998	24,057.03	24,830.99	26,878.20	75,766.22	4,363.00	5.51	5.69	6.16	17.37
1999	24,819.81	25,384.65	27,043.00	77,247.45	4,433.00	5.60	5.73	6.10	17.43
2000	21,846.82	27,365.57	29,747.03	78,959.42					

Graph G4: Retail Census D

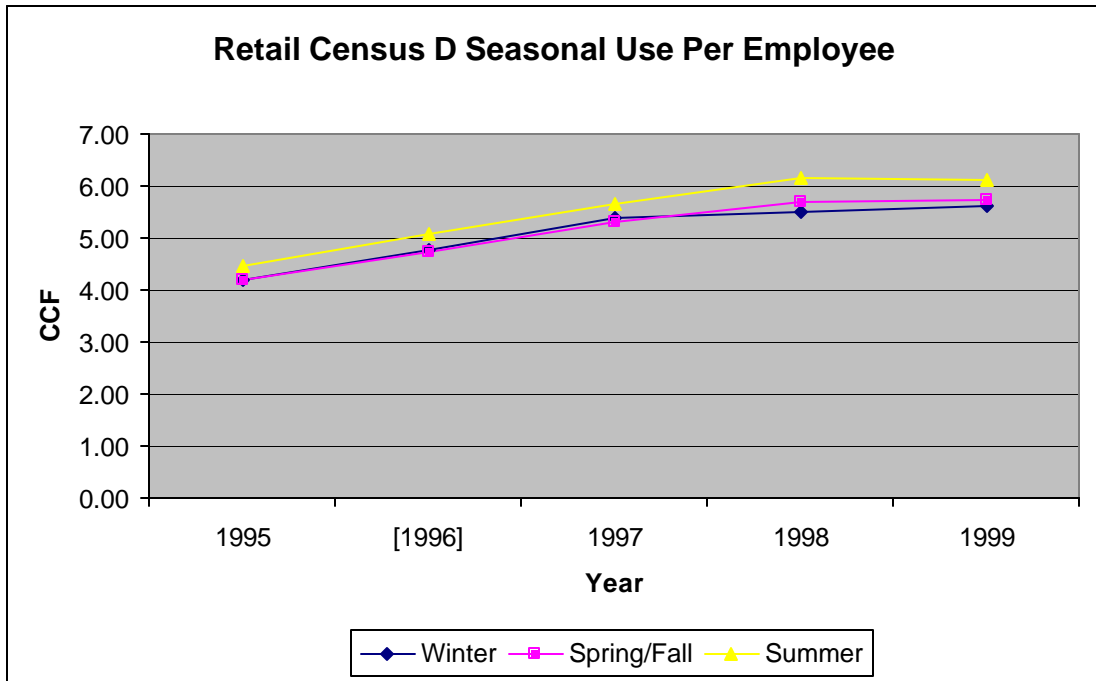


Table G6: Retail Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	2,163.26	2,710.66	4,894.91	9,768.83					
1992	4,980.97	4,866.30	5,349.80	15,197.08					
1993	5,270.55	5,439.36	5,324.80	16,034.70					
1994	6,068.36	5,945.96	6,481.90	18,496.22					
1995	6,325.10	6,426.74	6,797.47	19,549.31	4,164.00	1.52	1.54	1.63	4.69
[1996]	6,554.67	6,504.70	6,778.49	19,837.86		1.53	1.54	1.67	4.75
1997	6,893.81	6,860.56	7,642.63	21,397.00	4,453.00	1.55	1.54	1.72	4.81
1998	6,637.59	7,335.31	7,728.35	21,701.25	4,145.00	1.60	1.77	1.86	5.24
1999	6,779.28	7,439.21	7,731.02	21,949.51	4,599.00	1.47	1.62	1.68	4.77
2000	6,282.62	7,892.33	9,430.29	23,605.24					

Graph G5: Retail Census E

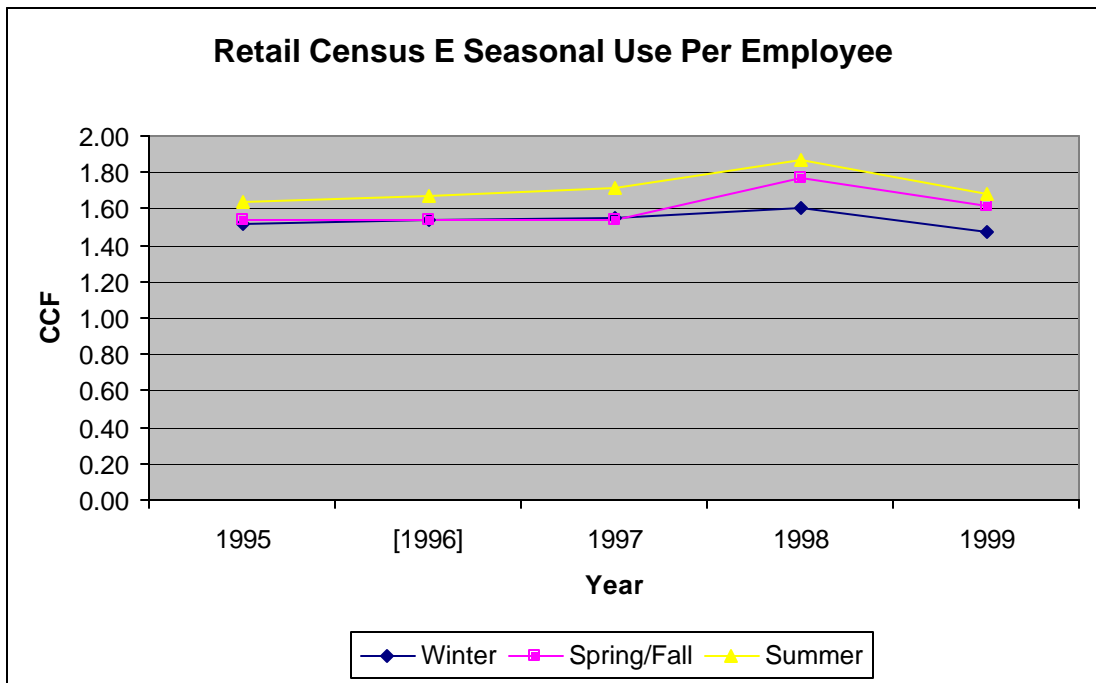


Table G7: Retail Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	11,832.29	16,374.37	30,177.51	58,384.17					
1992	27,258.15	28,309.14	27,450.37	83,017.66					
1993	28,267.17	35,282.99	37,804.11	101,354.27					
1994	32,743.20	37,647.95	37,914.57	108,305.71					
1995	33,744.42	40,113.26	45,572.12	119,429.80	4,284.00	7.88	9.36	10.64	27.88
[1996]	37,189.91	41,053.19	45,481.96	123,725.06		7.75	8.93	10.15	26.83
1997	35,890.72	39,968.56	45,521.84	121,381.13	4,708.00	7.62	8.49	9.67	25.78
1998	34,306.89	42,703.14	47,349.07	124,359.09	4,598.00	7.46	9.29	10.30	27.05
1999	32,787.81	39,081.12	43,596.22	115,465.15	4,773.00	6.87	8.19	9.13	24.19
2000	26,953.60	37,034.92	49,427.42	113,415.94					

Graph G6: Retail Census F

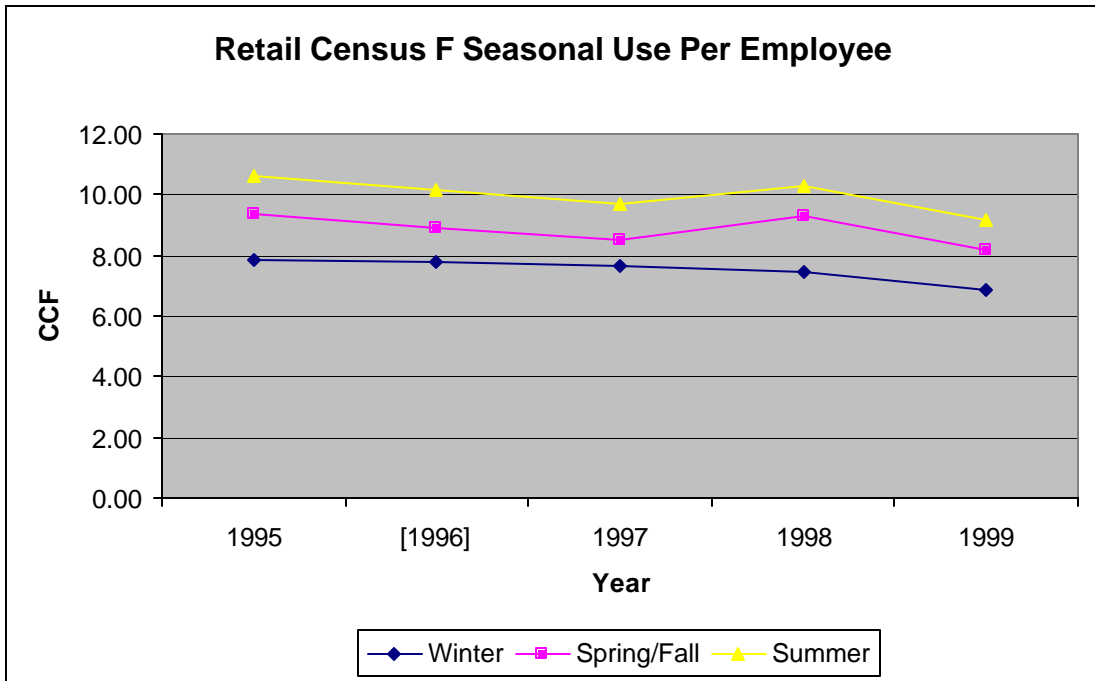


Table G8: Retail Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	5,196.09	6,219.75	10,524.79	21,940.63					
1992	12,660.06	12,767.30	12,305.38	37,732.74					
1993	14,160.46	15,842.90	16,489.15	46,492.51					
1994	15,991.03	16,259.12	17,437.79	49,687.95					
1995	15,761.01	16,310.11	18,303.28	50,374.40	3,588.00	4.39	4.55	5.10	14.04
[1996]	16,081.74	17,335.18	19,057.50	52,474.42		4.58	4.63	5.09	14.30
1997	16,834.85	16,659.57	17,883.30	51,377.72	3,528.00	4.77	4.72	5.07	14.56
1998	16,644.07	17,931.72	19,068.18	53,643.96	3,398.00	4.90	5.28	5.61	15.79
1999	16,672.73	17,273.07	18,209.26	52,155.07	3,874.00	4.30	4.46	4.70	13.46
2000	12,393.30	17,683.77	18,898.53	48,975.60					

Graph G7: Retail Census G

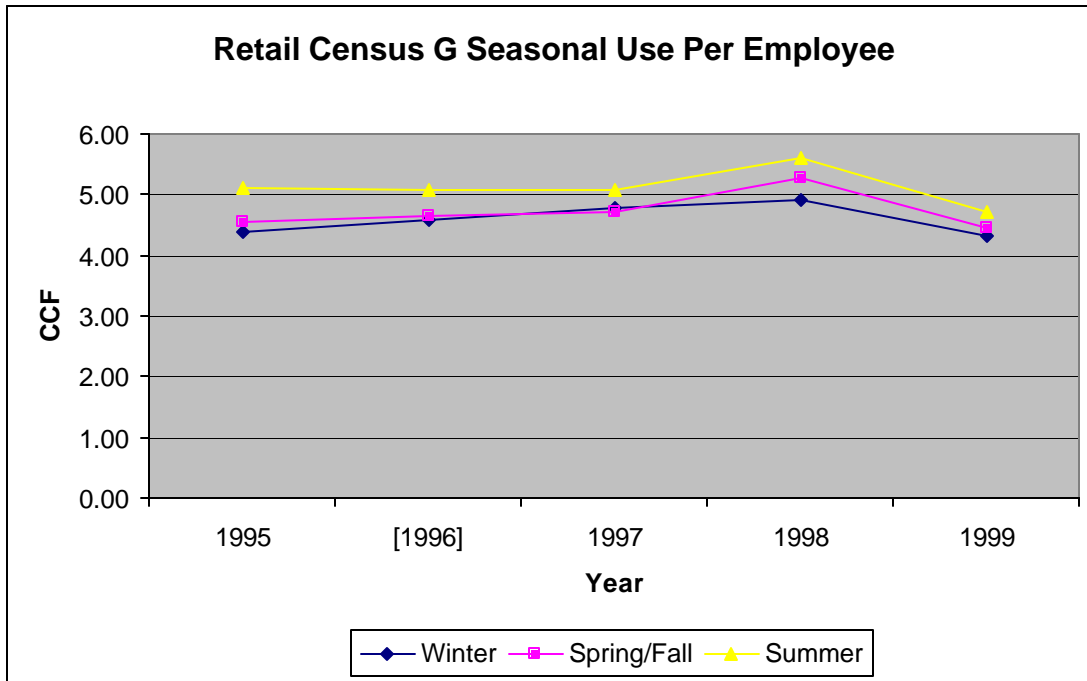


Table G9: Retail Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
1991	123,860.51	126,318.14	224,671.78	474,850.43					
1992	240,945.71	291,621.57	321,343.87	853,911.15					
1993	239,439.73	281,805.89	325,447.98	846,693.60					
1994	235,450.22	286,721.28	331,480.55	853,652.05					
1995	243,971.90	287,393.97	350,714.83	882,080.71	16,127.00	15.13	17.82	21.75	54.70
[1996]	241,844.06	281,653.40	337,935.35	861,432.82		20.26	23.97	28.29	72.52
1997	244,247.72	289,785.80	335,209.23	869,242.75	9,622.00	25.38	30.12	34.84	90.34
1998	260,617.57	306,017.40	339,839.04	906,474.01	17,683.00	14.74	17.31	19.22	51.26
1999	265,691.02	294,301.86	327,893.84	887,886.72	19,063.00	13.94	15.44	17.20	46.58
2000	213,670.08	310,676.25	348,984.73	873,331.06					

Graph G8: Retail Census H

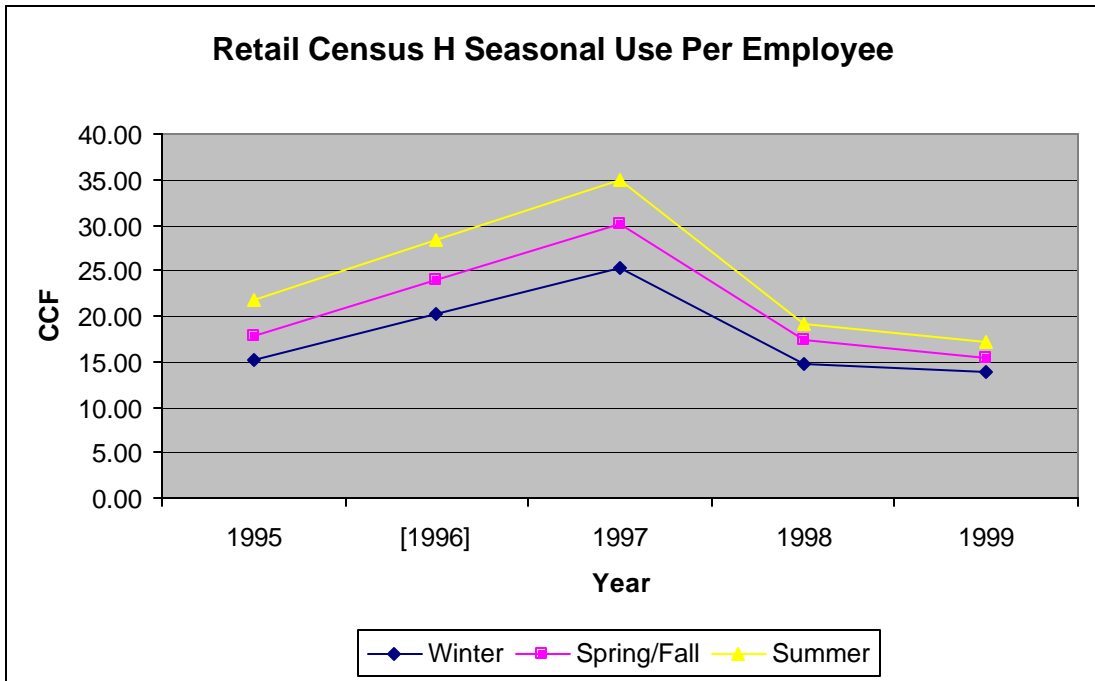


Table G10: Retail Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
1991	25,832.71	30,508.70	55,459.08	111,800.48					
1992	59,836.94	62,648.21	61,145.44	183,630.59					
1993	62,243.32	64,962.04	71,013.35	198,218.71					
1994	58,804.90	59,617.95	69,563.10	187,985.95					
1995	55,383.46	62,488.16	69,309.13	187,180.75	8,277.00	6.69	7.55	8.37	22.61
[1996]	57,337.01	61,222.56	64,638.65	183,198.22		6.31	6.78	7.42	20.52
1997	57,065.64	57,833.78	62,297.53	177,196.95	9,622.00	5.93	6.01	6.47	18.42
1998	52,100.69	59,349.95	63,699.99	175,150.63	10,782.00	4.83	5.50	5.91	16.24
1999	52,475.12	57,667.35	65,117.23	175,259.70	12,488.00	4.20	4.62	5.21	14.03
2000	47,803.54	61,652.14	67,782.22	177,237.89					

Graph G9: Retail Census I

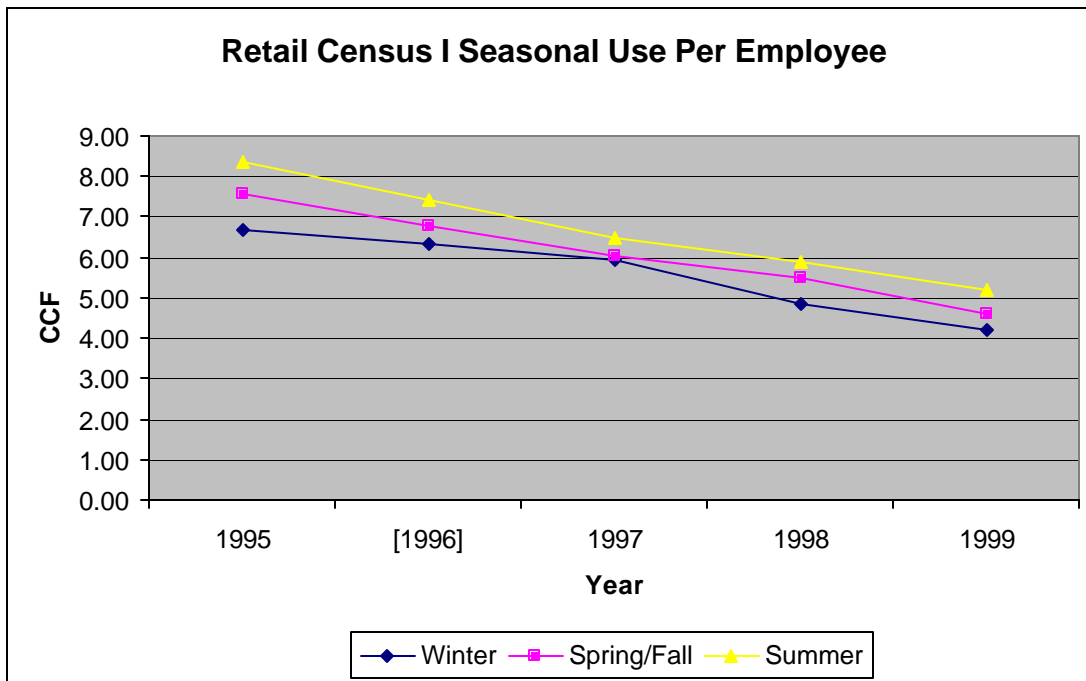


Table G11: Retail Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
1991	5,788.60	8,266.40	14,106.19	28,161.20					
1992	14,201.01	14,930.74	13,409.14	42,540.89					
1993	17,585.73	18,200.84	19,778.17	55,564.74					
1994	13,951.63	15,443.41	19,464.60	48,859.64					
1995	11,136.08	12,187.57	16,226.54	39,550.19	2,920.00	3.81	4.17	5.56	13.54
[1996]	16,168.80	17,508.50	18,025.38	51,702.69		4.72	5.04	6.73	16.49
1997	15,922.32	16,746.69	22,390.84	55,059.86	2,834.00	5.62	5.91	7.90	19.43
1998	19,058.25	19,808.08	23,799.68	62,666.01	2,911.00	6.55	6.80	8.18	21.53
1999	17,550.84	16,185.30	22,039.82	55,775.95	3,167.00	5.54	5.11	6.96	17.61
2000	12,822.25	19,182.24	22,757.36	54,761.84					

Graph G10: Retail Census J

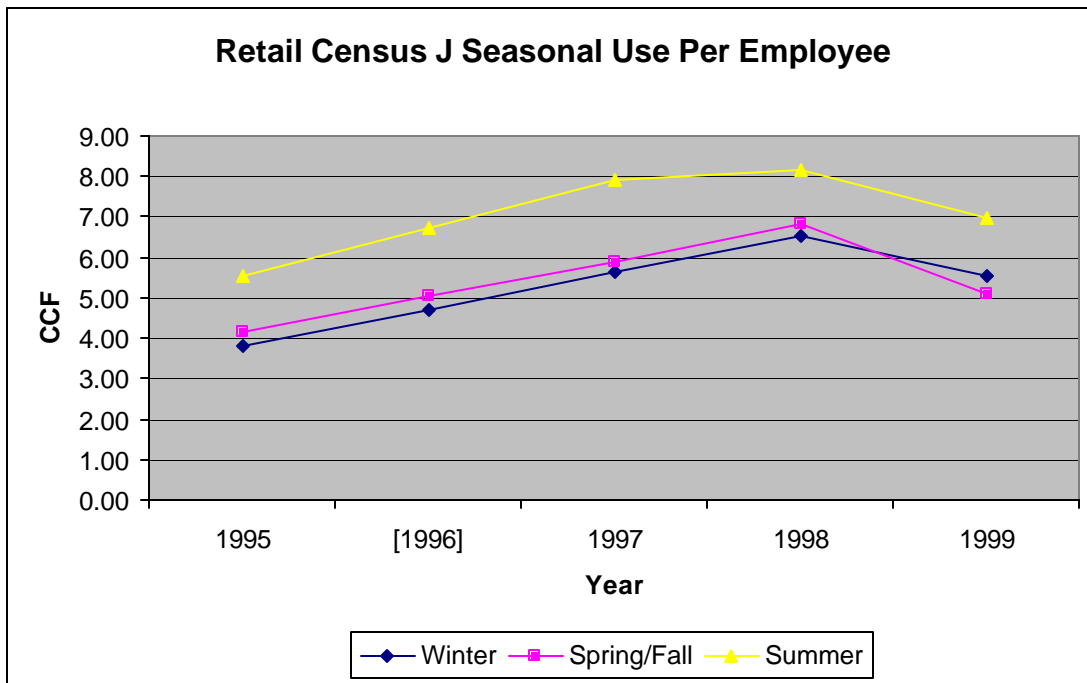
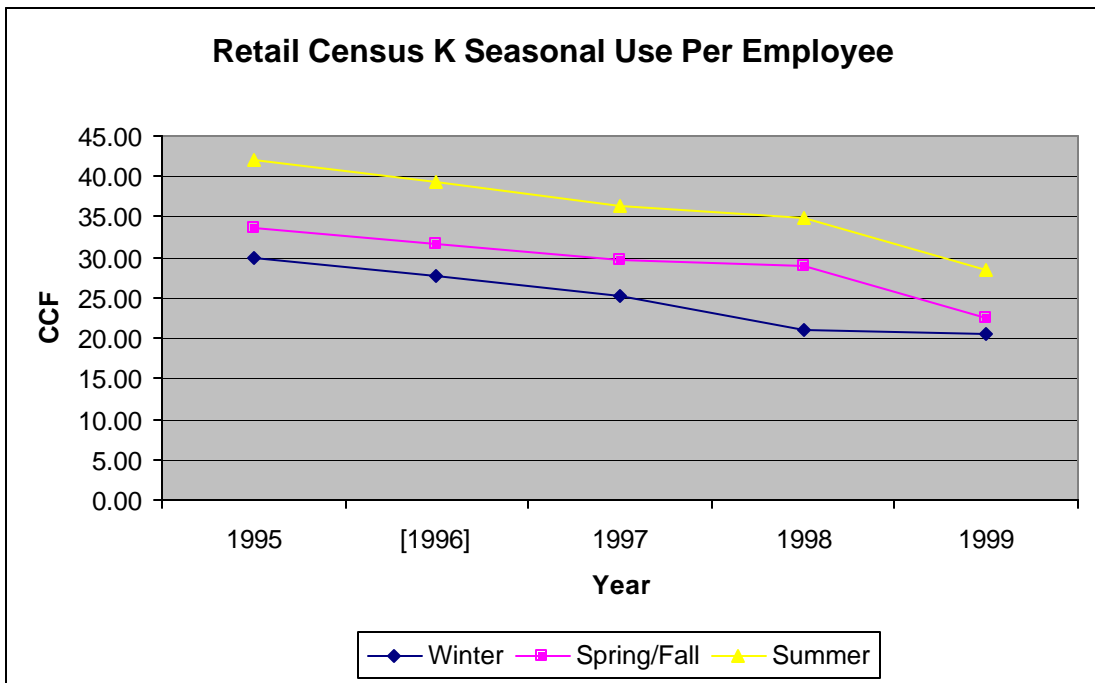


Table G12: Retail Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	30,482.08	39,849.08	76,666.22	146,997.37					
1992	71,657.22	72,576.26	81,374.51	225,607.99					
1993	61,880.50	81,175.27	86,005.73	229,061.49					
1994	67,017.12	86,196.55	98,810.38	252,024.06					
1995	69,658.70	78,363.35	97,928.96	245,951.01	2,323.00	29.99	33.73	42.16	105.88
[1996]	61,666.38	71,552.35	90,673.42	223,892.16		27.60	31.68	39.25	98.52
1997	55,536.10	65,262.40	80,053.91	200,852.40	2,203.00	25.21	29.62	36.34	91.17
1998	47,313.52	65,418.00	78,647.23	191,378.75	2,255.00	20.98	29.01	34.88	84.87
1999	44,550.27	49,113.77	61,808.97	155,473.00	2,178.00	20.45	22.55	28.38	71.38
2000	36,255.81	55,448.42	59,337.80	151,042.03					

Graph G 11: Retail Census K



Appendix H: Service Totals and Grouped Census

NOTE: 1996 is an average of 1995 and 1997 created as an assumption of the missing employment data. All table data and graph data that was assumed are noted with [1996].

Table H1: Service Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Writer	Spring/Fall	Summer	Per Employee
					Per Employee/Per Season				
1991	844,702.07	1,047,178.80	1,854,530.96	3,746,411.83					
1992	1,865,413.80	2,079,840.86	2,233,692.06	6,178,946.72					
1993	1,803,344.02	2,044,399.42	2,308,051.10	6,155,794.53					
1994	1,817,705.31	2,054,888.82	2,376,074.76	6,248,668.89					
1995	1,792,219.70	2,023,179.05	2,379,921.94	6,195,320.70	174,765.00	10.26	11.58	13.62	35.45
[1996]	1,804,829.92	1,958,896.42	2,253,016.14	6,016,742.48		9.79	10.86	12.59	33.24
1997	1,751,997.86	1,908,119.94	2,173,209.82	5,833,327.63	188,040.00	9.32	10.15	11.56	31.02
1998	1,736,396.86	1,944,152.35	2,203,738.40	5,884,287.62	194,213.00	8.94	10.01	11.35	30.30
1999	1,763,230.48	1,906,967.82	2,202,662.97	5,872,861.27	204,556.00	8.62	9.32	10.77	28.71
2000	1,391,676.47	1,909,813.60	2,276,835.15	5,578,325.22					

Table H2: Service Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	43,910.07	53,105.31	90,831.24	187,846.62					
1992	96,075.78	106,077.47	109,396.46	311,549.71					
1993	94,495.27	106,358.11	120,253.56	321,106.94					
1994	94,423.28	105,832.14	126,119.65	326,375.07					
1995	91,005.08	102,770.39	134,017.19	327,792.66	8,151.00	11.16	12.61	16.44	40.22
[1996]	94,354.01	99,303.16	122,753.88	316,411.05		10.95	12.12	15.15	38.22
1997	90,616.10	98,249.82	116,965.90	305,831.81	8,441.00	10.74	11.64	13.86	36.23
1998	90,176.35	100,823.29	120,241.35	311,240.99	8,999.00	10.02	11.20	13.36	34.59
1999	89,406.49	99,496.43	113,881.44	302,784.36	8,188.00	10.92	12.15	13.91	36.98
2000	63,614.88	91,243.87	114,646.38	269,505.12					

Graph H1: Service Census A

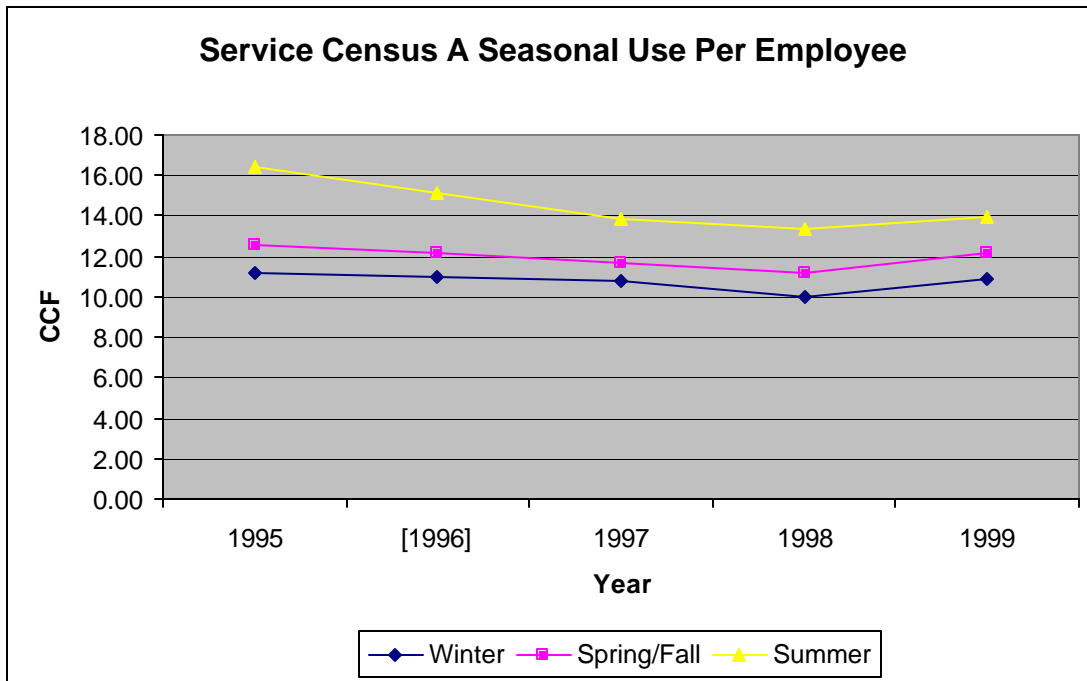


Table H3: Service Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	34,996.89	41,666.15	72,720.26	149,383.30					
1992	74,083.60	85,515.56	91,236.43	250,835.59					
1993	75,563.67	81,472.60	86,952.09	243,988.36					
1994	72,232.00	78,907.50	96,625.90	247,765.40					
1995	71,070.47	77,362.22	92,830.29	241,262.98	4,713.00	15.08	16.41	19.70	51.19
[1996]	71,062.51	75,353.68	88,538.82	234,955.01		14.85	15.93	18.85	49.63
1997	72,913.06	77,067.78	89,880.99	239,861.84	4,990.00	14.61	15.44	18.01	48.07
1998	72,519.15	76,876.26	84,634.31	234,029.72	5,134.00	14.13	14.97	16.49	45.58
1999	66,770.03	71,439.70	79,091.93	217,301.65	5,370.00	12.43	13.30	14.73	40.47
2000	47,575.61	69,165.26	83,753.51	200,494.38					

Graph H2: Service Census B

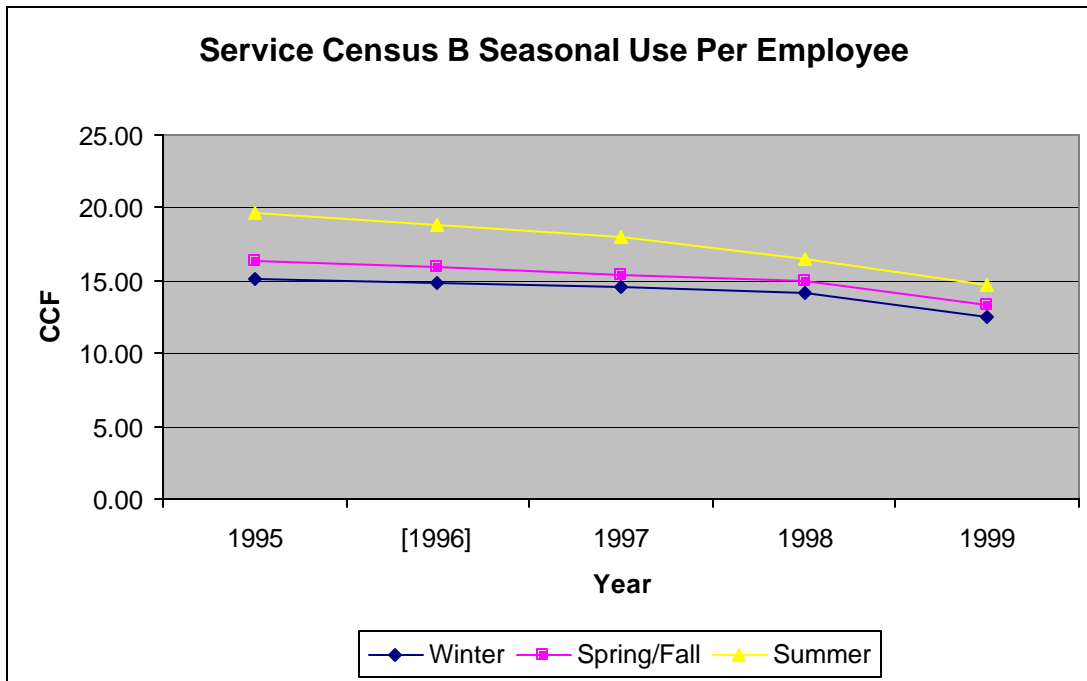


Table H4: Service Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	47,878.94	56,256.28	105,349.88	209,485.10					
1992	109,008.92	117,857.85	128,979.57	355,846.34					
1993	106,609.60	111,683.35	126,982.38	345,275.33					
1994	98,634.75	106,092.59	118,985.32	323,712.67					
1995	100,575.49	110,099.27	117,342.26	328,017.01	6,171.00	16.30	17.84	19.02	53.15
[1996]	105,846.88	101,498.60	112,452.71	319,798.19		16.32	17.82	19.31	53.45
1997	95,402.66	103,945.48	114,466.98	313,815.12	5,839.00	16.34	17.80	19.60	53.74
1998	92,842.76	97,760.68	111,968.91	302,572.35	5,742.00	16.17	17.03	19.50	52.69
1999	93,386.37	93,372.18	102,940.33	289,698.88	6,060.00	15.41	15.41	16.99	47.81
2000	74077.30	90346.18	104472.34	268895.81					

Graph H3: Service Census C

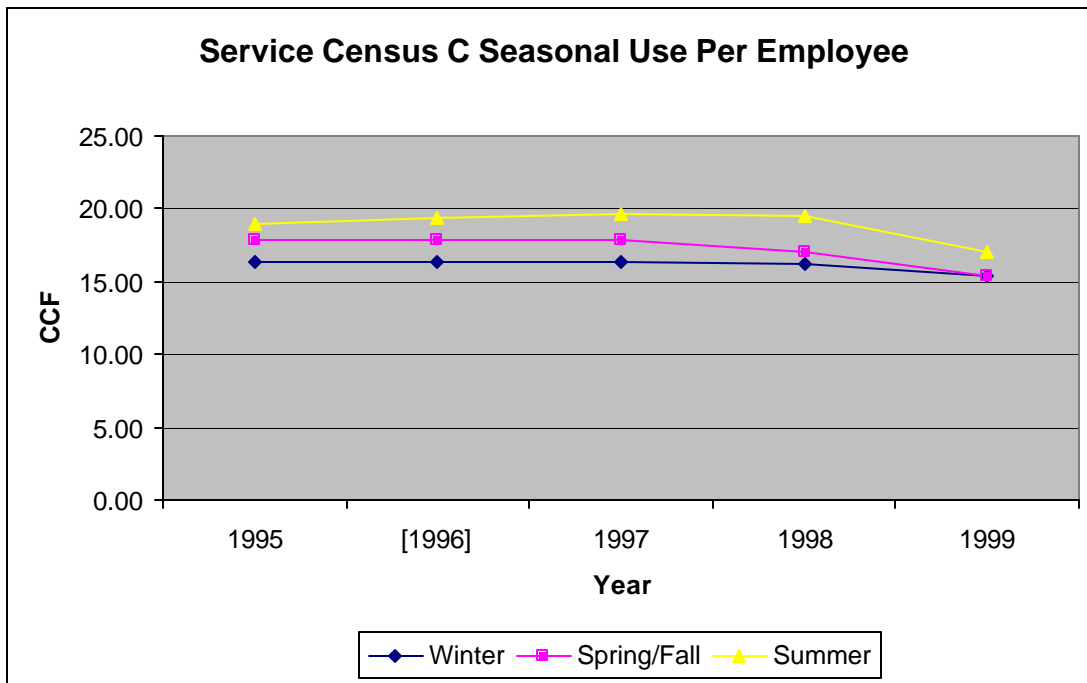


Table H5: Service Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	42,424.03	57,575.92	96,627.26	196,627.21					
1992	108,118.84	120,067.80	125,402.07	353,588.71					
1993	107,037.44	124,470.77	142,101.88	373,610.10					
1994	117,073.47	124,530.63	149,634.78	391,238.88					
1995	111,367.94	125,596.58	147,713.33	384,677.85	7,719.00	14.43	16.27	19.14	49.84
[1996]	113,638.23	125,714.89	143,370.28	382,723.40		13.46	14.99	17.07	45.53
1997	120,693.14	132,308.74	144,902.65	397,904.53	9,654.00	12.50	13.71	15.01	41.22
1998	119,442.34	131,589.76	140,118.74	391,150.84	10,255.00	11.65	12.83	13.66	38.14
1999	106,221.95	114,381.40	132,139.76	352,743.11	11,265.00	9.43	10.15	11.73	31.31
2000	83750.29	117522.16	141217.19	342489.64					

Graph H4: Service Census D

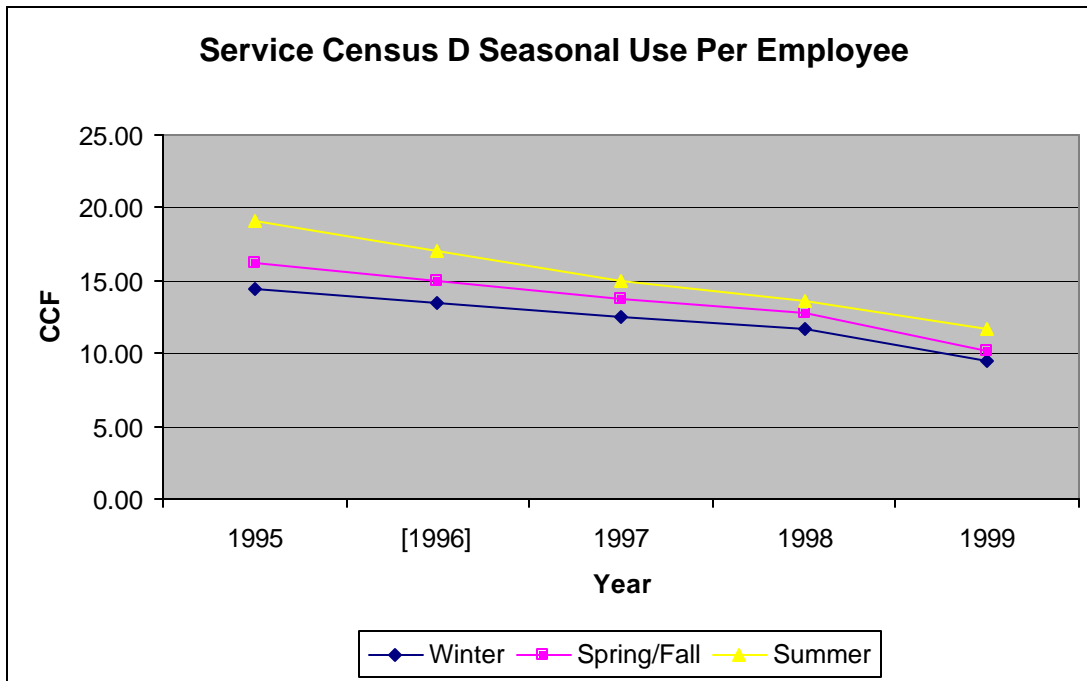


Table H6: Service Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	40,761.93	58,091.78	113,518.82	212,372.53					
1992	97,408.77	110,665.38	122,661.60	330,735.76					
1993	97,171.66	123,540.01	139,517.47	360,229.13					
1994	100,242.16	111,736.41	143,793.56	355,772.13					
1995	105,133.58	118,372.97	152,815.12	376,321.67	7,978.00	13.18	14.84	19.15	47.17
[1996]	95,775.76	110,545.54	141,875.29	348,196.59		12.55	14.19	17.57	44.32
1997	97,308.24	110,516.75	130,505.24	338,330.23	8,160.00	11.93	13.54	15.99	41.46
1998	98,673.15	112,634.26	145,105.83	356,413.23	8,462.00	11.66	13.31	17.15	42.12
1999	93,938.75	106,163.42	142,464.02	342,566.20	9,422.00	9.97	11.27	15.12	36.36
2000	86,071.39	108,475.96	150,507.75	345,055.10					

Graph H5: Service Census E

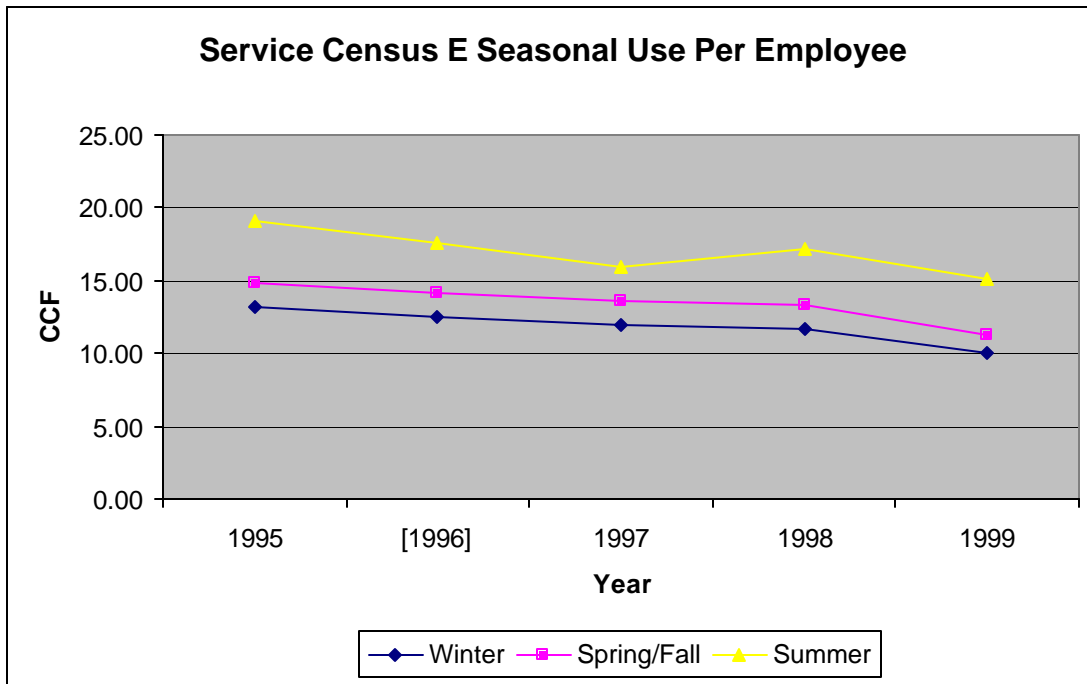


Table H7: Service Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	57,573.75	77,986.90	151,436.44	286,997.10					
1992	135,348.49	148,799.44	159,950.57	444,098.51					
1993	130,650.98	152,507.01	165,741.46	448,899.44					
1994	132,763.45	151,738.88	171,497.25	455,999.57					
1995	127,290.21	149,964.24	179,324.28	456,578.73	14,300.00	8.90	10.49	12.54	31.93
[1996]	135,901.68	146,809.72	183,170.54	465,881.94		9.07	10.26	12.31	31.64
1997	127,278.95	138,222.30	166,445.03	431,946.29	13,774.00	9.24	10.04	12.08	31.36
1998	126,627.69	145,937.08	176,413.77	448,978.55	15,657.00	8.09	9.32	11.27	28.68
1999	137,529.74	153,115.58	184,497.35	475,142.67	14,426.00	9.53	10.61	12.79	32.94
2000	122400.37	153881.63	195974.68	472256.67					

Graph H6: Service Census F

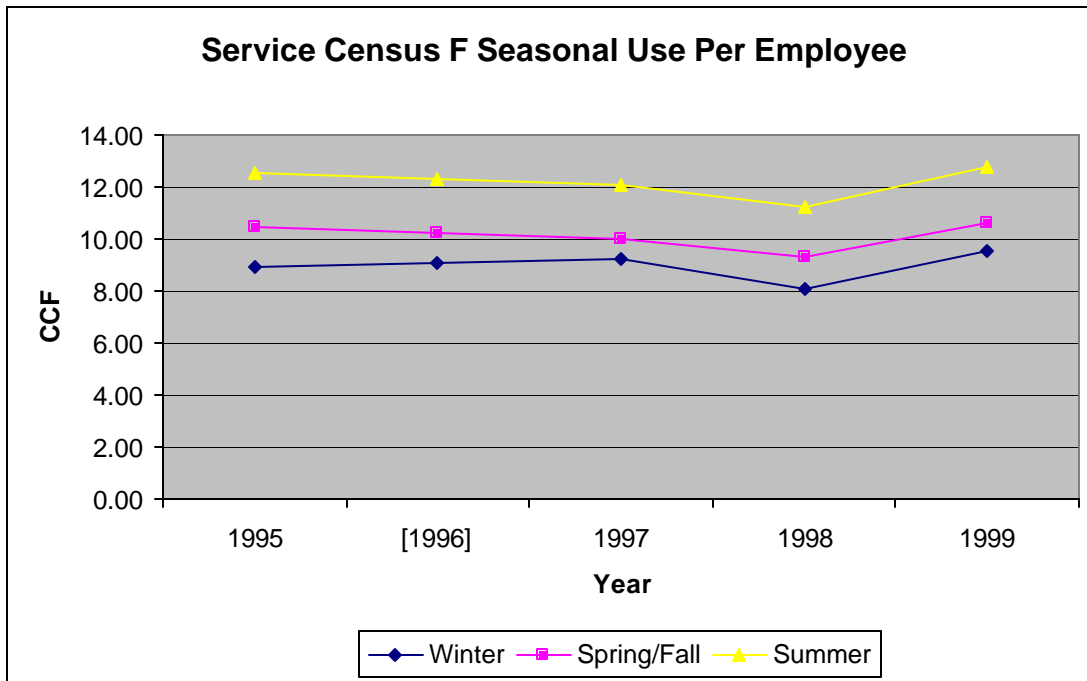


Table H8: Service Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	36,116.52	52,521.16	87,885.22	176,522.90					
1992	83,156.11	91,270.83	93,842.17	268,269.11					
1993	80,400.52	93,244.11	101,868.28	275,512.91					
1994	88,038.48	99,579.70	118,094.32	305,712.50					
1995	84,835.86	94,663.19	120,695.20	300,194.24	8,485.00	10.00	11.16	14.22	35.38
[1996]	83,572.94	94,107.74	106,515.32	284,195.99		9.36	10.02	12.38	31.76
1997	83,210.83	84,756.41	100,442.72	268,409.96	9,535.00	8.73	8.89	10.53	28.15
1998	79,884.31	88,115.43	107,367.66	275,367.40	9,066.00	8.81	9.72	11.84	30.37
1999	78,449.50	87,740.46	101,147.52	267,337.48	10,140.00	7.74	8.65	9.98	26.36
2000	62,339.31	86,925.74	107,376.09	256,641.13					

Graph H7: Service Census G

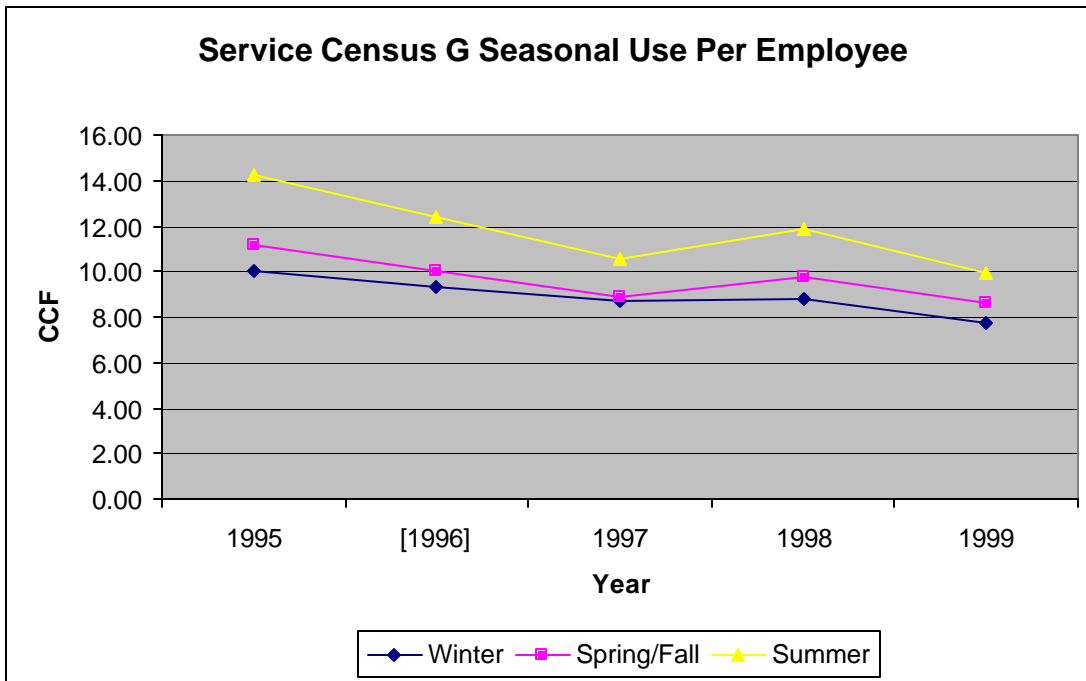


Table H9: Service Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	290,069.45	314,493.98	529,829.32	1,134,392.74					
1992	577,927.52	670,671.52	723,833.97	1,972,433.00					
1993	561,127.31	654,711.74	746,313.60	1,962,152.65					
1994	571,507.69	672,935.87	772,446.07	2,016,889.64					
1995	564,352.51	652,502.12	753,750.90	1,970,605.52	96,389.00	5.85	6.77	7.82	20.44
[1996]	576,563.41	645,745.59	733,255.92	1,955,564.93		5.61	6.39	7.29	19.29
1997	555,261.19	621,218.24	698,694.79	1,875,174.23	103,398.00	5.37	6.01	6.76	18.14
1998	539,537.25	647,218.73	690,307.51	1,877,063.50	106,116.00	5.08	6.10	6.51	17.69
1999	569,496.67	616,667.27	703,987.53	1,890,151.48	111,720.00	5.10	5.52	6.30	16.92
2000	426281.56	636659.86	727711.91	1790653.33					

Graph H8: Service Census H

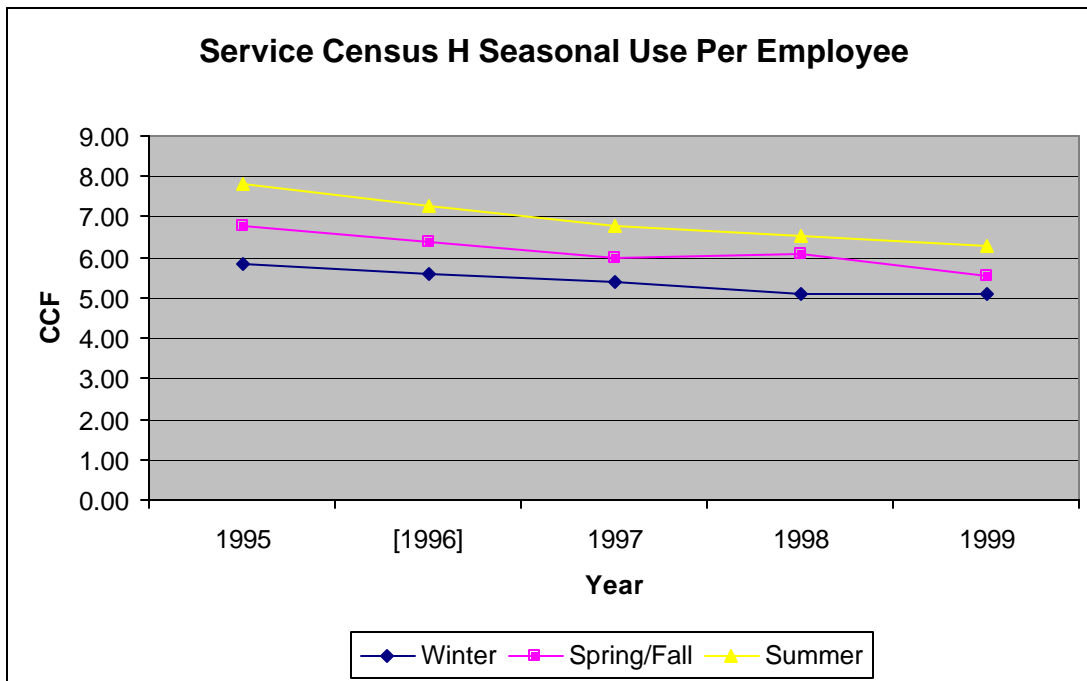


Table H10: Service Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	118,092.08	161,371.90	294,346.20	573,810.19					
1992	271,050.43	275,688.16	286,091.61	832,830.20					
1993	255,971.15	280,622.45	312,841.97	849,435.57					
1994	256,381.53	280,834.33	302,942.11	840,157.98					
1995	254,156.89	275,546.28	307,393.11	837,096.28	13,241.00	19.19	20.81	23.22	63.22
[1996]	242,745.92	266,264.75	280,066.16	789,076.83		17.68	18.85	20.92	57.44
1997	231,243.32	241,582.60	266,523.39	739,349.31	14,310.00	16.16	16.88	18.62	51.67
1998	231,618.26	239,152.01	263,285.45	734,055.73	14,735.00	15.72	16.23	17.87	49.82
1999	232,642.96	250,936.89	272,291.41	755,871.26	16,132.00	14.42	15.56	16.88	46.86
2000	192,054.49	248,011.69	274,318.75	714,384.93					

Graph H9: Service Census I

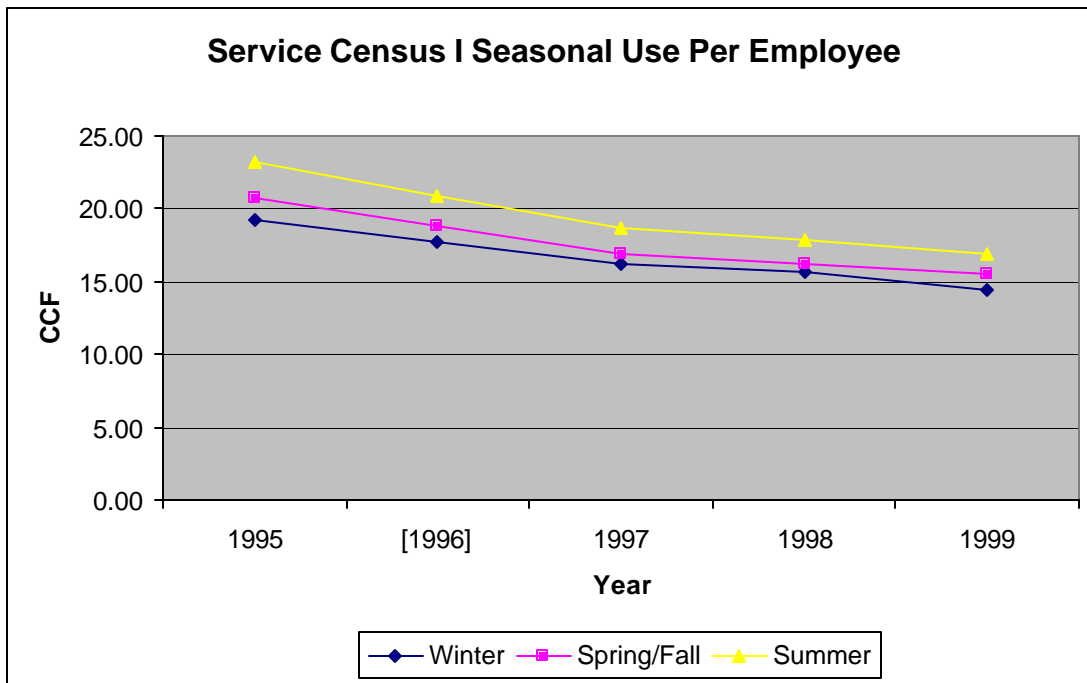


Table H11: Service Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	28,217.80	34,461.53	60,916.33	123,595.65					
1992	64,605.75	66,105.16	68,579.67	199,290.58					
1993	59,273.52	63,813.06	72,112.71	195,199.29					
1994	55,288.15	61,097.54	75,466.56	191,852.25					
1995	60,010.87	65,763.97	69,758.87	195,533.71	3,584.00	16.74	18.35	19.46	54.56
[1996]	56,324.59	57,163.90	66,613.68	180,102.17		13.94	15.12	16.29	45.35
1997	55,847.08	59,565.75	65,705.73	181,118.56	5,012.00	11.14	11.88	13.11	36.14
1998	54,414.40	59,689.40	70,395.45	184,499.24	6,868.00	7.92	8.69	10.25	26.86
1999	53,698.71	58,725.16	70,680.41	183,104.28	5,983.00	8.98	9.82	11.81	30.60
2000	43924.27	60015.75	71797.24	175737.26					

Graph H10: Service Census J

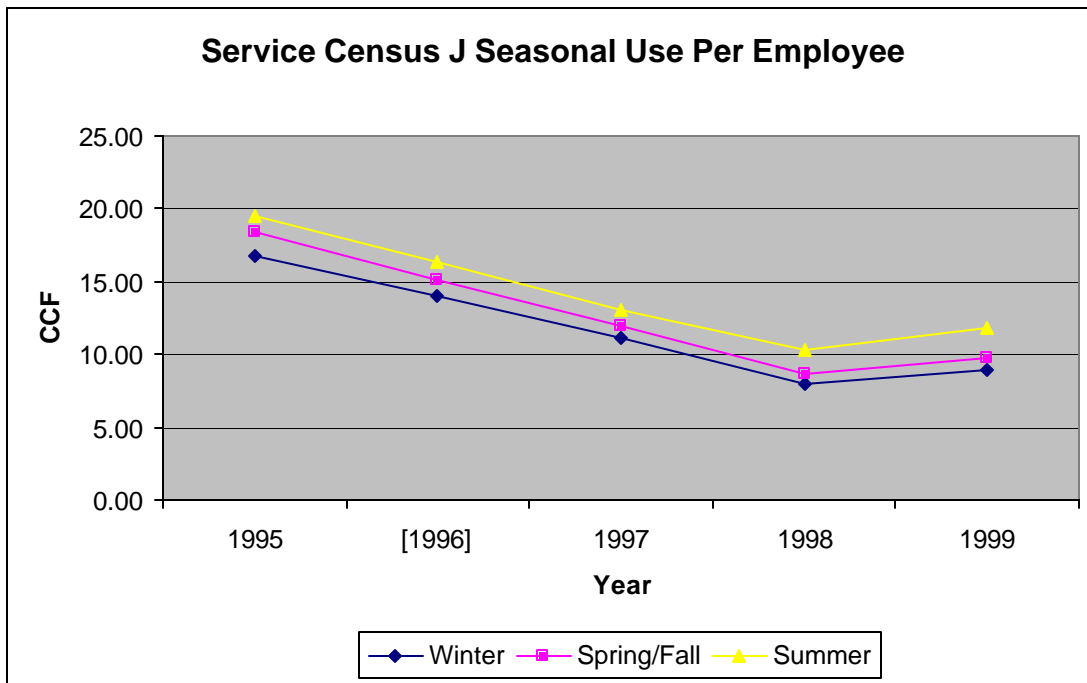
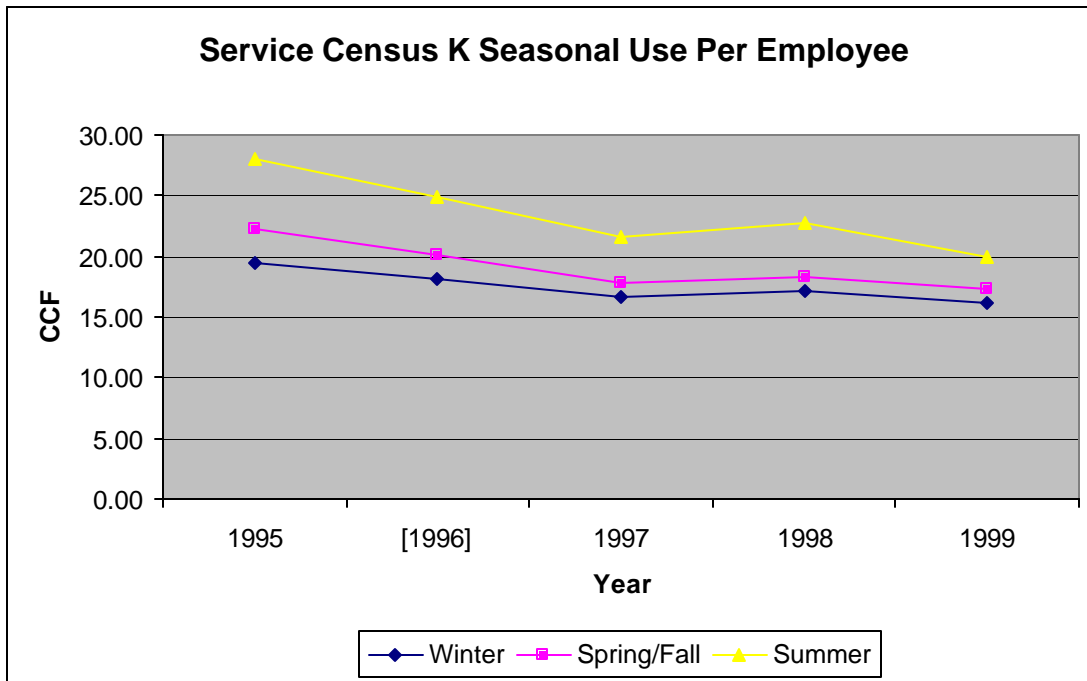


Table H12: Service Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	38,349.81	52,064.59	96,541.84	186,956.24					
1992	88,680.98	100,110.64	120,698.26	309,489.88					
1993	89,077.83	95,687.74	115,454.80	300,220.37					
1994	83,591.48	103,706.13	120,228.91	307,526.52					
1995	78,346.20	89,902.61	113,290.32	281,539.13	4,034.00	19.42	22.29	28.08	69.79
[1996]	80,491.01	87,731.41	106,165.21	274,387.63		18.07	20.03	24.82	62.92
1997	82,407.46	87,553.17	106,194.90	276,155.53	4,927.00	16.73	17.77	21.55	56.05
1998	88,463.08	95,108.60	117,566.19	301,137.87	5,179.00	17.08	18.36	22.70	58.15
1999	94,605.45	101,027.54	116,412.11	312,045.10	5,850.00	16.17	17.27	19.90	53.34
2000	76833.20	100654.13	120256.52	297743.85					

Graph H11: Service Census K



Appendix I: Warehouse, Utilities, Transportation & Communication (WUTC) Totals and Grouped Census

NOTE: 1996 is an average of 1995 and 1997 created as an assumption of the missing employment data. All table data and graph data that was assumed are noted with [1996].

Table II: WUTC Total

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
1991	285,680.75	302,132.29	580,147.06	1,167,960.09		Per Employee/Per Season			
1992	673,607.20	690,185.19	739,814.01	2,103,606.39					
1993	486,616.06	505,050.54	623,110.36	1,614,776.96					
1994	511,887.55	514,413.32	595,407.97	1,621,708.84					
1995	534,523.47	484,697.66	564,386.79	1,583,607.92	56,872.00	9.40	8.52	9.92	27.85
[1996]	461,140.71	448,283.42	520,268.27	1,429,692.40		8.02	7.70	8.91	24.64
1997	374,299.43	387,577.77	445,000.18	1,206,877.38	56,316.00	6.65	6.88	7.90	21.43
1998	357,305.30	404,750.57	493,164.07	1,255,219.94	58,576.00	6.10	6.91	8.42	21.43
1999	377,891.28	389,957.51	467,766.68	1,235,615.46	59,749.00	6.32	6.53	7.83	20.68
2000	273,188.47	341,124.47	442,919.26	1,057,232.21					

Table I2: WUTC Census A

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	841.29	1,498.35	1,992.50	4,332.13					
1992	39,364.21	9,929.49	3,654.29	52,948.00					
1993	1,924.68	2,709.92	3,202.24	7,836.83					
1994	2,548.84	3,005.76	4,317.41	9,872.01					
1995	2,091.48	2,328.48	4,525.34	8,945.30	941.00	2.22	2.47	4.81	9.51
[1996]	1,719.08	2,108.33	3,485.87	7,313.28		2.39	2.54	4.40	9.33
1997	2,393.44	2,441.76	3,737.12	8,572.32	937.00	2.55	2.61	3.99	9.15
1998	2,025.36	2,332.52	2,881.68	7,239.56	964.00	2.10	2.42	2.99	7.51
1999	1,835.27	2,330.72	3,280.90	7,446.90	1,031.00	1.78	2.26	3.18	7.22
2000	1379.93	2585.30	3352.44	7317.67					

Graph I1: WUTC Census A

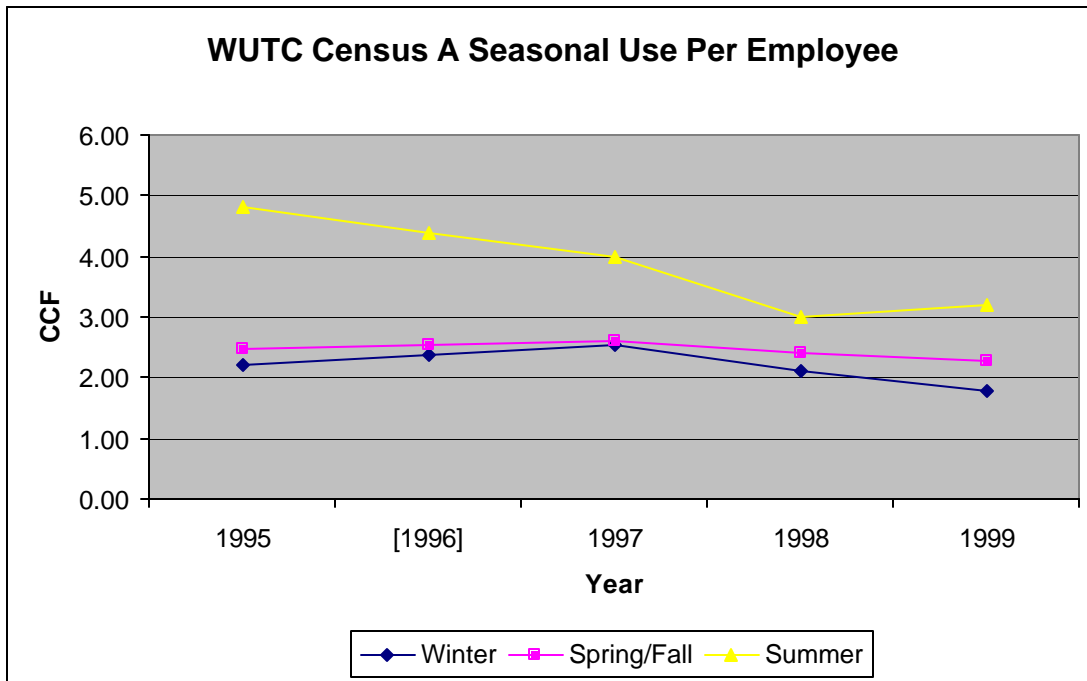


Table I3: WUTC Census B

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	613.49	366.27	239.08	1,218.84					
1992	1,214.29	1,149.33	604.50	2,968.12					
1993	793.41	714.62	557.36	2,065.39					
1994	777.53	892.47	653.91	2,323.90					
1995	1,001.94	1,126.16	1,521.40	3,649.51	1,080.00	0.93	1.04	1.41	3.38
[1996]	1,745.55	1,553.75	1,645.38	4,944.68		0.78	0.99	1.16	2.93
1997	1,106.50	1,642.97	1,596.03	4,345.50	1,745.00	0.63	0.94	0.91	2.49
1998	2,640.82	4,199.14	2,281.65	9,121.62	2,041.00	1.29	2.06	1.12	4.47
1999	2,309.80	1,204.86	1,381.20	4,895.85	1,703.00	1.36	0.71	0.81	2.87
2000	731.62	1,169.69	746.26	2,647.57					

Graph I2: WUTC Census B

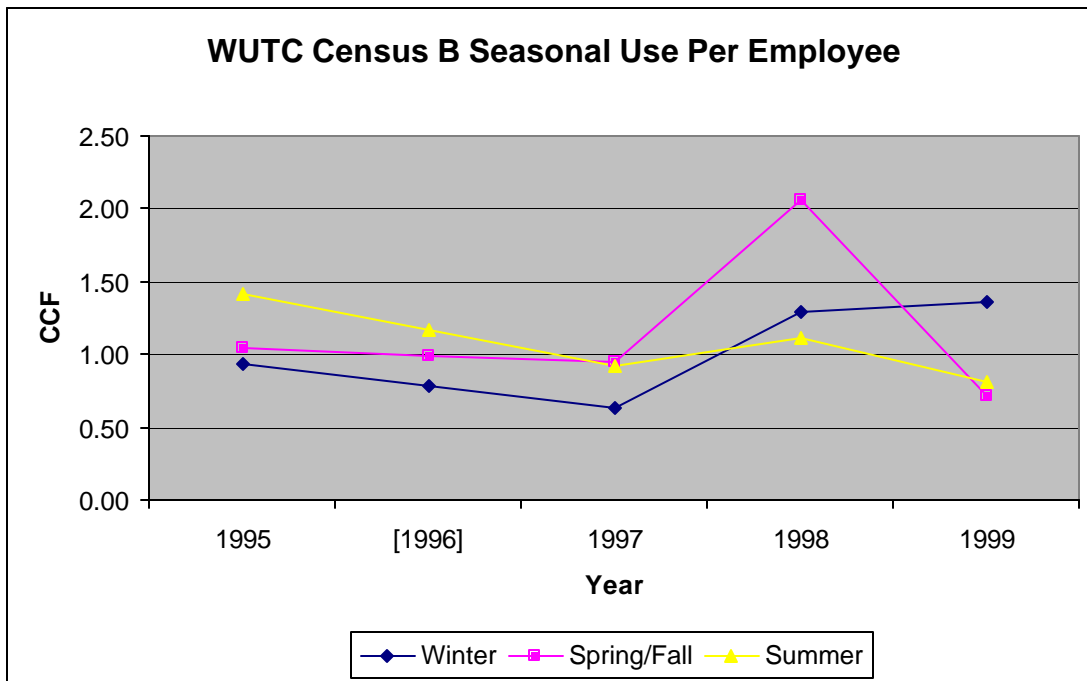


Table I4: WUTC Census C

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	7,457.22	10,496.37	16,590.39	34,543.98					
1992	15,001.13	13,814.76	12,284.91	41,100.80					
1993	15,400.03	13,700.18	14,810.63	43,910.84					
1994	17,481.35	21,484.79	24,439.96	63,406.10					
1995	17,386.00	16,764.92	26,011.28	60,162.20	2,301.00	7.56	7.29	11.30	26.15
[1996]	15,750.79	20,906.74	20,104.77	56,762.29		7.15	6.81	9.25	23.20
1997	14,331.28	13,480.81	15,296.58	43,108.67	2,128.00	6.73	6.33	7.19	20.26
1998	10,485.99	9,206.15	12,010.48	31,702.61	1,977.00	5.30	4.66	6.08	16.04
1999	7,472.85	7,661.61	9,579.72	24,714.18	1,918.00	3.90	3.99	4.99	12.89
2000	6988.36	7317.67	10234.29	24540.32					

Graph I3: WUTC Census C

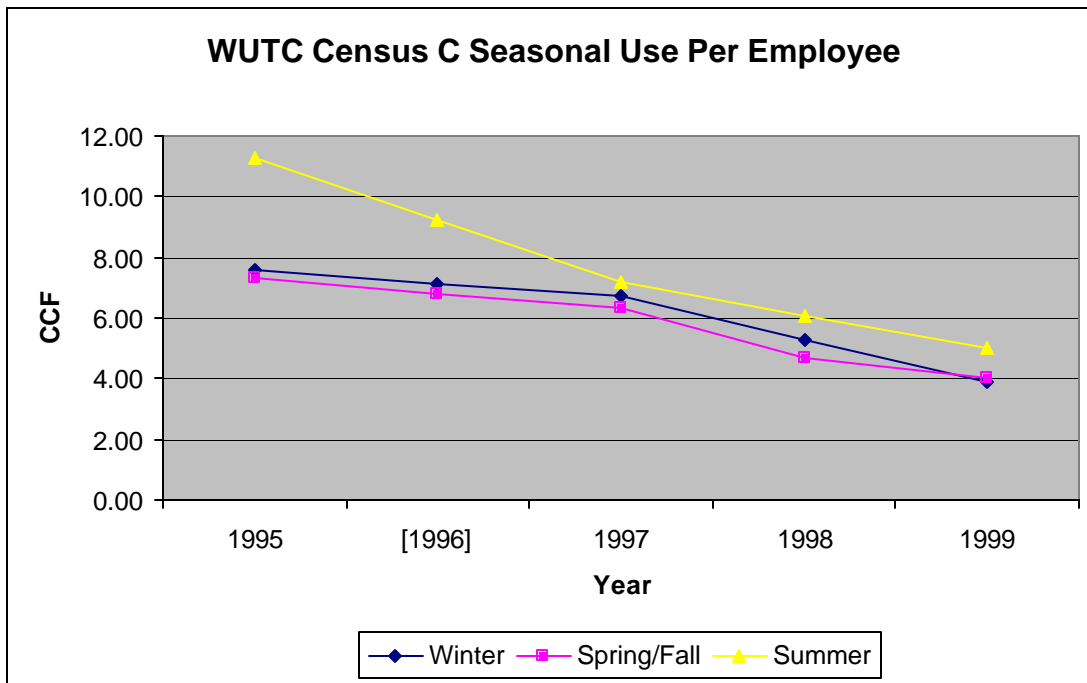


Table I5: WUTC Census D

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	3,843.77	3,734.15	10,769.19	18,347.11					
1992	8,182.67	6,963.12	5,132.84	20,278.63					
1993	7,495.73	6,628.44	19,928.07	34,052.24					
1994	8,222.17	7,518.29	9,713.12	25,453.59					
1995	9,193.10	11,970.32	11,686.92	32,850.35	1,038.00	8.86	11.53	11.26	31.65
[1996]	10,480.40	11,947.98	12,781.37	35,209.75		8.08	9.57	9.63	27.28
1997	10,379.84	10,792.33	11,352.39	32,524.56	1,420.00	7.31	7.60	7.99	22.90
1998	11,730.26	11,627.88	18,571.08	41,929.22	1,580.00	7.42	7.36	11.75	26.54
1999	13,181.30	13,171.38	12,279.89	38,632.58	1,489.00	8.85	8.85	8.25	25.95
2000	6993.72	10370.45	11655.82	29019.99					

Graph I4: WUTC Census D

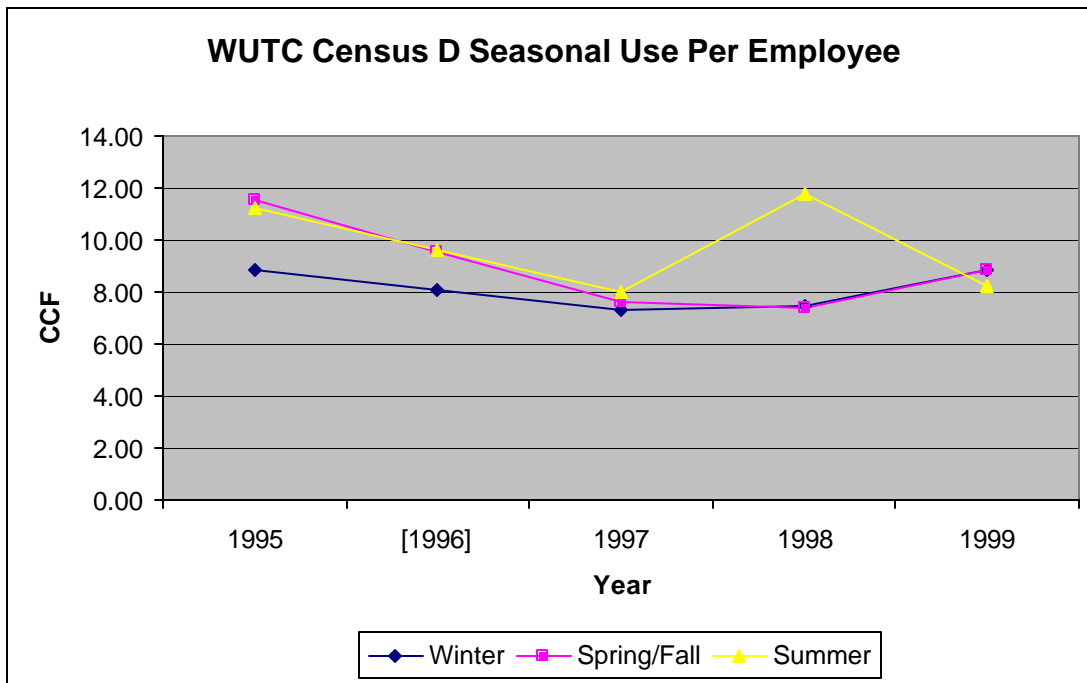


Table I6: WUTC Census E

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	376.06	626.44	1,493.66	2,496.16					
1992	826.47	746.06	864.36	2,436.90					
1993	437.95	607.83	702.31	1,748.08					
1994	455.08	666.23	997.54	2,118.86					
1995	331.02	459.11	918.52	1,708.65	719.00	0.46	0.64	1.28	2.38
[1996]	17.90	130.90	721.94	870.75		0.25	0.36	0.80	1.42
1997	27.21	55.00	216.39	298.60	653.00	0.04	0.08	0.33	0.46
1998	37.41	98.39	134.40	270.19	596.00	0.06	0.17	0.23	0.45
1999	64.43	96.34	160.12	320.89	860.00	0.07	0.11	0.19	0.37
2000	117.53	136.19	344.20	597.92					

Graph I5: WUTC Census E

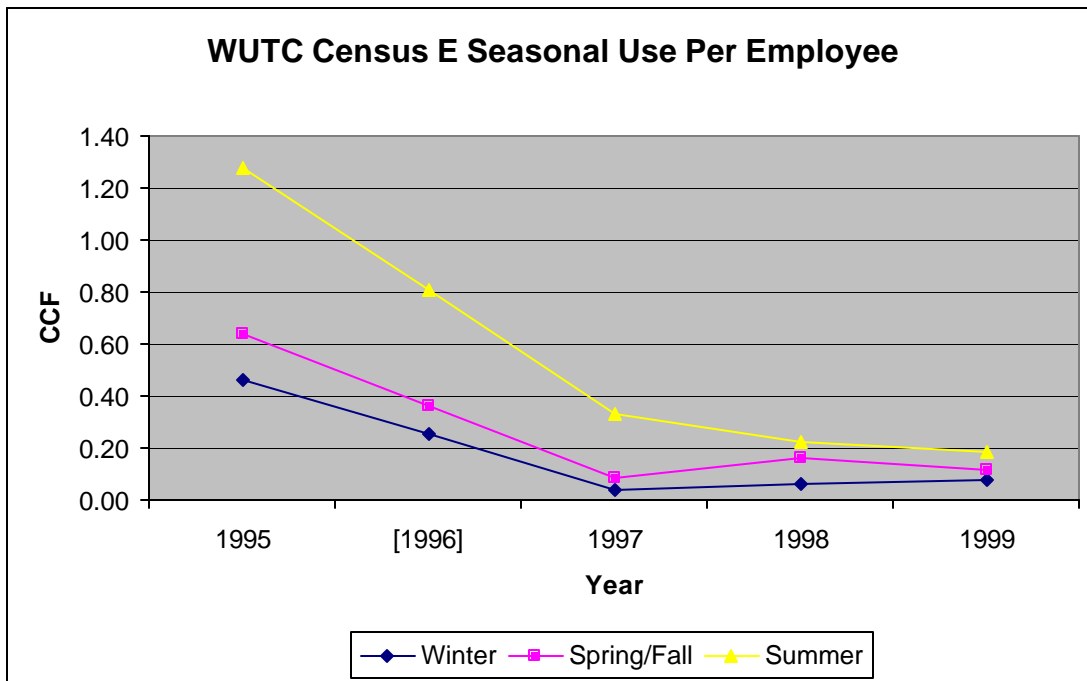


Table I7: WUTC Census F

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	39,028.08	39,952.76	50,433.09	129,413.93					
1992	88,516.20	86,551.52	72,655.51	247,723.23					
1993	93,060.39	98,102.50	134,819.34	325,982.23					
1994	156,868.64	110,976.63	114,292.62	382,137.89					
1995	216,791.69	123,154.26	94,998.21	434,944.16	6,901.00	31.41	17.85	13.77	63.03
[1996]	139,266.61	139,497.15	163,082.52	441,846.29		22.45	15.62	13.20	51.27
1997	100,270.79	99,557.46	93,910.36	293,738.62	7,432.00	13.49	13.40	12.64	39.52
1998	65,803.14	89,167.21	86,825.31	241,795.66	7,757.00	8.48	11.50	11.19	31.17
1999	61,897.21	59,441.23	68,766.76	190,105.20	8,015.00	7.72	7.42	8.58	23.72
2000	49,838.26	53,325.48	62,299.06	165,462.80					

Graph I6: WUTC Census F

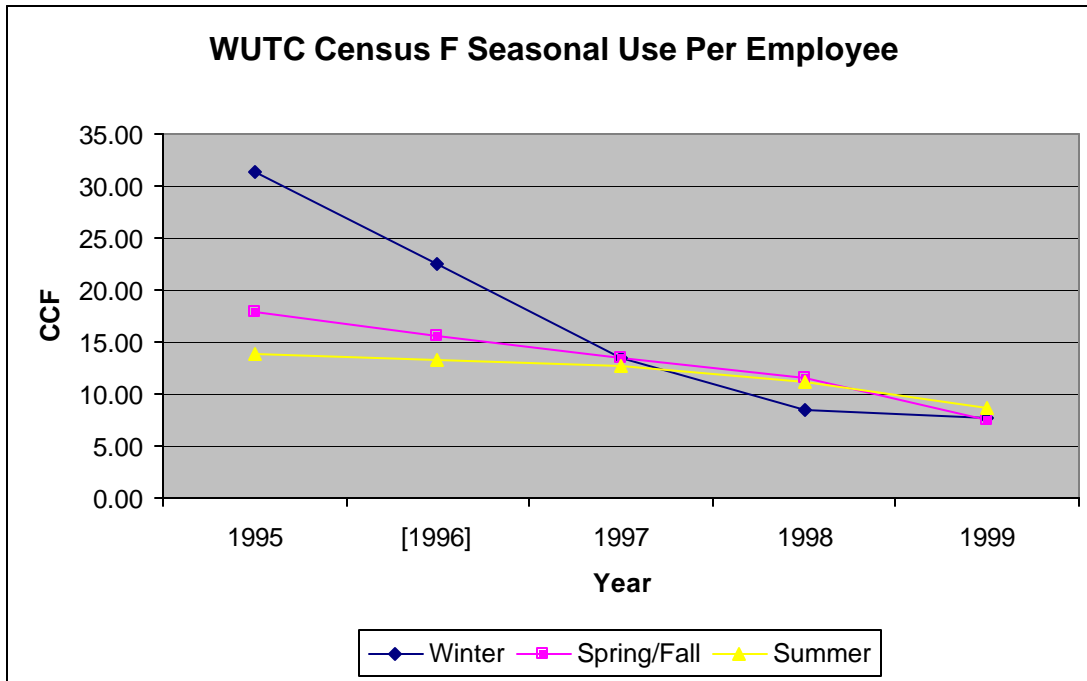


Table I8: WUTC Census G

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	229.90	311.72	783.72	1,325.35					
1992	499.67	1,413.47	2,061.70	3,974.84					
1993	612.16	1,522.58	1,860.45	3,995.19					
1994	652.94	572.70	614.45	1,840.09					
1995	441.29	410.54	734.37	1,586.19	534.00	0.83	0.77	1.38	2.97
[1996]	458.89	478.51	612.75	1,550.15		0.96	0.86	1.60	3.42
1997	471.67	413.17	782.94	1,667.78	431.00	1.09	0.96	1.82	3.87
1998	575.57	504.40	548.95	1,628.92	572.00	1.01	0.88	0.96	2.85
1999	394.37	329.41	422.84	1,146.62	490.00	0.80	0.67	0.86	2.34
2000	174.94	553.94	515.99	1244.87					

Graph I7: WUTC Census G

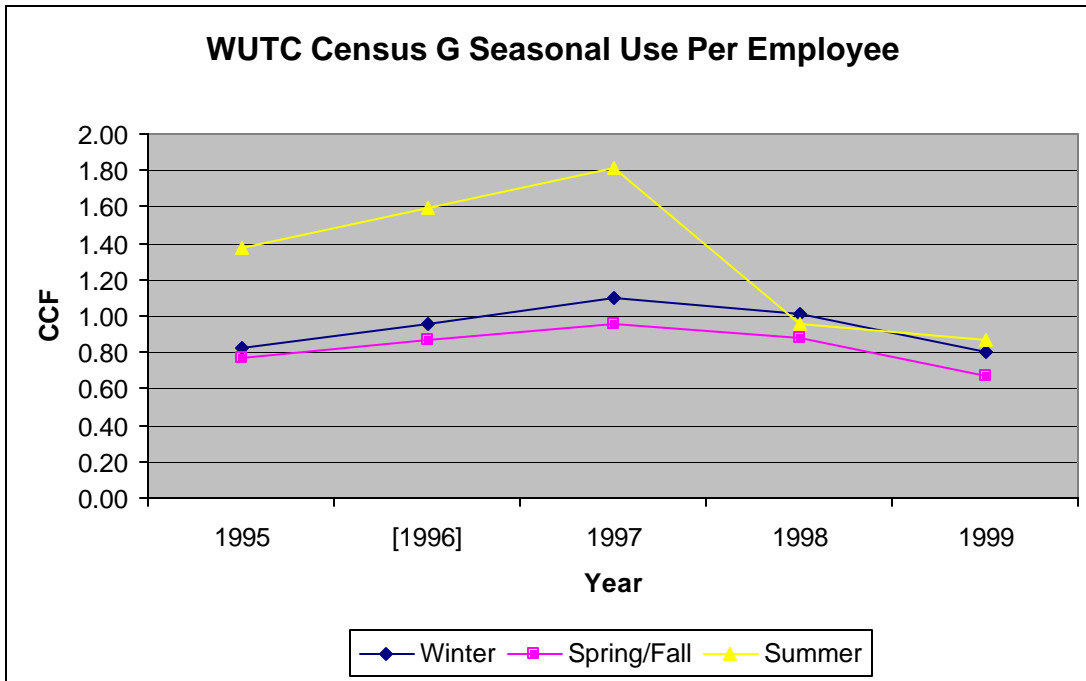


Table I9: WUTC Census H

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	5,610.11	9,243.35	19,710.81	34,564.27					
1992	12,848.85	20,580.48	26,574.27	60,003.60					
1993	10,244.99	10,992.96	12,953.66	34,191.61					
1994	9,030.19	10,664.54	15,025.12	34,719.85					
1995	7,656.69	9,180.54	12,390.67	29,227.90	17,884.00	0.43	0.51	0.69	1.63
1996	10,529.30	11,316.78	18,168.01	40,014.08		0.57	0.62	0.84	2.02
1997	12,509.50	13,051.84	17,425.43	42,986.77	17,795.00	0.70	0.73	0.98	2.42
1998	14,532.16	19,890.48	24,327.22	58,749.86	19,284.00	0.75	1.03	1.26	3.05
1999	15,678.39	18,726.51	20,017.55	54,422.45	19,400.00	0.81	0.97	1.03	2.81
2000	10410.99	17987.55	31938.08	60336.62					

Graph I8: WUTC Census H

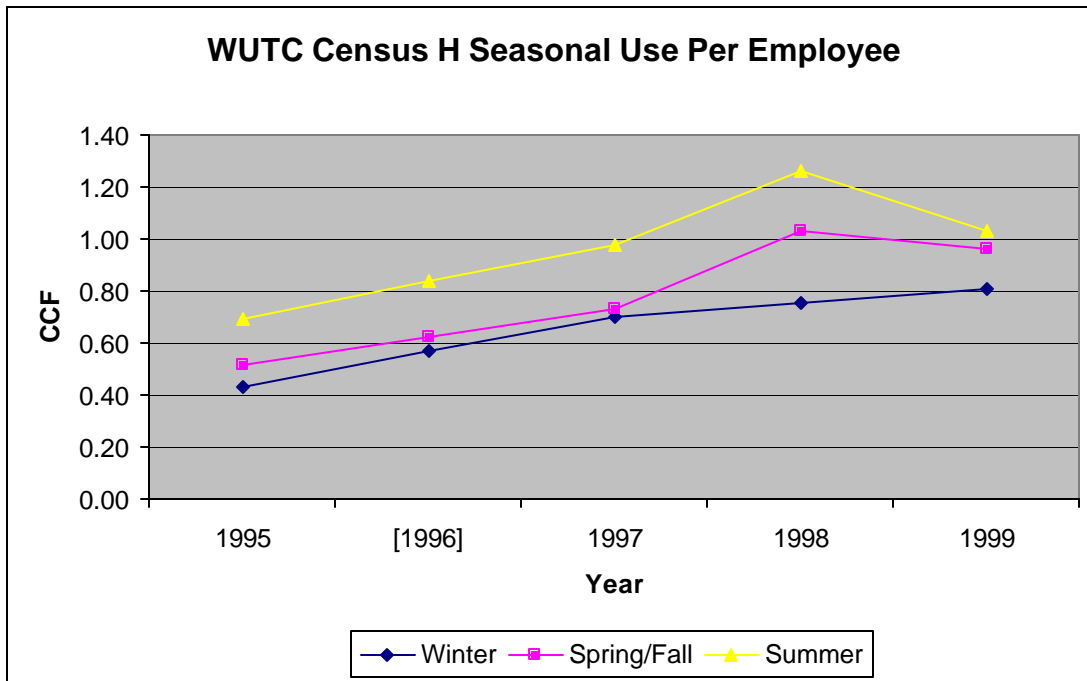


Table I10: WUTC Census I

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	31,400.77	39,057.28	62,885.88	133,343.93					
1992	66,824.90	67,428.65	66,196.66	200,450.20					
1993	49,348.54	59,539.66	63,919.93	172,808.12					
1994	45,055.33	55,474.08	64,903.23	165,432.64					
1995	53,179.41	60,415.59	66,737.37	180,332.37	14,329.00	3.71	4.22	4.66	12.59
[1996]	53,865.94	60,793.45	69,612.01	184,271.40		4.12	4.47	4.91	13.49
1997	56,327.16	58,716.03	64,290.49	179,333.69	12,455.00	4.52	4.71	5.16	14.40
1998	59,247.43	63,212.95	66,167.00	188,627.38	12,507.00	4.74	5.05	5.29	15.08
1999	64,796.73	68,360.26	71,661.30	204,818.29	12,926.00	5.01	5.29	5.54	15.85
2000	41938.19	52373.02	55464.56	149775.77					

Graph I9: WUTC Census I

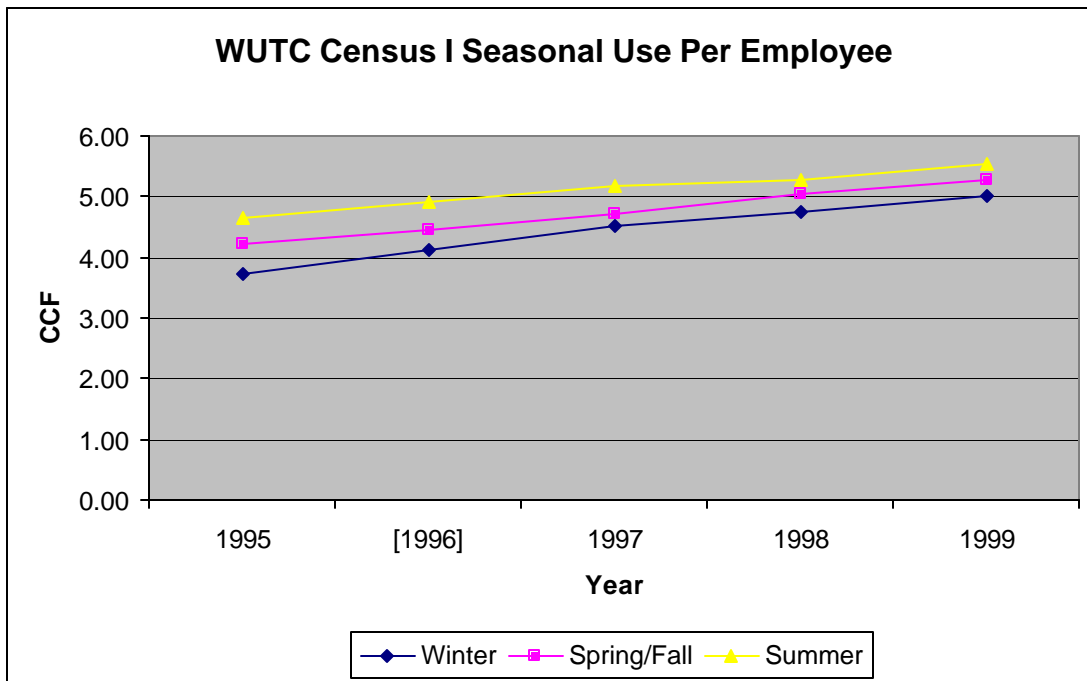


Table I11: WUTC Census J

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	# Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	6,441.47	7,191.20	13,334.00	26,966.66					
1992	15,166.21	14,232.03	16,118.40	45,516.64					
1993	13,205.58	13,877.76	15,582.56	42,665.90					
1994	14,031.37	17,932.05	19,574.64	51,538.06					
1995	18,008.90	29,027.87	35,192.94	82,229.71	1,674.00	10.76	17.34	21.02	49.12
[1996]	29,768.55	22,656.26	25,994.34	78,419.15		12.84	16.06	19.15	48.05
1997	29,085.51	28,810.64	33,705.86	91,602.02	1,950.00	14.92	14.77	17.29	46.98
1998	19,255.56	20,493.06	24,197.77	63,946.38	1,946.00	9.89	10.53	12.43	32.86
1999	13,971.20	14,180.66	17,136.93	45,288.80	1,953.00	7.15	7.26	8.77	23.19
2000	8796.80	13664.66	17231.10	39692.55					

Graph I10: WUTC Census J

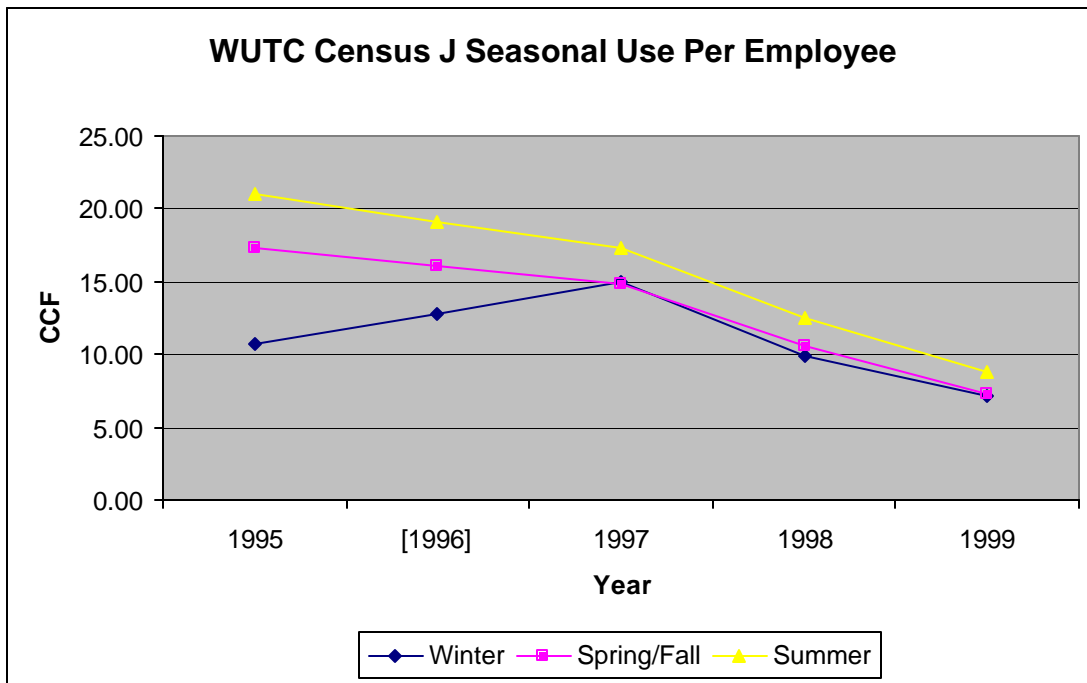
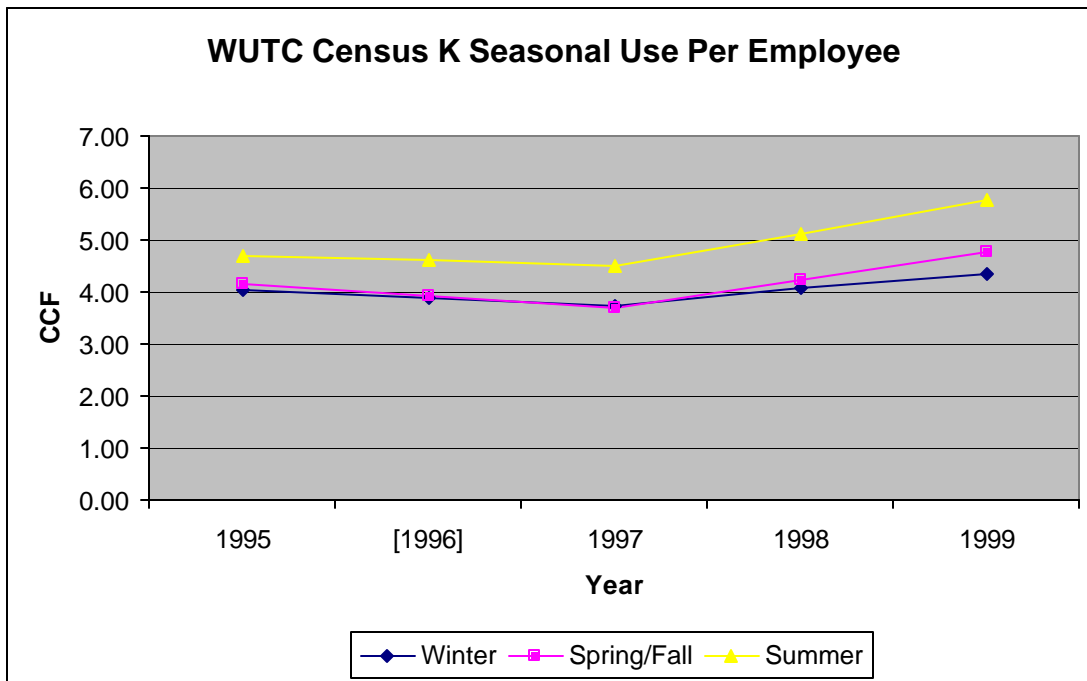


Table I12: WUTC Census K

Year	Winter CCF	Spring/Fall CCF	Summer CCF	Total CCF	#Employee	Winter	Spring/Fall	Summer	Per Employee
						Per Employee/Per Season			
1991	40,680.08	39,151.72	150,026.52	229,858.31					
1992	111,932.66	143,834.26	172,216.02	427,982.95					
1993	80,005.07	63,368.52	65,203.48	208,577.08					
1994	46,619.35	50,133.29	56,027.94	152,780.58					
1995	38,130.88	39,310.13	44,459.83	121,900.84	9,471.00	4.03	4.15	4.69	12.87
[1996]	36,710.56	44,773.45	50,162.38	131,646.39		3.88	3.92	4.60	12.39
1997	34,920.90	34,586.95	42,150.74	111,658.58	9,370.00	3.73	3.69	4.50	11.92
1998	38,210.66	39,690.78	47,799.41	125,700.85	9,352.00	4.09	4.24	5.11	13.44
1999	43,387.20	47,381.46	57,301.22	148,069.88	9,964.00	4.35	4.76	5.75	14.86
2000	29011.57	35822.68	50585.56	115419.81					

Graph I11: WUTC Census K



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Acknowledgements

Thank you to Seattle Public Utilities for providing me with this wonderful research opportunity. This research was made possible with the assistance, constructive critics and advice of Tiva Brown, Tim Skeel and John Madison. Tiva has been the most helpful and instructive individual. I have learned new aspects of Microsoft Excel, Access and ArcView. Without her support, the project would have been impossible. Thanks to Tim for presenting and molding the per capita/per employee research goal. Lastly, my appreciation for John Madison who has digested and edited my research.