



# Executive Summary

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The 2012 Calgary and Region Travel and Activity Survey (CARTAS) is a comprehensive household travel survey that provides a rich set of information that can be assessed and evaluated to support transportation decision makers. The information collected reveals travel patterns, and also allows for an in-depth analysis into the underlying factors that influence the travel decisions that are made every day by city and region residents. The City of Calgary has been conducting household travel surveys approximately every 10 years since 1964 which allows for both the analysis of current information, but also a look back to see how travel behaviours and influences have changed over time.

To fully explore these changes, a series of reports will be developed in 2013 with in-depth analysis of different elements of travel. This report is the first of the series and will provide some high level information on population and employment growth, household demographics, auto ownership travel mode, and travel statistics.

## Key Findings

The initial analysis focused on broad study area, regional, and city-wide analysis and highlighted a few key changes:

### 1. City wide, all day, all purpose auto mode share has increased since 2001

The Calgary Region has seen a significant increase in population and employment over the last 30 years and a 29% increase in population since 2001. The City population increased by 24% since 2001 with 103% of the growth experienced in the City located in the Greenfield Sectors.

Employment continues to grow in the City and while employment in the Greenfield sectors has seen the largest growth, it is only 8% of the employment in The City. 50% of employment in The City is located in the Downtown or Industrial areas of the City.

The implication is that people are living further from where they work which impacts the methods residents are using to travel. The auto mode share by City residents has increased from 77% in 2001 to 79% in 2011. Transit mode share has remained the same and the walk mode share has decreased from 14% to 12%. This is likely a result of the population growth distribution in the City as the growth is occurring in areas of the city that have fewer service and transportation options which result in people continuing to use the auto mode.

### 2. AM Transit mode share to the downtown has increased since 2001

In the AM peak period, weekdays from 6am to 9am, the transit mode share has increased from 28% in 2001 to 33% in 2011. That walk mode share has also increased from 13% to 18% and the auto mode share has decreased from 57% to 46%. This is likely due to the infrastructure investment in transit and pedestrian facilities to improve access to downtown by these modes.

### 3. Household auto ownership rates have increased since 2001

In 2011, the average household auto ownership in the City was 1.85 in 2011 which is an increase from 1.72 observed in 2001. This is likely due to an increase of 75% in the number of households with 3 or more cars. However, the number of zero car households in the City increased by 41%, which is higher than a proportional increase and indicates that the number of households with zero cars is on the rise.

The opposite is true in the region, zero car households continue to decline and the number of region households with 3 or more vehicles has more than doubled. This is reflected in the higher regional household auto ownership rate which was 2.56 in 2011, up from 2.11 observed in 2001.

### 4. Calgary Region population is aging

The population in the Calgary Region is aging as the number of people aged 65 years or older has increased by 90% since 2001 (89% in The City and 92% in The Region), which is disproportionate to the total population increase. This has a significant impact on travel as this age group tends to travel less and make fewer compulsory trips and affects where and when people travel.

### 5. Trip rates are influenced by Auto Ownership and Household Income

Household trip rates have declined since 2001, a result of declining household sizes. However, per person trip rates in the City have also declined. There are many possible explanations for this decline such as smaller households, flexible work hours, communication technology, this will be explored in detail in subsequent reports.

Trip rates are influenced by many factors including age, income and auto ownership. Adults in the 25-44 year old category have the highest adult trip rates while adults 65 years of age or old have the lowest trip rates. Households with higher incomes have higher trip rates as Study Area households with an income greater than \$100,000 make over 12 trips per household compared to 5.54 trips made by households with incomes under \$30,000. As expected, an increase in auto ownership results in an increased household trip rate. Study Area households that own three or more vehicles makes 12.29 trips per household and a household with zero cars makes 3.91 trips.

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## Report Purpose

The purpose of this report is to communicate the preliminary results of the Calgary and Region Travel and Activity Survey that was conducted in early 2012 and compare those results to travel surveys conducted in the past. This report is the first in a series of reports that will be released in 2013 and will cover population changes, survey methodology, household travel characteristics, trips rates, and mode split. Additional travel behaviour information will be released in subsequent reports throughout the year.

CARTAS was conducted in 2012 and was expanded to a variety of demographic targets to represent to total study area population. The demographic targets for this survey were obtained from the Calgary Civic Census and Census of Canada and were based on data from 2011 as that is what was available at the time. The result is the information presented in this report represents travel behaviour conditions from 2011. This report will also examine travel from 1981, 1991, 2001 and 2011.

## Background

In 2012, The City of Calgary conducted the Calgary and Region Travel and Activity Survey (CARTAS), a comprehensive travel and activity survey to collect travel behaviour information to update the Calgary Regional Transportation Model (RTM). The RTM is a computer simulation of the city and surrounding region that uses travel survey data to replicate the travel behaviour observed by city and region residents. Travel behaviour includes information about the trips people make, where they go, what they do, and any costs they incurred. It is also essential to observe the factors that influence travel choices including the number of people who live in the household, how old they are, where they work, what kind of work they do, where they go to school and the annual income of the household. By understanding all aspects of travel, decision makers can use the RTM to test changes to travel conditions and forecast the travel behaviour response.

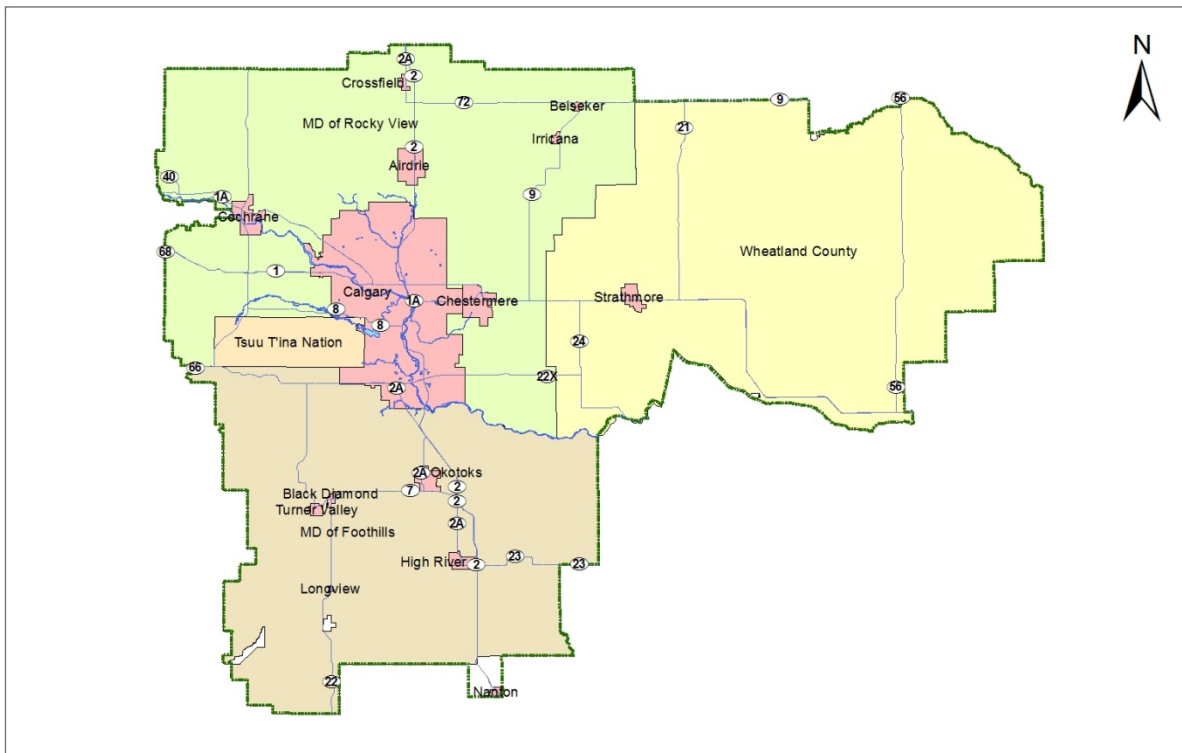
The City of Calgary has maintained travel models since the first Calgary Transportation Study was conducted in 1964. The model has been updated approximately every ten years and has added additional features as technology and needs have changed. The data collected in the Calgary and Region Travel and Activity Survey will be used to update the RTM to 2011 conditions.

The City of Calgary wishes to thank every household who participated in the survey along with our partners, Alberta Transportation and the Calgary Regional Partnership.

## Study Area Description

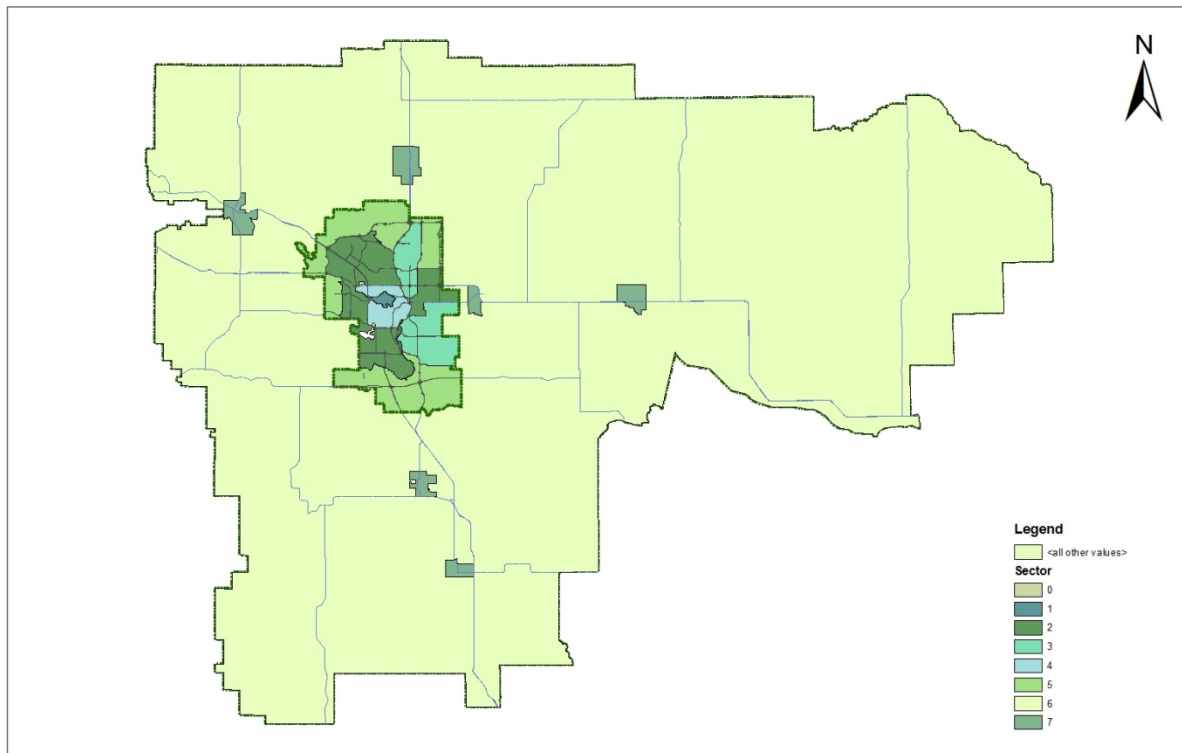
The Calgary and Region Travel and Activity Survey study area includes The City of Calgary, the municipal District of Foothills, Rockyview County, Wheatland County, and all the towns and villages within those boundaries including: Airdrie, Chestermere, Cochrane, High River, Okotoks, Nanton, and Strathmore. The Region is an important inclusion in the survey as regional travel, including travel between the City and the Region, continues to grow. For the purpose of this report, the Study Area refers to the entire area, the City refers to the City of Calgary, and the Region refers to the region surrounding Calgary.

Figure 1: Study Area



To facilitate the presentation of survey findings, the study area has been divided into seven sectors, with five in the City and two in the Region. The City sectors include the Central Business District, Inner City, Industrial, Established, and Greenfield. The Region sectors are the rural areas in the region and the urbanized areas of the region. The boundaries of these sectors were determined based on the geography used to expand the survey and is intended to balance appropriate sample size, urban form, and level of detail. It was developed specifically for the purposes of this report and does not directly align with other urban form geographies.

Figure 2: Study Area Sectors



## Data Sources

One purpose of this report is to look at how travel has changed over that time. This report compares information between surveys conducted in 1981, 1991, 2001 and CARTAS as appropriate. Data for 1981 and 1991 were obtained from the Calgary GoPlan Report “A Comparison of Travel Behaviour in Calgary: 1971-1991.” The 2001 travel behaviour data was retrieved from the 2001 Household Activity Survey Database and the 2011 data was retrieved from the CARTAS database.

Table 1: Historical Travel Surveys

Survey	Year	Methodology	Details
<b>Calgary Transportation Study</b>	January – April 1981	Home interview survey	<ul style="list-style-type: none"> <li>• 24 Hour Travel</li> <li>• 9734 Households</li> <li>• City Only</li> </ul>
<b>GoPlan Study</b>	November 1991	Telephone Survey	<ul style="list-style-type: none"> <li>• AM Peak Hour Travel</li> <li>• 16,000 Households</li> <li>• City Only</li> </ul>
<b>Household Activity Survey</b>	September – November 2001	Computer Assisted telephone interview survey	<ul style="list-style-type: none"> <li>• 24 Hour Travel</li> <li>• 9700 Households</li> <li>• City and Region</li> <li>• Activity Information</li> </ul>
<b>Calgary and Region Travel and Activity</b>	January – May 2012	Multiple modes:	<ul style="list-style-type: none"> <li>• 24 Hour Travel</li> </ul>



<b>Survey</b>	<ul style="list-style-type: none"> <li>• Computer assisted telephone interview survey</li> <li>• Web survey</li> <li>• Mail survey</li> </ul>	<ul style="list-style-type: none"> <li>• 9,000 Households</li> <li>• City and Region</li> <li>• Activity Information</li> </ul>
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## Other Data Sources

Employment information presented in this report was obtained from the City of Calgary Place of Work Survey (2011) which collected employment information from City residents only. The Place of Work Survey was expanded using employment data from the 2006 Census of Canada. At this time, only limited employment information will be presented until updated employment information is released by Statistics Canada. Regional employment information will not be presented until results are released from the 2011 Census of Canada which is expected in Fall 2013.

## Data Availability and Release

The household travel survey datasets contain significant amounts of personal information and are protected by the Freedom of Information and Protection of Privacy Act. The database and the individual data records cannot be released outside of the Forecasting Division. The recent surveys are stored in complex relational databases that require expertise to ensure the results produced are accurate. If additional analysis is required, requests may be submitted to [tranplanforecast@calgary.ca](mailto:tranplanforecast@calgary.ca) and the request will be assessed appropriately.

## CTP / MDP Monitoring Program

In 2009, Calgary City Council approved a new transportation plan and land use plan called the Calgary Transportation Plan and Municipal Development Plan (CTP/MDP). This plan called for a monitoring and reporting program to monitor the progress of several indicators towards specific goals. The household travel survey is the provides the most direct method to observe Indicator 10: Transportation Mode Split. This report will provide information on mode split for 2011 that will act as a baseline for future monitoring program reports.

## Survey Limitations

CARTAS is a comprehensive and detailed survey that captures significant amounts of travel behaviour information. However, there are some limitations to the data that must be considered. The survey asked respondents to provide an arrival and departure time; however, respondents tend to round their arrival and departure times to the nearest 5, 10 or 15 minute intervals. As a result, travel times directly from the survey have limited accuracy and are only used to assign trips to broad time periods for modelling purposes.

CARTAS does not include any information on trip distance. Each location is geocoded, but respondents were not asked to provide travel route information. As a result, information on vehicle kilometres travelled (VKT) and VKT per capita are not a result that can be obtained from this survey.

This is a sample survey, not a census, and 2% of city and region households were sampled. This provides a statistically significant sample to develop travel models that are used to support decision making.

However, sample sizes at fine geographies or for specific demographics may be too small to be able to provide statistically significant results. For example, trip rates may be possible for Downtown Calgary, but not for the community of Dalhousie.

## Changing Demographics

### Population Growth

The Calgary Region is one of the fastest growing regions in Canada. The Study Area population has increased by 29% since 2001 and The City population has increased by 84% since 1981 which is higher than growth rates experienced for the same time period in all of Alberta (63%) and Canada (35%). The Region is growing at a faster rate than The City and has increased by 61% since 2001 and, as a result, the share of the population that lives in The Region has increased from 13% in 2001 to 16% in 2011.

Figure 3: Total Population - City - 1981 - 2011 <sup>1</sup>

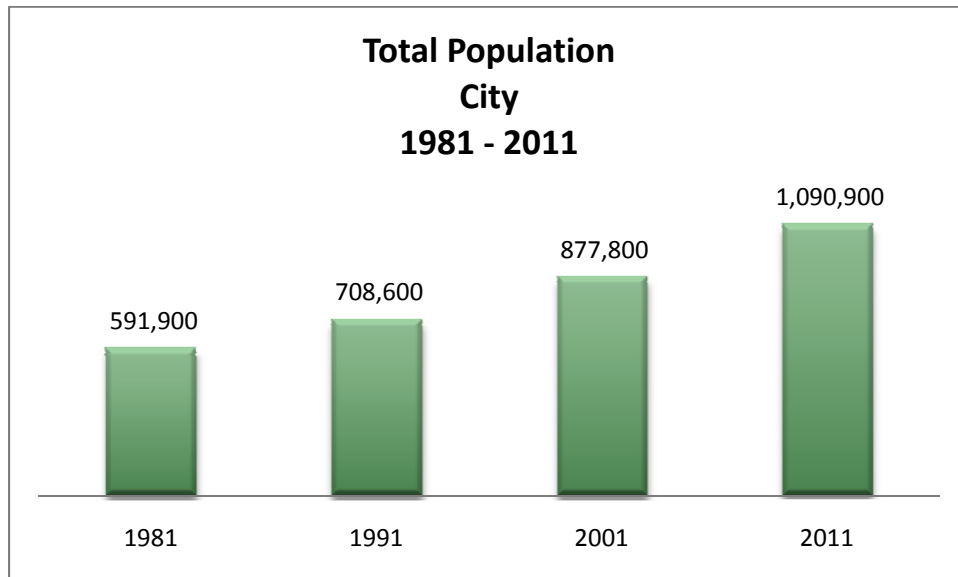


Table 2: 2001 - 2011 City and Region Population<sup>2</sup>

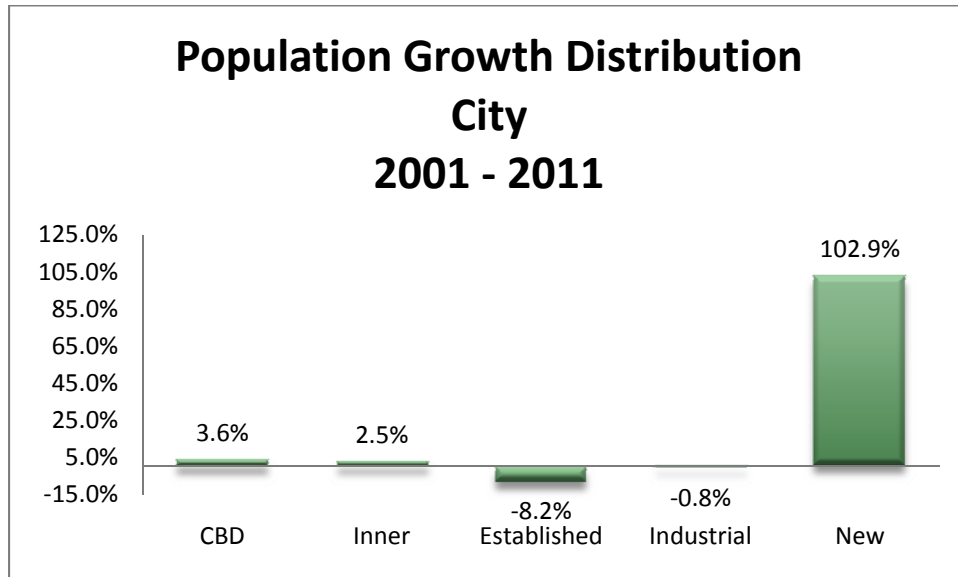
	2001		2011		% Difference
	#	%	#	%	%
<b>City Population</b>	877,800	87%	1,090,900	84%	24%
<b>Region Population</b>	128,000	13%	205,600	16%	61%
<b>Total Population</b>	1,005,800		1,296,500		29%

<sup>1</sup> (City of Calgary City Clerk's Office, 2011)

<sup>2</sup> (City of Calgary City Clerk's Office, 2011), (Statistics Canada, 2001), (Statistics Canada, 2011)

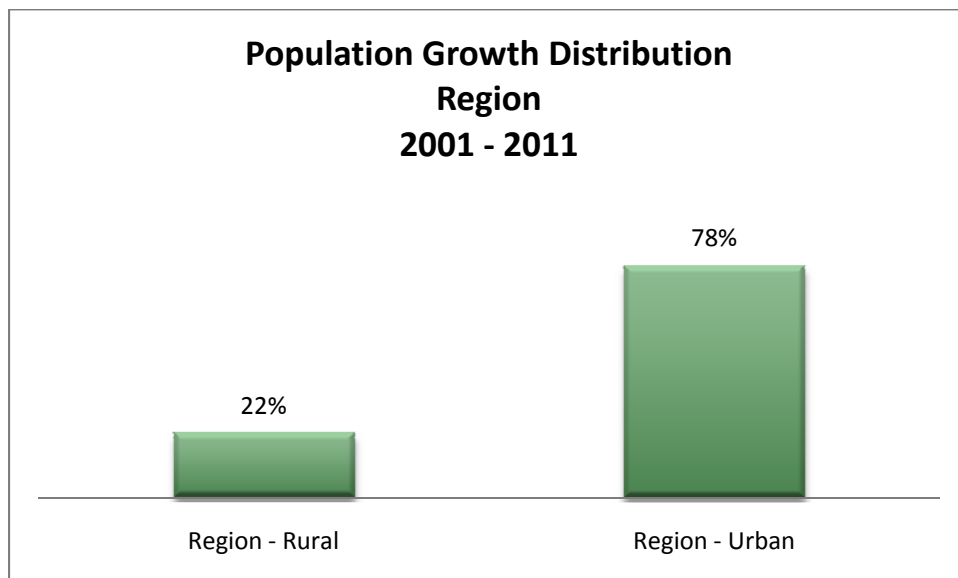
The population distribution in the study area is changing. In 2007, The City of Calgary annexed large areas of the Region, which opened up space for greenfield development. Since 2001, 103% of the growth experienced in The City has located in the Greenfield Sector and 7% of the growth has located in the CBD and Inner City. This has resulted in a decrease in population in the established areas of the city.

Figure 4: Distribution of Population Growth - City - 2001 – 2011 <sup>3</sup>



In the Region, 78% of the growth experienced in the Region is located in the urbanized areas of the region with the rest allocating to the rural areas.

Figure 5: 2001 –Distribution of Population Growth - Region - 2011 <sup>4</sup>



<sup>3</sup> (City of Calgary City Clerk's Office, 2011)

<sup>4</sup> (Statistics Canada, 2011), (Statistics Canada, 2001)

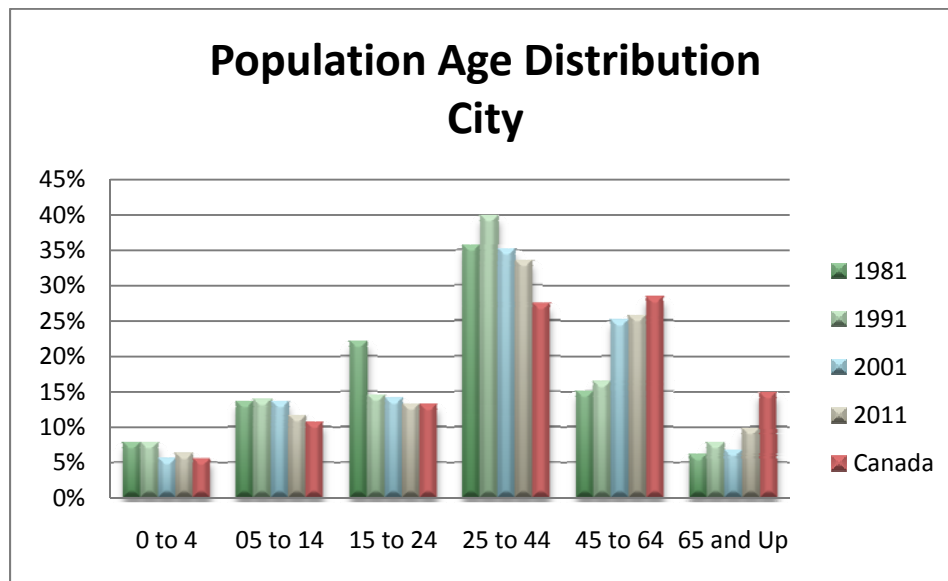
### Aging Population

The population of the study area is aging as the number of people aged 65 years or older has increased by 89% since 2001 and makes up 10% of the population as compared to 6% of the population in 1981. Calgary also experienced a large amount of migration. An average of 56% of Calgary’s growth from 2001 to 2011 is due to migration from other parts of Canada or the world, and results in The City having a higher proportion of 25 to 44 year olds than the average in Canada.

Table 3: Age Distribution – City - 1981 – 2011 <sup>5</sup>

Age Category	1981		1991		2001		2011	
	#	%	#	%	#	%	#	%
<b>0 to 4</b>	45900	8%	55200	8%	46000	5%	68400	6%
<b>05 to 14</b>	80400	14%	98100	14%	113800	14%	126200	12%
<b>15 to 24</b>	130500	22%	102400	14%	117500	14%	144300	13%
<b>25 to 44</b>	210700	36%	281700	40%	293500	35%	365100	33%
<b>45 to 64</b>	88600	15%	116000	16%	209800	25%	280400	26%
<b>65 and Up</b>	35700	6%	55200	8%	56200	7%	106500	10%
<b>Total</b>	591800		708600		836800		1090900	

Figure 6: Population Age Distribution – City - 1981 – 2011 <sup>6</sup>



<sup>5</sup> (City of Calgary Transportation Department, 1993), (City of Calgary City Clerk's Office, 2001), (City of Calgary City Clerk's Office, 2011)

<sup>6</sup> (City of Calgary Transportation Department, 1993), (City of Calgary City Clerk's Office, 2011), (Statistics Canada, 2001), (Statistics Canada, 2011)

### Job Growth

The number of jobs in the City continues to grow and has increased by 36% since 2001 and 108% since 1981. The number jobs per capita have also increased since 1981 reflecting the rise of dual income households.

Figure 7: Total Employment - City - 1981 – 2011 <sup>7</sup>

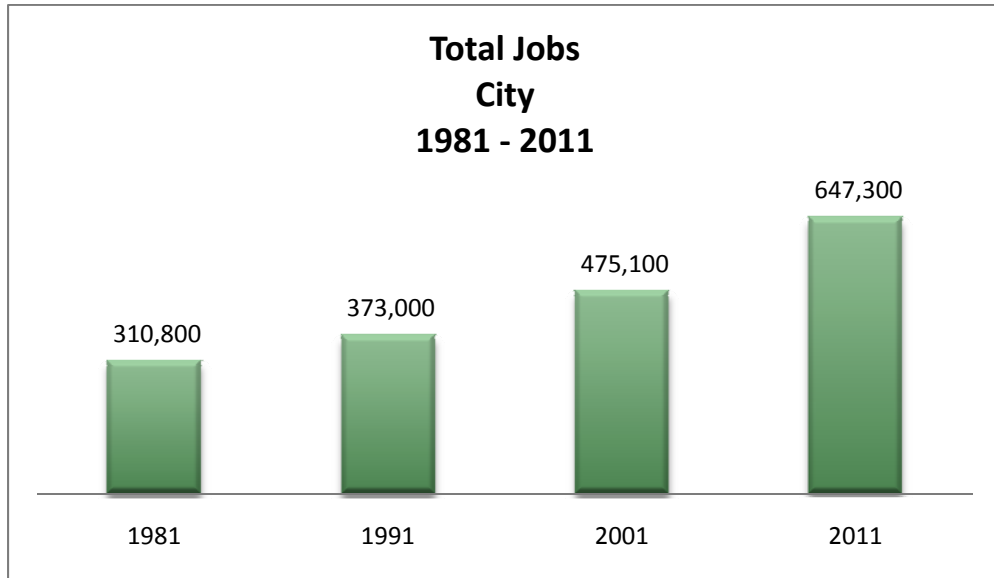
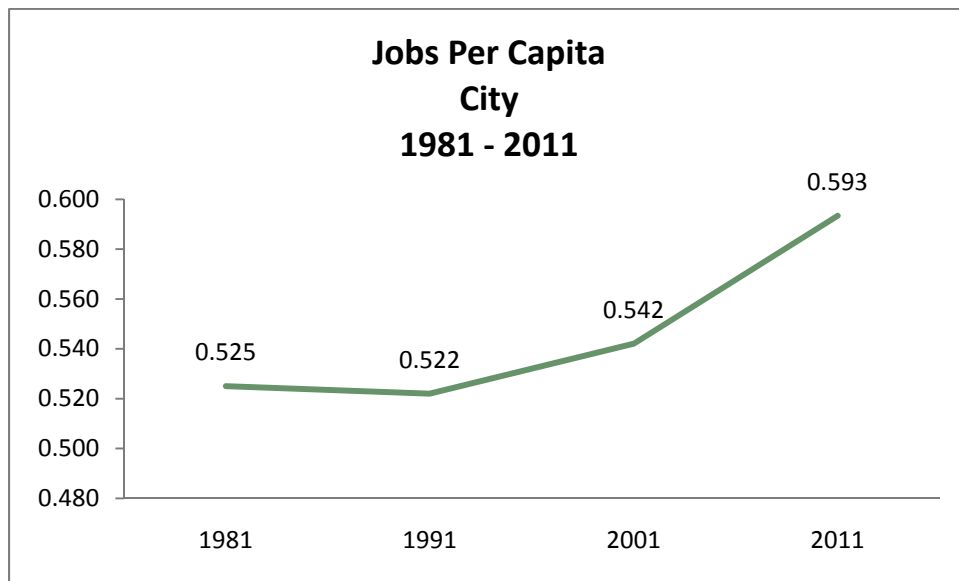


Figure 8: Jobs Per Capita - City - 1981 – 2011 <sup>8</sup>



<sup>7</sup> (City of Calgary Transportation Department, 1993), (City of Calgary Transportation Department, 2001), (City of Calgary Transportation Department, 2011)

<sup>8</sup> (City of Calgary Transportation Department, 1993), (City of Calgary Transportation Department, 2001), (City of Calgary Transportation Department, 2011)

The largest areas of employment growth are in the Greenfield Sector. This is a result of the land annexation and the development of several large retail and employment centres in the outer areas of the city. The outer areas of the City continue to have a relatively small share of the total employment with 8% in 2011. The CBD continues to grow, but the share of jobs located in the CBD has decreased from 30% in 2001 to 26% in 2011. The industrial areas of the City have also seen significant growth due to the development of industrial lands near the airport and in southeast Calgary.

Table 4: Employment Distribution - City - 2001 – 2011<sup>9</sup>

	2001		2011		# Difference
	#	%	#	%	%
<b>CBD</b>	141,200	30%	170,800	26%	21%
<b>Inner</b>	76,400	16%	95,500	15%	25%
<b>Established</b>	132,500	28%	173,800	27%	31%
<b>Industrial</b>	102,000	21%	153,900	24%	51%
<b>New</b>	22,900	5%	53,300	8%	133%
<b>Total Employment</b>	475,000		647,300		

## Changing Travel Influences

It is essential to understand the different factors that influence travel decisions made by City and Region residents. Most travel decisions are not spur of the moment, before people leave their homes they know where they are going, what they are going to do and how they are going to get there. Those decisions are dependent on the demographics of their households such as how many people live together, how old they are, where they work or go to school, household income, and what travel options are available to them.

This section of the report focuses on the elements that influence travel behaviour and examines how those elements have changed over time.

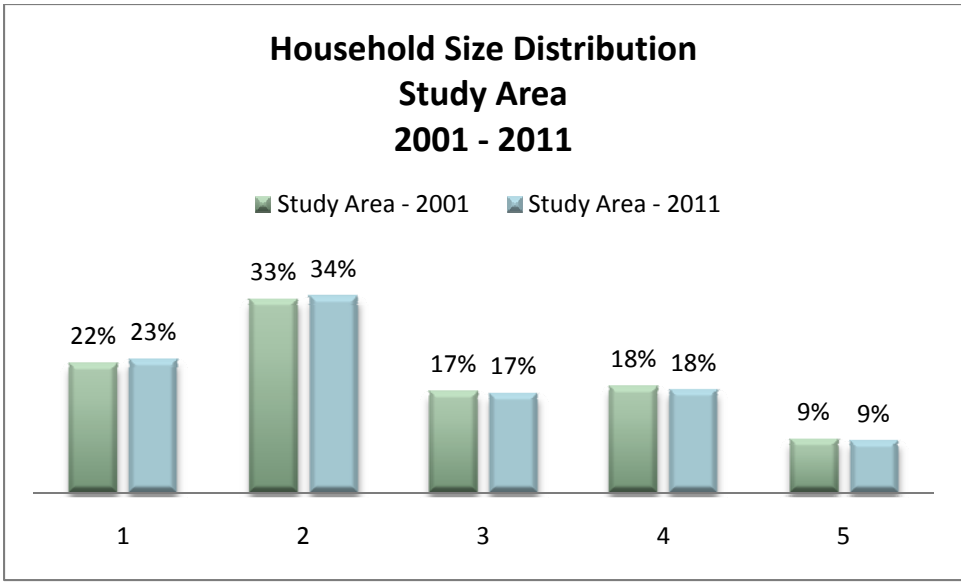
### Household Size

Household size is the number of people living in the same dwelling that share a kitchen. This includes people living on their own, with their families, with roommates, or multi-generational households. Household size is an important travel characteristic as the number of people in a household affects the travel choices and resources that are available.

The Study Area demonstrates a decrease in household size from 2.67 in 2001 to 2.62 in 2011. This is due to the increase in 1 and 2 person households.

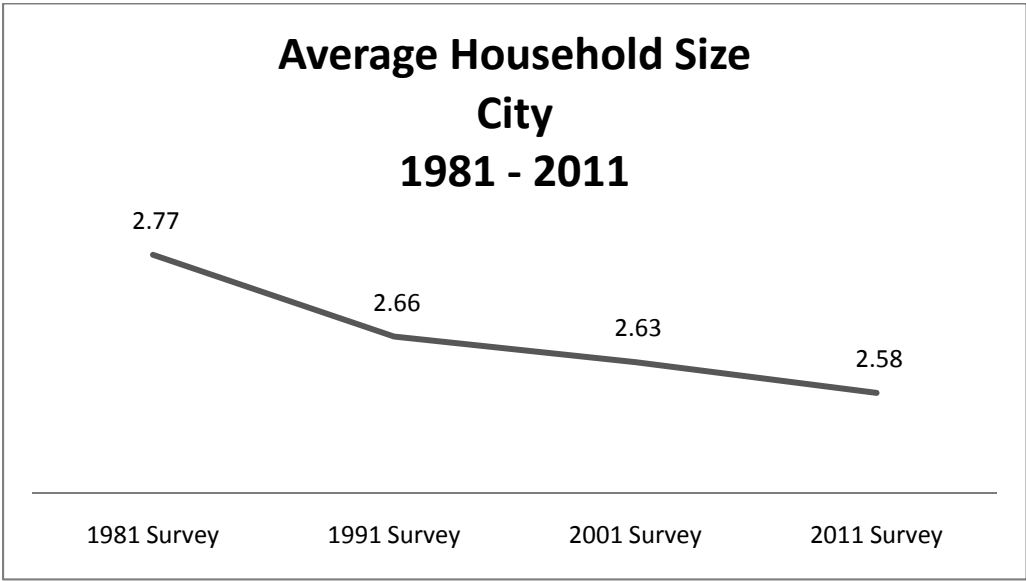
<sup>9</sup> (City of Calgary Transportation Department, 1981), (City of Calgary Transportation Department, 2001), (City of Calgary Transportation Department, 2011)

Figure 9: 2001 - 2011 Study Area Household Size Distribution<sup>10</sup>



Average household size in the City is part of long term trend that that has seen household sizes decrease from an average household size of 2.77 in 1981 to an average household size of 2.62 in 2011. The distribution of household sizes in the City has not changed significantly, as growth rates across all household sizes are close to the average.

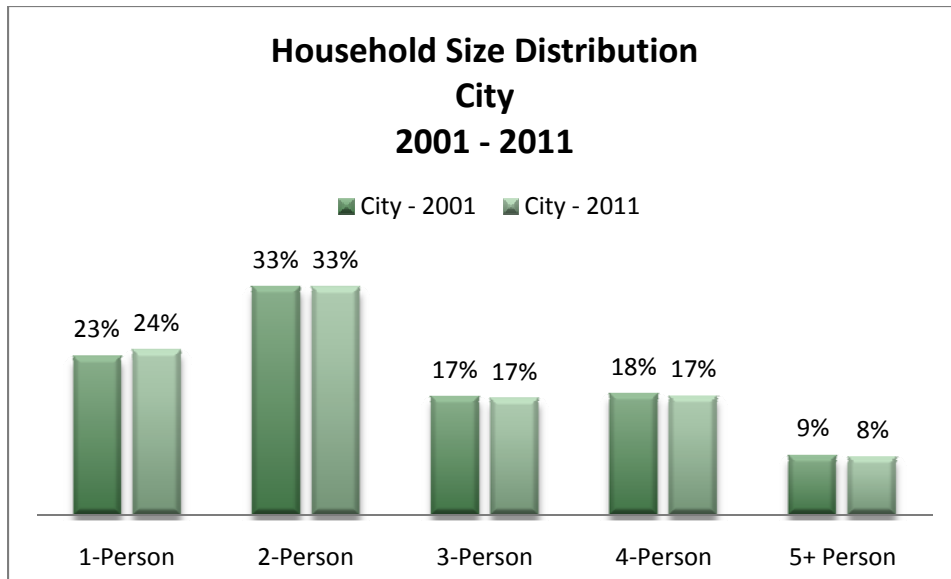
Figure 10: Average Household Size - City - 1981 – 2011<sup>11</sup>



<sup>10</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

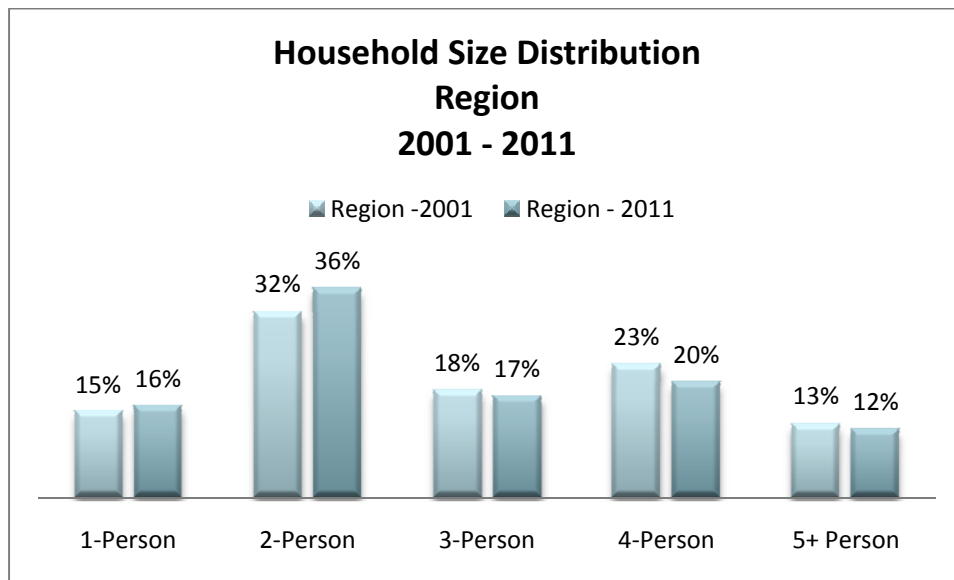
<sup>11</sup> (City of Calgary Transportation Department, 1993), (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

Figure 11: Household Size Distribution - City - 2001 – 2011<sup>12</sup>



In the Region, average household sizes have also decreased from 2.98 in 2001 to 2.84 in 2011. This is a result of an increase in the proportion of 2 person households and a decrease in larger households. The Region has a higher average household size than the City due to a higher proportion of large households in The Region.

Figure 12: Household Size Distribution - Region - 2001 - 2011<sup>13</sup>

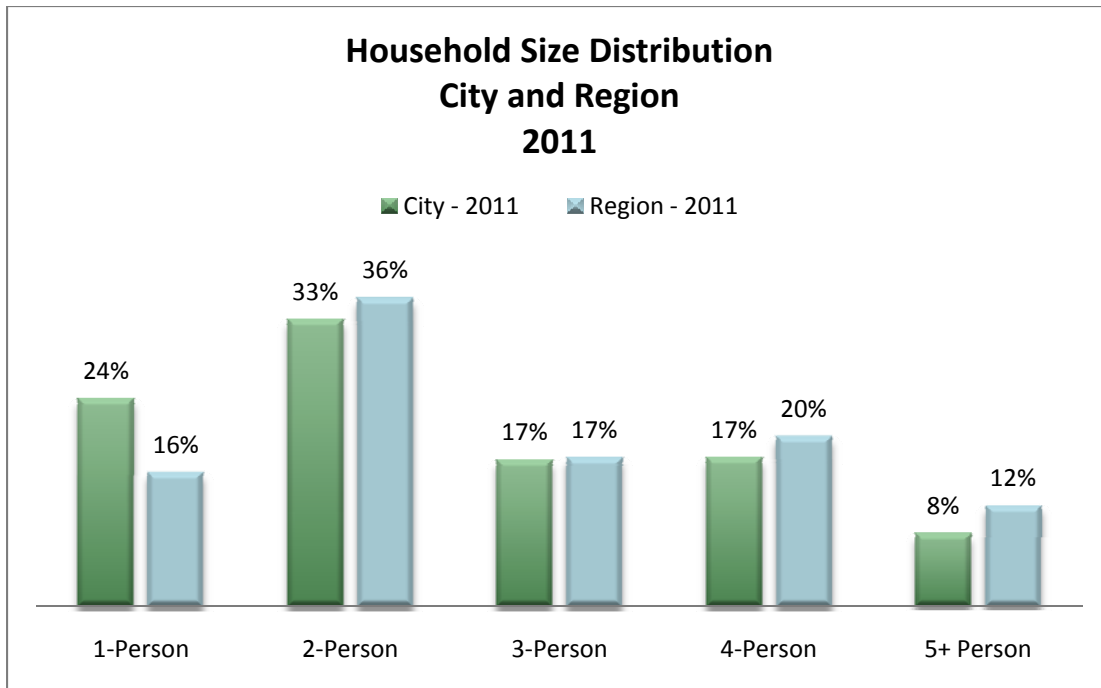


<sup>12</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

<sup>13</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)



Figure 13: Household Size Distribution - City and Region - 2011<sup>14</sup>



Average household sizes in the Region are larger than the City due to a higher proportion of larger households in the region and a high proportion of 1-person households in the City. In both cases, household size continues to slowly decline.

### Household Income

Household income is the annual gross income (before taxes) of all members of the household. Household income has a strong influence on travel behaviour and it is useful to understand the income distribution in the Calgary Region. This report contains information on income trends observed in CARTAS only because income information in previous surveys need significant adjustment in order to account for inflation. Detail information on household income will be provided in a subsequent report.

The Calgary Region is an area of relatively higher household income as 38% of Study Area household have a household income higher than \$100,000 and 13% had a household income lower than \$30,000. This is compared to households across Canada<sup>15</sup> where 19% of households have incomes higher than \$100,000 and 26% of households have an income lower than \$30,000. The Region has higher incomes than the City with 50% of Region households having an income higher than \$100,000 compared to 36% in The City.

<sup>14</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

<sup>15</sup> (Statistics Canada, 2011)

Figure 14: 2011 Study Area Income Distribution<sup>16</sup>

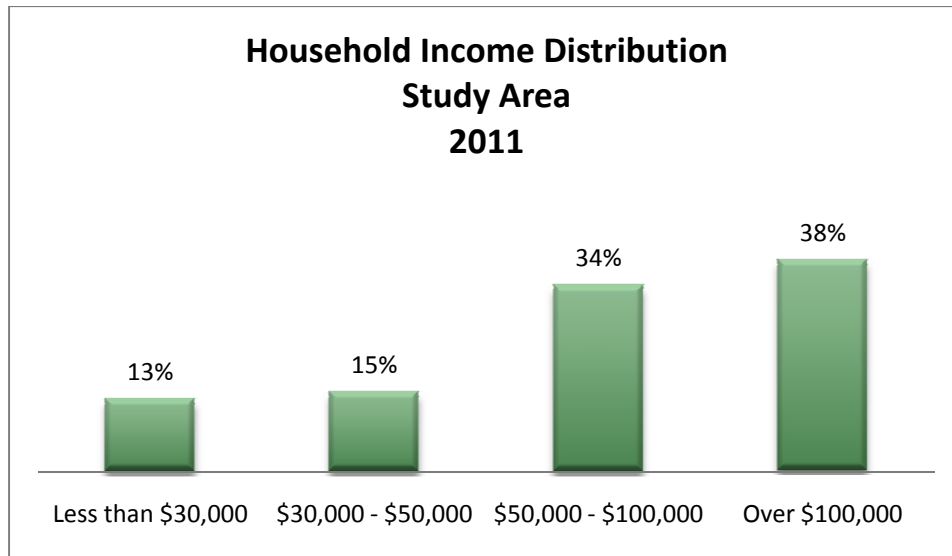
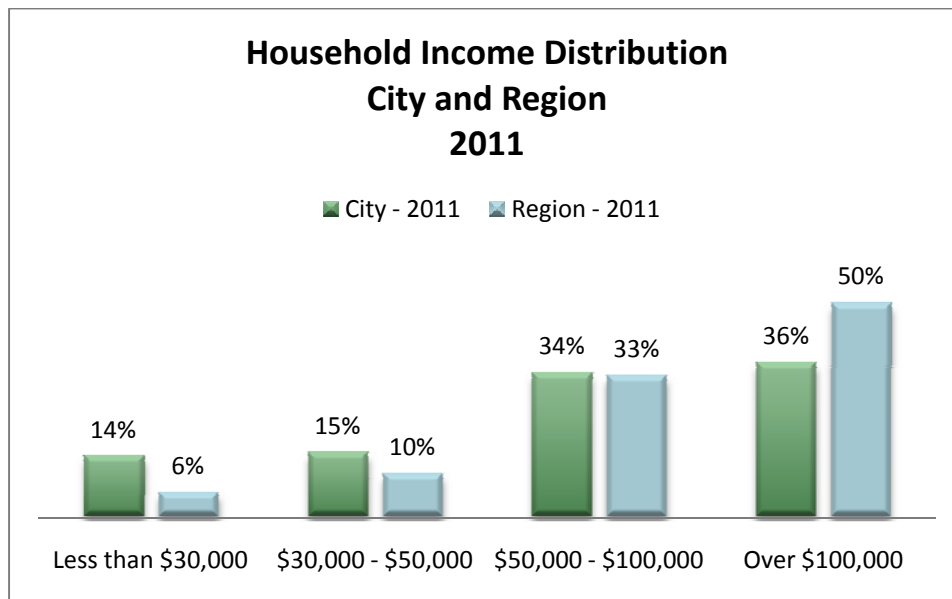


Figure 15: Household Income Distribution - City and Region - 2011<sup>17</sup>



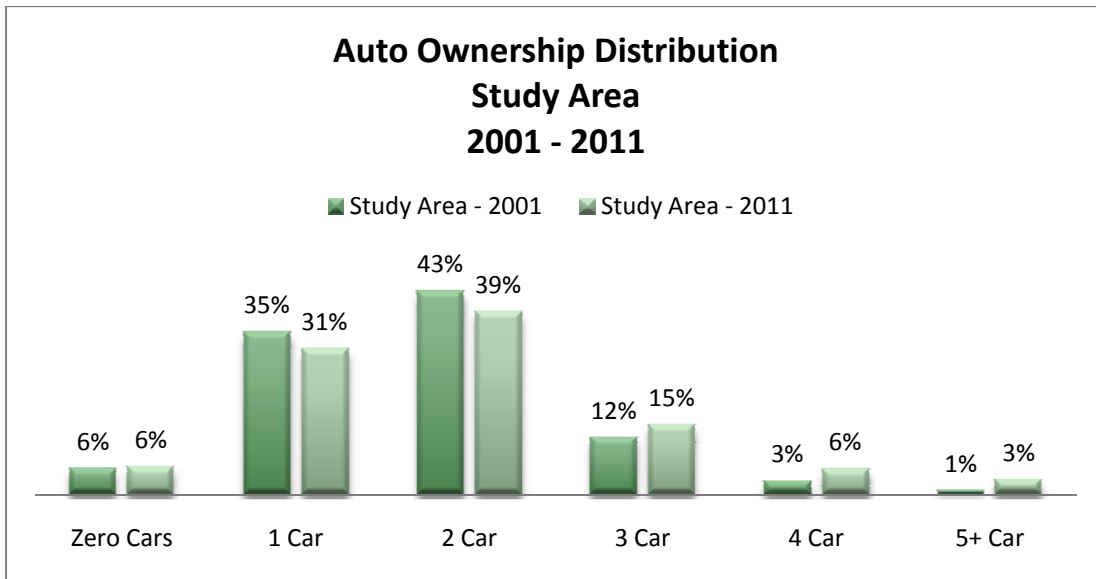
### Household Auto Ownership

Household auto ownership is the number of vehicles owned by each household and strongly influences travel choices that are available to members of the household. In the Study Area, the auto ownership rates (average number of cars per household) have increased from 1.75 vehicles per household in 2001 to 1.95 vehicles per household despite minimal changes in household size.

<sup>16</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

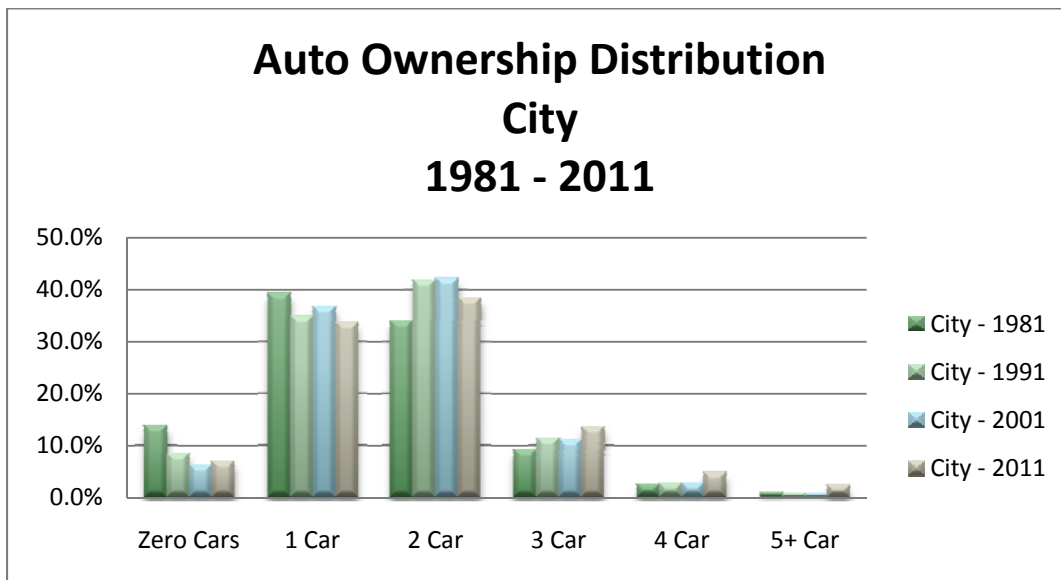
<sup>17</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

Figure 16: Auto Ownership Distribution - Study Area - 2001 - 2011<sup>18</sup>



In 2011, City households own an average of 1.85 vehicles per household which is an increase from an auto ownership rate of 1.50 in 1981. The proportion of households who owned zero cars has increased from 6% in 2001 to 7% in 2011. The proportion of Calgary households who own 3 or more vehicles has increased from 15% in 1981 to 21% in 2011 .

Figure 17: Auto Ownership Distribution - City - 1981 - 2011<sup>19</sup>



<sup>18</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

<sup>19</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

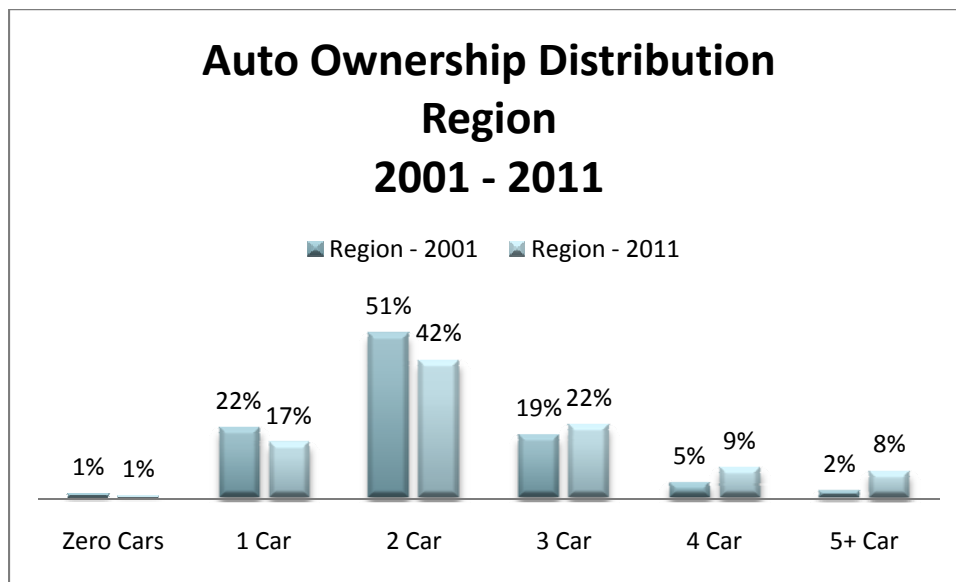
Table 5: Auto Ownership - City - 1981 - 2011<sup>20</sup>

#Vehicles per household	1981		1991		2001		2011	
	#	%	#	%	#	%	#	%
<b>Zero Cars</b>	29,600	14%	22,300	8%	20,700	6%	29,200	7%
<b>1Car</b>	84,000	39%	92,800	35%	121,900	37%	142,100	34%
<b>2Car</b>	72,700	34%	111,400	42%	140,600	42%	162,300	38%
<b>3Car</b>	19,700	9%	30,300	11%	37,100	11%	57,700	14%
<b>4Car</b>	5,400	3%	7,200	3%	9,300	3%	20,700	5%
<b>5+Car</b>	2,000	1%	1,900	1%	2,400	1%	10,200	2%
<b>Total</b>	213,400		266,000		332,000		422,100	

Auto ownership rates in the Region are higher than the City. In 2011, the proportion of households who own 3 or more vehicles has increased to 40%, compared with 21% of City households. Also the proportion of zero car households is 1% in the Region compared to 7% in the City.

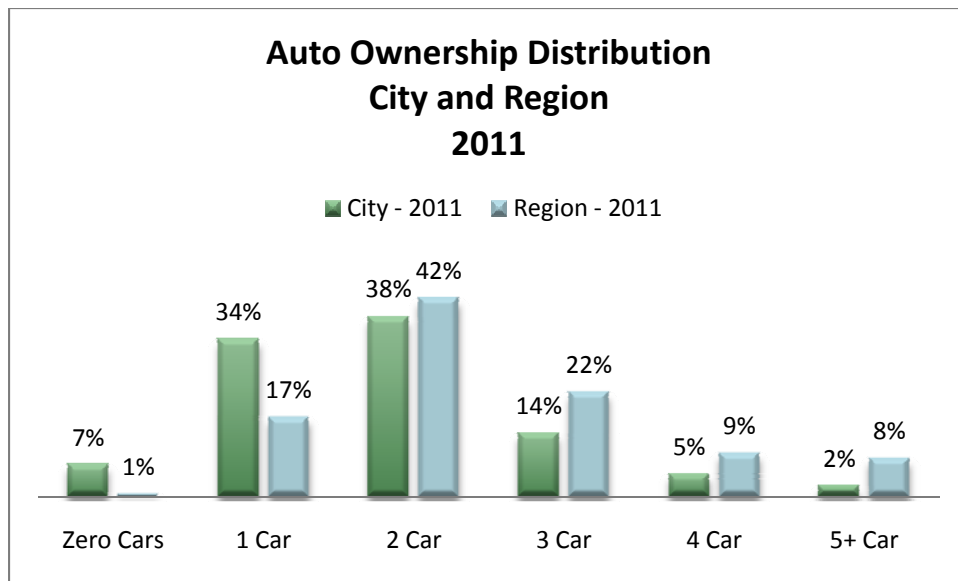
Additionally, auto ownership rates in the Region are higher in 2011 than in 2001. In 2001, 26% of households owned 3 or more vehicles compared to 40% in 2011.

Figure 18: Auto Ownership Distribution - Region - 2001 - 2011<sup>21</sup>



<sup>20</sup> (City of Calgary Transportation Department, 1993), (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

<sup>21</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

Figure 19: Auto Ownership Distribution - City and - Region 2011<sup>22</sup>

## Changing Weekday Travel Behaviour

The key elements of travel behaviour are the specific trips that people make and the characteristics of those trips. These characteristics can include how people travelled, what time of day they travelled, who they travelled with, where they parked their car, whether or not they changed travel mode, and any costs they may have incurred to travel. This section will focus on Study Area trip rates and mode split for City residents. Additional travel information will be available in subsequent reports.

This report contains information on weekday travel only. Weekend travel information will be available in late 2013.

## Weekday Trip Rates

In CARTAS each household member completed a travel diary and recorded each place they went to in a 24 hour period. Travel between places is considered a trip. In some cases, for example transit trips, places need to be linked together because the walk to the bus stop is not considered an independent trip, it is part of the overall transit trip. Trips rates are calculated by using the expanded number of trips observed and dividing it by either the number of people or number of households depending on whether it is a person trip rate or a household trip rate.

In the Study Area, average trip rates per person have decreased from 3.75 trips per person in 2001 to 3.66 in 2011 and average household trip rates have decreased from 10.01 to 9.59 in 2011. Trip rates per person in The City have decreased from 3.81 in 2001 to 3.67 in 2011 while Region trip rates have increased from 3.38 trips per person to 3.62 trips per person.

<sup>22</sup> (City of Calgary Transportation Department, 2012)

Figure 20: Average Person Trip Rates - Study Area – 2001 - 2011<sup>23</sup>

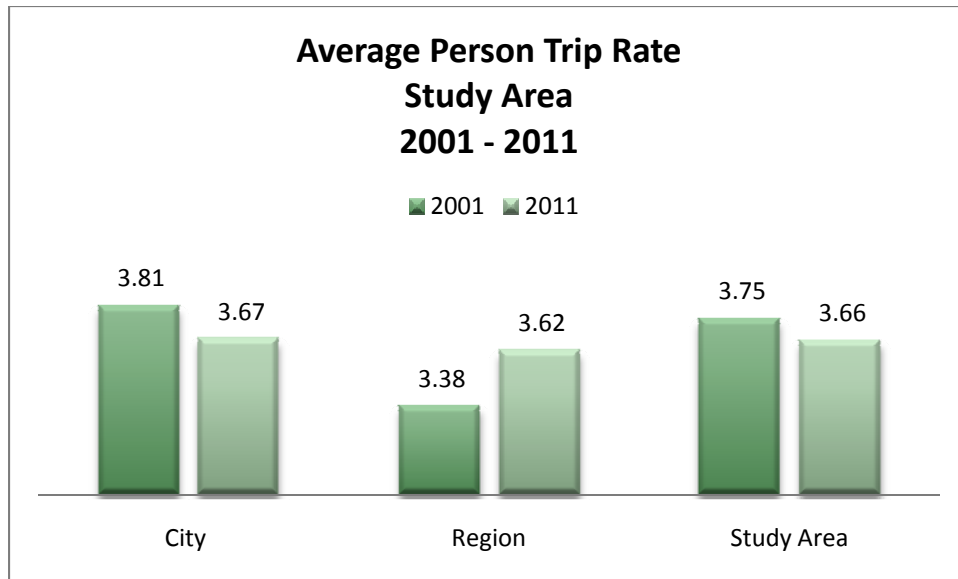
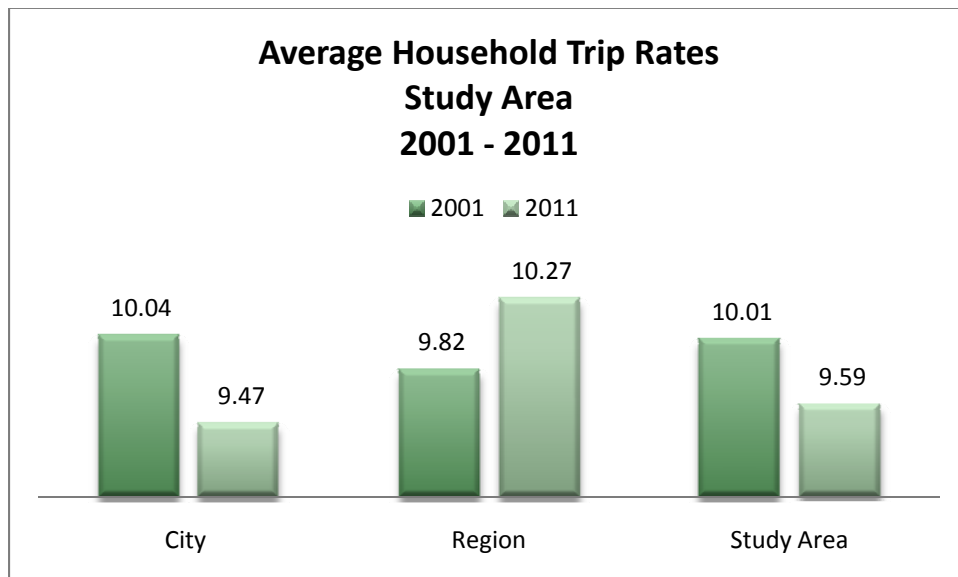


Figure 21: Average Household Trip Rates - Study Area – 2001 - 2011<sup>24</sup>

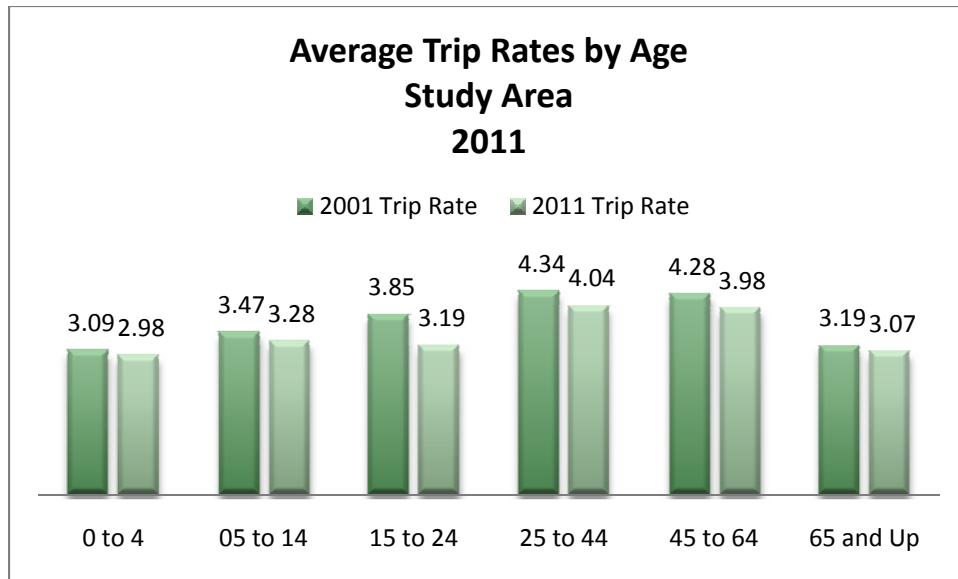


Trip rates can also differ by age and gender. In The City the differences between the trip rates of females and males is minimal. The age of the person travelling is an indicator of the number of trips they make. The highest trip rates are seen in people aged 25-44 for both genders while the lowest trip rates for adults are in people 65 years of age or older.

<sup>23</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

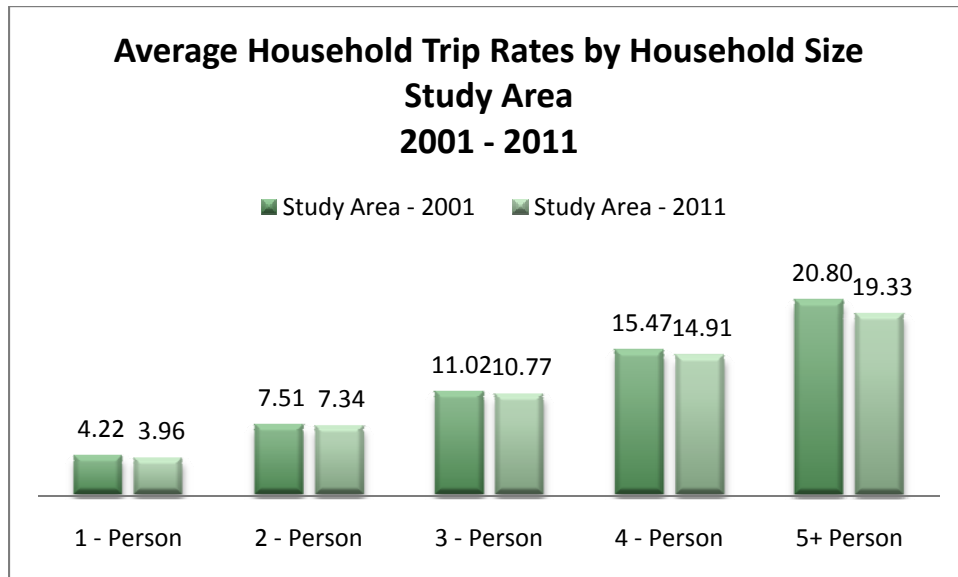
<sup>24</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

Figure 22: Average Trip Rates by Age and Genders – Study Area - 2011<sup>25</sup>



Household size also impacts trip rates. Larger households make more trips and thus have a higher trip rate than smaller households. The same is true for household auto ownership and income. Higher auto ownership rates and household income result in more trips being made by households.

Figure 23: Average Household Trip Rates by Household Size - Study Area - 2001 - 2011<sup>26</sup>



<sup>25</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

<sup>26</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

Figure 24: Average Household Trip Rates by Auto Ownership - Study Area - 2001 - 2011<sup>27</sup>

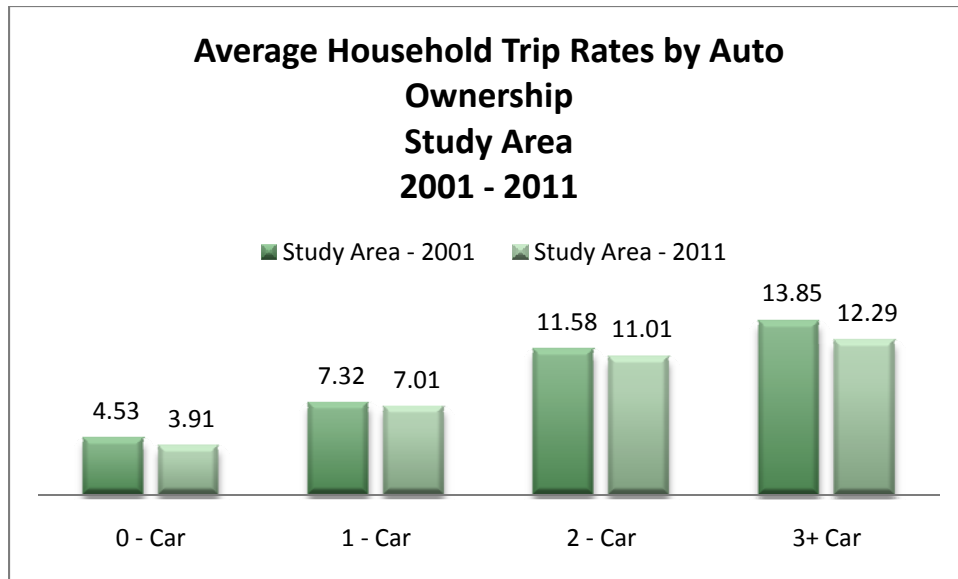
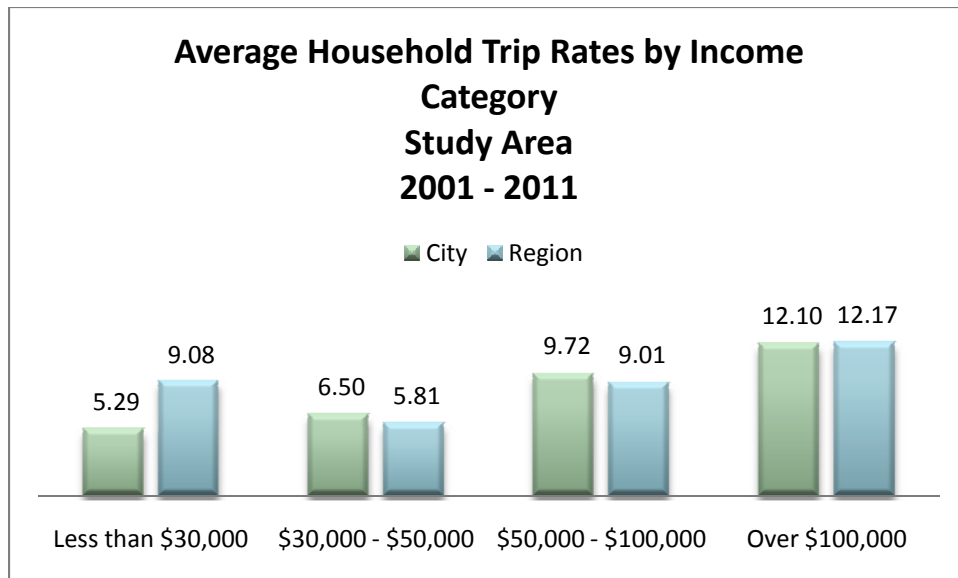


Figure 25: Average Household Trip Rate by Income Category - Study Area - 2011



### Weekday Mode Share by City Residents

The Calgary Transportation Plan (CTP), approved in 2009, contains a series of indicators that are designed to measure progress towards CTP goals. One indicator that can be observed from a household travel survey is Indicator 10: Transportation Mode Split.

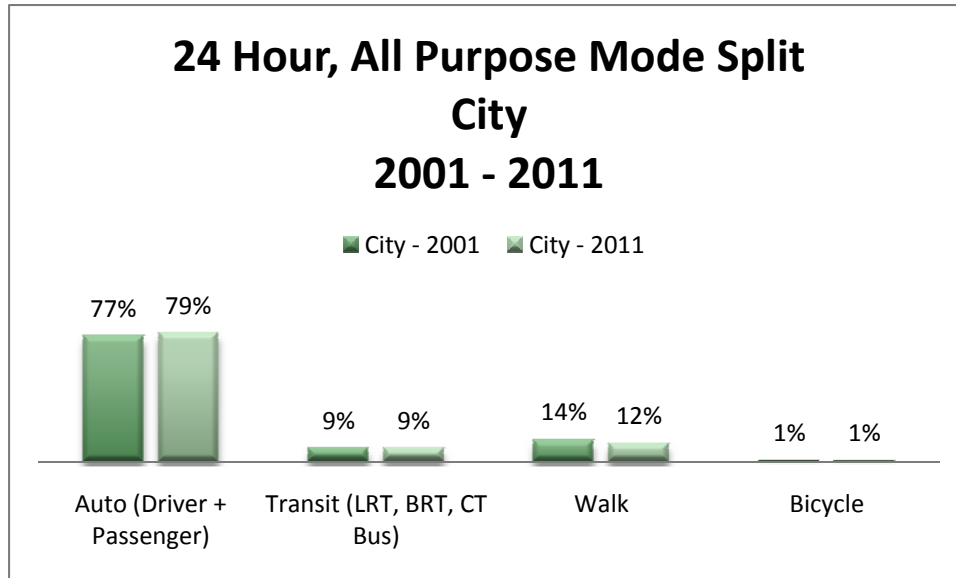
The auto mode share includes trips made by auto drivers, auto passengers, and other motorized modes of private transportation such as motorcycles. In 2001, 77% of all day, all purpose travel was by auto.

<sup>27</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)



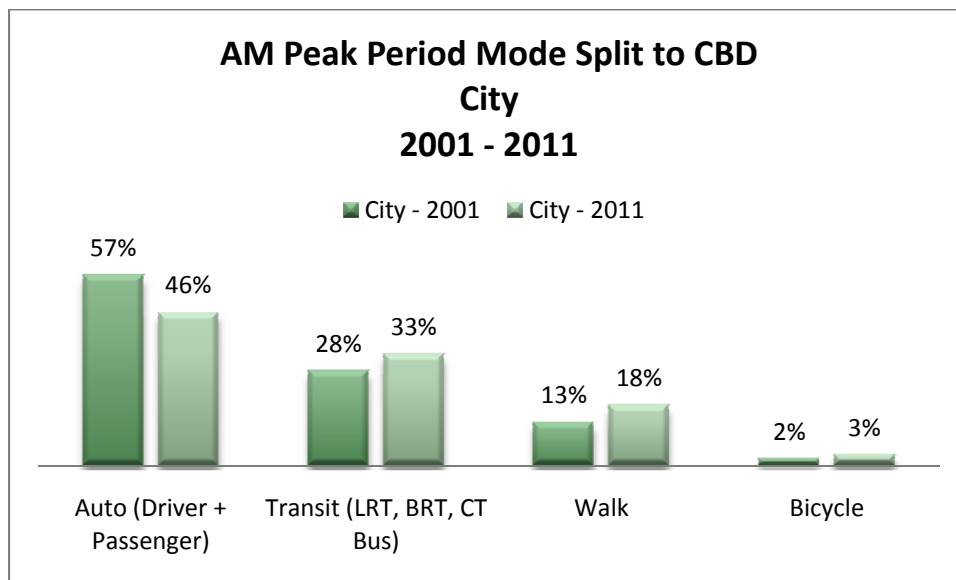
This share increased to 79% in 2011. Transit mode share has not changed significantly since 2001 and remains at 9%. Walk and bike mode share decreased from 14% in 2001 to 12% in 2011.

Figure 26: 24 Hour, All Purpose Mode Split - City - 2001 - 2011<sup>28</sup>



In the AM Peak Period, weekdays from 6am to 9am), the transit mode share has increase from 28% in 2001 to 33% in 2011. The walk mode share has also increased from 13% to 18% and the auto mode share has decreased from 57% to 46%. This is likely due to the infrastructure investment in transit and pedestrian facilities to improve access to downtown by transit and walking modes.

Figure 27: AM Peak Period Mode Split to CBD - City - 2001 - 2011<sup>29</sup>



<sup>28</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

<sup>29</sup> (The City of Calgary Planning & Transportation Policy, 2001), (City of Calgary Transportation Department, 2012)

The City of Calgary conducts an annual downtown cordon count which counts all pedestrians, cyclists, transit passengers, and vehicle passengers that enter and exit the downtown area. This results from this study are different from what was reported in CARTAS. The differences are due to differences in the study area, and study methodologies.

The cordon study counts people as they cross the boundary in to Downtown only and does not include the Beltline. The counts do not necessarily represent specific trips or trips with destinations to the downtown. For example, people travelling from South Calgary to the University would get counted as they entered Downtown as inbound trips and counted again when they were leaving Downtown as outbound trips even though none of them began or ended their trips Downtown.

The survey data is reporting trips to destinations in the Downtown and Beltline. People travelling to from South Calgary to the University would not be included in AM CBD mode split calculation. Both studies indicate increases in transit and walking mode share so while the specific numbers are different due to the differences in methodologies, they both support the same conclusion.

## Survey Methodology

### Survey Methodology and Process

The City of Calgary retained a policy research consulting firm, NuStats, through an open, competitive, qualification based Request for Proposal Process. The consultants role was to assist and collaborate with city staff to design, test and implement the survey. Two test surveys were conducted, one in February 2011 and one in November 2011. The purpose of the test surveys was to run the survey on a reduced sample to test the processes and procedures and then make final adjustments for the full survey. The full survey ran from January to May 2012.

Sampled households were mailed an advance brochure that provided information on the purpose of the study and how households could participate. Households could choose to participate through a web-based survey tool or a computer assisted telephone interview (CATI). At this stage, households provided demographic and socio-economic information. Households were assigned a travel day where they would record their travel and activities for a 24 hour period. After their travel day, households could choose to enter the information through the web-based survey tool, the telephone, or they could mail the survey back to the consultants who would enter and process the data.

A detailed description of the survey methodology can be found in the “Calgary and Region: Travel and Activity Survey Final Report” located on the travel surveys website ([www.calgary.ca/travelsurveys](http://www.calgary.ca/travelsurveys)). Please note that the results presented in the survey methodology report are raw outputs and the results in the methodology report will differ from the results presented in this report.

### Survey Response Rates

In CARTAS, over 200,000 households were contacted either by mail or by telephone to participate in the survey and 13,770 households were recruited to participate. The web-based survey tool was effective as 48% of households completed the recruitment interview using the web which is significantly higher

than web response in other jurisdictions. The remainder were recruited through a Computer Assisted Telephone Interview (CATI). This represents a recruitment rate of 5.2%. After their travel day, households could submit their travel diary information through the web-based survey tool, by mailing back their completed diaries to the consultant, or by telephone. A total of 9,015 households submitted completed surveys representing a retrieval rate of 65.5%.

Table 6: CARTAS Response Rates

Geography	Recruitment Rate	Retrieval Rate	Final Response Rate
City of Calgary	5.3%	65.7%	3.5%
Region	4.9%	63.2%	3.1%
<b>Total</b>	5.2%	65.5%	3.4%

Table 7: CARTAS Recruitment and Retrieval Mode

	Recruitment		Retrieval	
	#	%	#	%
<b>Telephone</b>	7,133	51.8%	2,178	24.2%
<b>Web</b>	6,637	48.2%	3,141	34.8%
<b>Mail</b>	N/A		3,696	41.0%
<b>Total</b>	13,770		9,015	

## Expansion

CARTAS was a voluntary, sample survey which means the information was gathered from a sample of the population and then expanded, or factored up, to represent the full population of the Calgary Region. A separate expansion factor was developed for each household in the survey so that the expanded population met a series of targets that match the actual population. This ensures the sample population matches the real world across a number of variables including: population, income, number of households, household size, and age by geographic area.

On average a household would have an expansion factor of 50 (2% sample) and by matching these targets some households are weighted higher or lower depending on how many households have similar characteristics. Households that are over-represented would have an expansion factor of less than 50 and household that are under-represented would have an expansion factor higher than 50. The result is an expanded survey that matches the real world population and ensures the travel behaviour results can be used with confidence. For example, in CARTAS, 16% of the households had 4 or 5 people living in the household, but census results indicate that 22% of household have 4 or 5 occupants. To ensure the survey distribution matches the census distribution, 4 or 5 person households will have a higher expansion factor to account for this under representation.

The expansion targets used in this survey were obtained from the 2011 Civic Census, the 2011 Census of Canada, and the 2006 Census of Canada. 2011 Census of Canada data for household income was not available at the time of this report. The Household Income targets were developed using distributions

from the 2006 Census of Canada. The survey expansion was conducted with these preliminary targets so the Regional Transportation Update Program can continue. The targets will be updated later in 2013 when new census information is available.

## Conclusions

CARTAS offers a unique perspective into travel decisions that are made by study area residents as well as the different factors that influence their decisions. However, the true value of this survey comes from comparing back, where possible, to previous surveys that have been conducted. The City has been conducting household travel surveys approximately every 10 years since 1964, and CARTAS provides an opportunity to look at how we have change over time.

To fully examine the changes in travel behaviour, a series of reports will be developed to investigate how travel has changed since 1981. These reports will be release approximately once per quarter in 2012 and will cover a wide variety of transportation related topics such as how people are travelling, where they are going, when they are travelling, as well as an in-depth analysis into particular travel modes. The reports will be released on the Travel Surveys website at [www.calgary.ca/travelsurveys](http://www.calgary.ca/travelsurveys).

## Appendix A – Glossary of Terms

## Glossary of Terms

Term	Definition
<b>24 Hour Trips</b>	All trips that occurred in one day from 00:00 to 23:59
<b>All Purpose Trips</b>	Trips that are made for any purposes which may include work, school, shopping, pick up/drop off etc.
<b>Auto Ownership</b>	The number of cars, pick up trucks, SUVs, or motorcycles owned by a household. Does not include recreation vehicles, commercial vehicles or vehicles that are not operational
<b>Average Household Size</b>	The average number of people who live in the same household and share a kitchen.
<b>Calgary Area</b>	The City of Calgary and the surrounding Region. (See Region below)
<b>CATI</b>	Computer Aided Telephone Interview is a process used by survey companies to collect information from survey respondents over the telephone to ensure high quality data.
<b>CBD</b>	Central Business District
<b>Census of Canada</b>	A survey of all Canadians that is conducted by Statistics Canada every 5 years.
<b>Central Business District</b>	In Calgary, and for the purposes of this report this is the central area of the city bounded by the Bow River on the North and East, 17 Avenue to the South, and Bow Trail to the West.
<b>City</b>	Area located within the 2012 City of Calgary boundary.
<b>Civic Census</b>	An annual survey of all residents in Calgary conducted by The City of Calgary.
<b>Cordon Study</b>	A study that counts vehicles, bikes, and pedestrians as they cross a particular boundary.
<b>CTP / MDP</b>	The Calgary Transportation Plan and Municipal Development Plan approved by Calgary City Council in 2009.
<b>Dataset</b>	A collection of data, usually presented in tabular form, where each column represents a particular variable.
<b>Demographics</b>	Statistical data relating to the population and particular groups within it such as household size, income, age, and gender.
<b>Downtown</b>	The same area as the Central Business District
<b>Employment</b>	The number of people who are employed in an area.

<b>Established Communities</b>	Residential communities that were planned and developed between the 1950s and 1990s. They are primarily residential communities containing a mix of low- and medium-density housing with support retail in relatively close proximity as defined in the Municipal Development Plan.
<b>Expanded Survey Results</b>	Results obtained from the survey using expansion factors developed from demographic targets
<b>Expansion Factor</b>	Weighting factor developed from demographic targets so the survey distributions match the actual population distributions.
<b>Greenfield Communities</b>	Residential communities that have been planned since the 1990s and are still being developed as defined in the Municipal Development Plan.
<b>Household Income</b>	Total annual pre-tax income for all members of the household.
<b>Household Size</b>	The number of people that live at an address and share a kitchen.
<b>Household Travel Survey</b>	Survey to collect information from households describing their travel choices and travel influences.
<b>Income</b>	See Household Income
<b>Industrial Area</b>	Areas that include a broad variety of industrial uses and intensities that support business in Calgary as defined in the Municipal Development Plan..
<b>Inner City</b>	Residential communities that were primarily subdivided and developed prior to the 1950s as defined in the Municipal Development Plan..
<b>Jobs Per Capita</b>	The number of employed people divided by the total population.
<b>Migration</b>	Population increase or decrease due to people moving into or out of the Calgary Area.
<b>Mode Share</b>	The percentage of trips that are made by different travel modes.
<b>Mode Split</b>	The percentage of trips that are made by different travel modes.
<b>New Communities</b>	Residential communities that have been planned since the 1990s and are still being developed as defined in the Municipal Development Plan..
<b>Peak Periods</b>	Periods where travel demand in the study area is highest. Typically there is a peak in the morning from 6:00AM to 9:00AM and in the afternoon from 3:00PM to 6:00PM.
<b>Place of Work Survey</b>	Survey conducted in conjunction with the Civic Census that collects employment information

	including the work location, industry, and occupation.
<b>Population</b>	The number of people living in an area.
<b>Region</b>	The area surrounding the City of Calgary that includes the MD of Foothills, Rockyview County, Wheatland County. It also includes and all the towns and villages within that area such as Airdrie, Chestermere, Cochrane, Okotoks, Strathmore, and High River.
<b>Regional Transportation Model</b>	Computer simulation of the city and surrounding region that is used to support transportation and land use decisions.
<b>RTM</b>	See “Regional Transportation Model”
<b>Sample</b>	A set of data collected and/or selected from a population by a defined procedure.
<b>Statistically Significant</b>	A statistical assessment of whether observations reflect a pattern rather than just chance.
<b>Study Area</b>	Includes The City of Calgary and the surrounding Region. (See Region above).
<b>Travel Mode</b>	Different methods of travelling about the Study Area. Includes walk, bike, transit, and auto.
<b>Trip</b>	Travel between two points by any mode. In cases of transit trips where the travel mode changed between two points, such as a park and ride trip or a walk to the bus stop, the trips were linked together to form one transit trip.
<b>Trip Distance</b>	The distance travelled on the road network when going between two points.
<b>Trip Purpose</b>	The reason the trip was made and includes, work, school, shopping, etc and is primarily defined by the destination purpose unless otherwise specified.
<b>Trip Rate</b>	The number of trips made per person or per household.
<b>Vehicle Kilometres Travelled</b>	The total number of kilometres travelled by all vehicles on the road network.
<b>Vehicle Kilometres Travelled per Capita</b>	The total number of kilometres travelled by all vehicles on the road network divided by total population.



## Appendix B – References

## Bibliography

City of Calgary City Clerk's Office. (2001, April). *2001 Civic Census*. Retrieved January 2013

City of Calgary City Clerk's Office. (2011, April). *2011 Civic Census Results*. Retrieved January 2013

City of Calgary Transportation Department. (2012, May). *2012 Calgary and Region Travel and Activity Survey Database*. Retrieved January 2013

City of Calgary Transportation Department. (1993). *A Comparison of Travel Behaviour in Calgary: 1971 to 1991*. Calgary.

City of Calgary Transportation Department. (1981). *Calgary Transportation Study Comparison of Travel Behaviour 1971 to 1981*. Calgary.

Statistics Canada. (2001). *2001 Census of Canada*. Retrieved January 2013

Statistics Canada. (2011). *2011 Census of Canada*. Retrieved January 2013

The City of Calgary Planning & Transportation Policy. (2001, November). *2001 Household Activity Survey Database*. Retrieved January 2013